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AN

+ ILLUSTRATED + WEEKLY + MAGAZINE +

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,  
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

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This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some faint horizontal lines and minor discoloration or foxing. The right edge of the page is bound into a dark, textured material, possibly leather or a heavy cloth, which is visible as a vertical strip on the right side of the frame. The overall lighting is even, highlighting the subtle variations in the paper's tone.

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## Honesty as an Architectural Virtue.



PERFECT flock of hints, suggestions, counsels, lamentations, warnings, hopes, and fears have recently overshadowed the horizon of architectural study, which it may be of some service

to our readers to trace to their native rookery. In one place we are promised the gratification of the "sitting" of ornamental façades on to useful practical buildings, which must, therefore, naturally be supposed to have but a mean and unexpressive physiognomy of their own. In another we are told of the disjunction which must be effected between the science and the art of architecture. The idea which underlies not only these utterances, but the general opinion of the mass of those who trouble themselves to think on the subject, is, that there is an essential difference between structural and pictorial beauty; and it is as tending to throw a full light on this very mischievous error that we ask for attention to a few words on the much misrepresented virtue of Honesty.

In the abstract, and apart from that special form of the virtue which is essential to the character of a great architect, the name of Honesty is perhaps more abused than that of any other ethical or intellectual virtue. It is applied as the cloak of ignorance, as the apology for bad manners, or even for worse purposes. The man who, without regard to time, place, or company, gratifies his vanity by blurring out his ornate notions on any possible subject, is too often called an honest fellow. In fact, he is only so ill-bred and so ignorant as to be supposed incapable of deceit. That may be so, or not. We have known cases,—and no doubt some will recur to the memories of most of our readers,—in which a man may be held to have purposely adopted the disguise of incivility, have lived for years under the title of "Honest Tom Speak-forth," and at length, generally too late for human

retribution, have been discovered to have left behind him only an unexplained deficit, or sometimes an equally unexplained family of children. The honesty which causes this kind of pitying or even of affectionate regard is simply that, so far as it exists at all, of not telling lies; or rather of not putting matters in such a light as may be most agreeable to the sympathies of others.

This kind of honesty is sometimes applied to building. A man will declaim against the importance of stucco, and will give you hideous brickwork in place of it. "Honest brick and mortar," he calls it. But he omits to mention two points. One, that the imperfections of English stucco are mainly due to the very rude and imperfect way in which we treat our lime. Those who are most familiar with the use made of this material in Italy, from scagliola work to the preparation for fresco painting, will be aware that this is the case. Secondly, while there is a real beauty in brickwork, it requires so much care in the selection of clay, and in the making, burning, and laying of bricks, to insure it, that noble brickwork is almost a lost art in England. Our honest friend, therefore, only gives the cheapest and meanest material that comes to hand, and excuses that slovenliness of his work by calling it "honest."

If mere want of disguise, or of decency of clothing, be thus unworthy of the name of honesty, what, it may be asked, is the true definition of that virtue; a quality which, in fact, we take to be closely akin to what Mr. Ruskin means by the "lamp of truth"?

True honesty we take to be a native instinct of duty, worthily and unweariedly called into exercise. Its first action is reflective, inward, formative of character. Applying this definition to the architect, it is easy to see that such a virtue is the very fountain of excellence. For that instinct of duty will leave the owner no rest until his work is the best that his knowledge, his skill, and his opportunities will allow. Not only so, but his conscience will not allow him to pretermitt any possible means or occasion, either of improving his own knowledge and skill, or of making more and more of his opportunities. Such a principle is the very spring of artistic and scientific growth. The man who is in this sense honest, will never be wholly satisfied with

his own work. "I took very great pains," he may say, "and, indeed, I think I overcame no small amount of difficulty, but if I had to do it over again, with my previous experience, I could do something better." Before a vital and energetic honesty of this kind, all those mists and vapours of which we have spoken as veiling the relations of structure and of ornament must in due time disappear.

For the thoroughly honest architect will be content with no perfunctory work. While, on the one hand, he will scorn the temptation to filch an elevation here, a detail there, a dodge in a third place, he will equally avoid the idle vanity of endeavouring, more Germanico, to project his work from his inner consciousness. Whatever be the magnitude of his task, honesty will impel him not only to give to it mature consideration, but to throw on that consideration all the light that is accessible from experience. Thus, if it be the case of a public building, the honest architect will not only study site, purpose, accessible materials, harmony of pictorial effect with surroundings, and the like, but he will be entirely unsatisfied until he has learned how the like requirements have been met, in any similar cases, by the greatest masters of his art. It is only when thus fully informed that he will allow the wing to his own imagination. A flight thus prepared will be sure to strike the quarry.

Precisely the same sort of study is required as to the relations of structural and of pictorial beauty. If it be possible to draw a line between the two, we should draw it between form and colour; but colour is rarely very much at the choice of the architect. In nature we see the most pompous and gorgeous displays of colour accompanying the most vague and uncertain forms, as in the hues of the sunrise or sunset. That is something apart from any structural art; it is not attainable by any imitation within the powers of the architect or of the sculptor, and but very feebly by the painter. Colour, with the architect, is usually imposed on him by the choice of materials. He may call in rich marbles, nobly stained windows, painted walls and ceilings, for purely decorative purposes, when motive demands and when funds allow; but these are but subservient to his true art.



We are very much inclined to hold, first, that all true architectural ornament is that of form; and, secondly, that all excellent architectural ornament has its origin in structural reasons or in order to emphasise them. Such, there is no doubt, is the case with all the exquisite forms of pure Grecian architecture; such, to a great extent, is the case with Gothic design. We may make one exception in the case of foliated decoration, but even in that, the idea of structure is not wholly absent. In those parts of Italy where the building stone is so soft and homogeneous in its nature as to tempt the sculptor to indulge his fancy, a wreath of foliage may be cast over a lintel, or twined round some architectural feature; but such an adornment is never found without a motive; we never see a bit of exquisite sculpture stuck against a blank unmeaning space. This kind of decoration rather springs from the habit of decking temples and shrines with flowers and foliage on festal occasions, a simple adornment of the structure which the natural instinct of the sculptor has led him to perpetuate in stone.

With this idea of the genesis of true architectural ornament before us, the idea of the disjunction of the structural and of the ornamental is at once seen to be incorrect. And here it is well to note, that it is very easy to be misguided by a false analogy drawn from organic life. If we take the most beautiful of the works of Nature, a beautiful human form, we find a wonderful economy to be displayed in the disposition of the structural and of the pictorial elements. The skeleton, highly scientific as it is in its structure, has not had a single decorative gift bestowed upon it. If we look at the joints, for example, while they show the most admirable adaptation of material to obtain the maxima of strength, mobility in the required direction and in no other, and lightness (often conflicting requisites), we find no attention given to elegance of curve. In point of fact we think that the skeleton is a very ugly structure. But beauty would have been wasted here, except in the direction of linear proportion, and in that, in the most perfect forms, precisely this element of beauty is conspicuous. For a structure that was to be imbedded in muscles, covered with a flowing contour of dainty flesh, robed in a brilliant skin, and adorned by a decorative veil more beautiful than any but the most exquisite feathers, the study of elegant curves of outline would have been thrown away. Nay, more, it would have been injurious. To give graceful curves to the bones of the skeleton would more than double their weight.

The reverse of this is the case with the work of the architect. His problem is more simple. He has not to provide for motion. Lightness is not so much an object with him as the reverse. He requires weight enough to enable his structures to remain unmoved, whatever be the pressure of the inmates on the floors, or that of the storm on the walls and roof. Again, his structure is, or should be, homogeneous. He has not to cover his skeleton with a second order of material, destined for motor purposes. There are no muscles in architecture; and if there be a skin, it is only in order to veil the use of an ignoble material for the bones. It is rather to the carapace of the turtle, or the jointed armour of the fish of the earliest seas, than to any other example afforded by the animal world, that the architect must look for illustration of the way in which rib is made to spread out into wall. The work of the architect is all either skeleton or shell, and the skeleton, far from demanding to be hidden, furnishes, if adequately treated, the most exquisite kind of decoration. What are the flying ribs in Gloucester Cathedral but an illustration of this? Under guidance of this class of ideas our great church-builders gradually modified the style of English architecture from walls pierced by the double-arched windows of the Saxon times, made so small as to keep out any sacrilegious assailant of a church, to the mulioned and transomed windows that filled the whole end of a nave, as in the west window of Tewkesbury Abbey. Not only so; they overrode their task, reversing the true principles of art, as when, in the wonderful roofs of Westminster, Windsor, and King's College, Cambridge, they made the shafts which should support the ribs hang as pendants over the astonished gazer. To borrow a well-known phrase, this is magnificent, but it is not architecture. In their endeavour to surprise the beholder, these great artificers departed from structural honesty. And so came the descent into garbled roofs,

and so on, down to the churchwarden style of decoration.

That honesty which, when sumptuous decoration is appropriate, will not attempt to introduce it except as a development of true architectural motive, will, at all events, steer clear of the meretricious and of the absurd. The same lamp of truth will guide the architect safely through all his difficulties. For each new difficulty will, in its turn, become a new teacher. The organic unity of his work will be the daily study, if not the nightly dream, of the honest architect. In proportion as his conception of his duty is more noble and more enlightened, will the honesty of his soul be reflected in his work. And in proportion as this is the case will persons who have no claim to the mastery of either science or art find silence imposed upon them when they prate about the opposition of the two.

#### MR. WATTS'S PICTURES AT THE GROSVENOR GALLERY.

It was an admirable idea to make the Grosvenor Gallery Winter Exhibition the means of exhibiting the collected works of a great modern painter. Considering the drain made upon the resources of the nation in regard to old painters, by the exhibitions at Burlington House, it would have been difficult for another Gallery to have kept pace with the Academy, year after year, in the same style of loan exhibition; but independently of this, it is certainly worth while to show to the public, collectively, what work a modern artist, of high aims and remarkable powers, has effected during a number of years of devotion to his art. Considering the place held by Mr. Watts in modern ideal art, and the special tendencies of the Grosvenor Gallery exhibitions, it was almost inevitable that he first should be illustrated in this manner. But we would hope that the idea thus inaugurated will not stop here, and that in future years other English artists of note will thus be brought before the public in their collected works.

The paintings, over 200 in number, thus brought together present a somewhat strange mingling of subjects, illustrating both the real and the ideal in art. In regard to style there is less dissimilarity. There may be said to be two styles shown here; the one, illustrated by such paintings as "The Sisters" (99) and "Lady Holland" (1), marked by rather strong, and, in comparison with the artist's later style, crude colouring; and the later and special style of the artist, which is by far the more largely illustrated, and is characterised by very delicate and yet warm and rich colour-harmonies, in which sometimes we cannot but feel that force and clearness of definition are somewhat sacrificed in the effort to obtain a perfectly harmonious blending of the colour-element of the painting. There are some works in which the balance is perfect; pre-eminently amongst these is the "Daphne," which now makes its second appearance in the Grosvenor Gallery, and which, in point of execution and of the complete realising of an ideal, seems to us Mr. Watts's most perfect work. Here there is no over-refinement, no lack of clear definition and robustness of form; the colour and texture of the figure are just sufficiently removed from realism to obviate any idea of its being a mere "nude study," and to shed over it the halo of poetry, and present it to us as a beautiful ideal conception, based on the study of nature, yet suggesting something beyond the mere physical form of a beautiful woman; it is a classic dream, realised as only a painter combining great manipulative experience with true poetic feeling could realise such a subject.

We by no means say that this is the highest in aim, or the most powerful in effect, of the works here exhibited; but it is the most complete, and the reason why it is so throws some light on the causes of the less satisfactory result of some other works which aim still higher. The "Daphne," though essentially an ideal work, attempts nothing beyond what painting can succeed in giving. Some of the other subjects in the room fail in effect from the attempt to render in painting what could hardly be rendered but in words, and even then but vaguely and inadequately. There are a considerable number of paintings here, mostly large ones, in which the endeavour is to convey, through the medium of painting, moral ideas and allegorical expressions of some of the great spiritual problems of life. It is impossible to deny that some of these illustrate the great

danger of the attempt to convey too subtle and too complicated an intellectual idea through the medium of painting. The very fact of the necessity, evidently felt, of appending to these works a description in the catalogue of the meaning they are intended to convey, and the manner in which that meaning is to be read from the incidents of the painting, is in itself a confession of weakness,—an indication that painting has been made to attempt something more than she can legitimately be called upon to express. If painting is successfully and powerfully to express allegorical meaning, and through it to work on what may be called (in the broadest sense of the word) our moral feeling, there is at least one condition essential: the subject treated must be one of broad and general human interest, and the allegory must be of that simple and straightforward nature that its meaning is readily apparent without elaborated explanations. The one picture among this allegorical class of works of Mr. Watts's which is entirely successful completely fulfils these conditions; that is the painting of "Love and Death," which made its first appearance in the Grosvenor Gallery not very long since. Here the subject is one of universal interest, and the allegory is so simple and obvious that hardly even the title, "Love and Death," is needed to make it fully intelligible. It tells its story at once, and tells it in the most direct and impressive manner possible; and the great heavily-robed figure of Death, its back to the spectator, sweeping slowly but irresistibly to the portal, we do not hesitate to call one of the finest conceptions to be found in the whole range of art,—ancient or modern. But it is very different with some of the other allegorical works. Take the picture which has been before exhibited at the Grosvenor Gallery under the title "Mischievous." It retains that title in the present exhibition (35), but to this is appended a description of the picture, as "a symbolical design, representing the tyranny of earthly love. A stalwart figure, typifying the pride and strength of physical manhood, has been ensnared by Passion, in the guise of Love, and is now held fast amid tangled briars where he thought to find only roses." When we read this, no doubt we may say of the artist, in Sir Hugh Evans's words, "His meaning is good"; but we might just as well put half a dozen other meanings to it, which could equally be made to fit it; and the picture is not particularly beautiful or striking as a composition. "Life's Illusions" (46), a picture of the artist's earlier period, is a still greater puzzle, elucidated by a lengthy description in the catalogue, which, no doubt, enables us to trace out the artist's idea; but without this, all we see is a mass of large female figures entangled together in the upper part of the picture ("the abstract embodiments of divers forms of hope and ambition"), and some figures on a much smaller scale beneath them, hurrying towards a precipice. The "abstract embodiments" are very solid and material young women, and the principal figure of them strongly recalls in style and attitude (not in colour) some of Elty's not very poetical conceptions. The like exception may be taken to "Fata Morgana" (65), a picture painted much later, showing a female figure, which represents "Opportunity," who is only to be caught by the long look of hair flying from her forehead, and is pursued in apparently futile chase by a man in a helmet. "Opportunity" shows a very fine leg and vigorous action, but it is impossible to regard the picture seriously, in reference to its supposed meaning. "Time and Oblivion" (60), though its precise meaning would hardly be apparent on the face of it, is a fine and effective decorative painting, and the head of "Time," treated not as an old man, but as "the personification of stalwart manhood, gifted with imperishable youth," is very grand. There is a fine conception of "Satan" also, a colossal figure, answering the question "Whence comest thou?" while shading his face with his hand from the glory of the celestial light. Both these are new to us, and are undated in the catalogue, but from their style we presume they are comparatively early works. The large unfinished picture of "The Angel of Death" (77) is among those allegorical subjects which are universally intelligible, and has the making of a great work in it, but it is in too incomplete a stage to judge of.

It is needless to say that the portraits exhibited are of great interest, though here also there are very great inequalities. Of those which may be called realistic portraits some



are by no means very successful, even as likenesses. The artist's power in portraiture is best shown in those works in which the object is not merely portraiture, but the production of a fine pictorial effect. The portrait of Sir F. Leighton, which was in the last Academy exhibition, impresses us more here than it did at the Academy; perhaps partly because it is more in keeping with its surroundings. That of "Miss Dorothy Tennant" (93), painted three or four years ago, is an exquisitely refined work, which may, however, come under the class of realistic portraits. It is noticeable especially for the beautiful painting of the flesh tints. The highly characteristic and effective portrait of Miss Cavendish Bentinck we commented on when it appeared in the Grosvenor Gallery not long since. This, though exceedingly striking from a pictorial point of view, is one which does not produce the impression of being painted with a view to effect, but rather with the object of setting off to the best advantage, in regard to the colour of dress and accessories, a sitter of peculiar complexion; and we cannot tell how far the exceedingly judicious choice of colour in the costume may be due to the young lady herself rather than to the painter in the first instance. The portrait of "Mrs. F. Ochappey" (71), a beautiful woman in a dress of subdued green tones, seated in a landscape, is distinctly a picture rather than a portrait, and a very charming picture; but if regarded as a portrait, as a painting made with the main object of preserving and recalling the personality of the subject of it for the benefit of her friends (which is the main object of portraiture, after all), it strikes us as too artificial in effect. This objection applies still more strongly to the quarter-length portrait of "The Countess of Airlie" (87), a very fine piece of colour, but as stiff, unreal, and expressionless as the ideal head appropriately called "The Wife of Pygmalion" (55), to which this portrait might pass as a companion picture, if divested of the details of modern costume. Such a picture cannot be said to fulfil the objects of portraiture, for it is expressionless to a degree which we do not believe could be with the countenance of any human being of average culture and social instincts; it is a beautiful mask, clothed in the costume of ordinary life. This occasional lapse into such absolute, though, in a sense, beautiful, conventionalism in portraiture, presents a very curious contrast with the life and force of some others of the portraits. Among the portraits of ladies, "Lady Garvagh" (166) in this respect is a marked contrast to the last-named; but the contrast is still more strikingly shown in such portraits as those of Lord Sherbrooke and John Stuart Mill. The latter is the only portrait of Mill which exists, but it is verily a portrait in the highest sense of the word; not only the features but the very mind of that extraordinary character, in which the most critical and logical perception was united with a burning enthusiasm, seems portrayed to us. These two, and some others of the portraits of eminent men (that of Mr. Martineau especially may be mentioned) are models of simple, unaffected, and powerful portraiture, unassisted by any effect in the way of accessories. One of the pictorial portraits which is very effective and at the same time natural is that of a lady playing the piano (63), painted about twenty years ago, and belonging to the artist's earlier style of colouring. The portrait called "The Ulster Coat" (31), representing a pretty girl in that dress, looks quite oddly realistic among the works by which it is surrounded; it is a portrait that in regard to style and feeling might have been painted by Mr. Millais, though that artist, we may be sure, would have made much more of the sister, which in this work is very deficient in texture. One of the sweetest bits of painting in the gallery is the head of a young girl, entitled here "By the Sea" (14), which we rather think is a different title from that under which it appeared in the gallery two or three years ago. For exquisite purity of expression this may challenge comparison with Mr. Millais's "Sweetest Eyes were ever seen"; the execution is as different as possible, of course, but the two works suggest a kind of companionship as the representation, by two great painters, of girlish beauty and innocence.

Interpersed among the ideal and allegorical subjects and the portraits, we come every now and then on a sweet and poetic little bit of landscape painting, marked in every case by that rather melancholy tone and feeling which runs through Mr. Watts's art more or less. The one

called "Near Freshwater" (83) is certainly not a representation of actual day-light nature; there is a conventional tone about it; but one or two of the small evening scenes (No. 27, for instance) are full of beauty and feeling.

Taken altogether, this exhibition is the record of an artistic career pursued with the highest aims, and exhibiting fairly chiefly where those aims have been too high or too far out of the path of the real possibilities of the art of painting; or where, as in some cases we should imagine was the fact, the painter was not greatly interested in his task. Mr. Watts does not seem to have that kind of painter's passion which makes it a delight to paint any object for the mere sake of mastering the difficulties of representation. Precision and finish in prosaic details he does not make a special object. On the other hand, he has attempted in several cases subjects which are nearly out of the reach of painting, and in which comparative failure was hardly to be avoided; though even in these cases the failure is sometimes more interesting than the successes of many other artists. In his portraits this evident strain after something beyond mere realism has led him at times to overlook to some extent the primary object of portrait-painting, the realisation of individual character and personality; and thus the collected portraits present curious contrasts, some of them looking as if the real individuality of the sitters had been merged in the production of faces and figures in harmony with the personages of the painter's own ideal world. These inequalities cannot but be felt; perhaps in one sense they constitute part of the interest of the exhibition. The exhibition is a fine summary of the work of an artist who has aimed higher in his art, perhaps, than any contemporary English painter; and though it is impossible not to feel that the collection, as a whole, betrays considerable vacillation and uncertainty of artistic purpose, it contains two works, at least, "Love and Death" and "Daphne," which are likely to hold their place as long as canvas and pigments can last.

A piece of sculpture by Mr. Watts, a bust entitled "Clytie," which stands on the centre table in the West Gallery, is a bold and powerful work, though a little strained in attitude. The small rooms contain an interesting little collection of water-colours by various artists, among which is a beautiful landscape by Mr. J. W. North, and several good drawings by amateur hands.

#### THE LOAN EXHIBITION AT BURLINGTON HOUSE.

OUR first impression was that the exhibition this year was of rather inferior interest; but, though it is not, of course, equal to some of those which were got up when the field for selection was new, it is surprising how its interest grows as it is studied. We may mention, first, a few of the works which are of special interest, and then touch on the portraits; leaving some notice of other works to a succeeding number.

There is hardly anything more interesting or finer in its way than Mr. Graham's large sketch (for it is hardly more than a sketch in oils) by Wilkie, called "School" (255). As far as a sketch can be so, this is a masterpiece, and shows the very finest qualities of Wilkie's genius. The composition of the whole crowd of figures is admirably managed, and every figure has its own phase of character and expression, from the master who is looking sternly through his spectacles at some malefactor in a distant corner, to the stupid little urchin just under him who is being deprived of his toy, and the boy in the background stretching his mouth with his fingers to make "a face" at his companions. The work, as far as it goes, is finer and richer in colour than Wilkie often was. No work in the galleries attracts more attention than Mr. John Walter's extraordinary Jan Steen, "The Marriage at Cana" (55), represented by a crowd of figures from Jan Steen's own experiences of society, eating and drinking, and being drunken at long tables in front of some architectural scenery. The principal figure alone is singled out from the rest by a distinction of feature and garb following more the received painter's ideal of Christ, and making the incongruity of the others with the supposed scene the more marked. Apart from this, the picture is an excellent specimen of the artist's powers, both in the spirit and life-like behaviour of all the figures,

the complete manner in which all their gestures and actions are related to the whole action, and the splendid painting of the details.

Rubens's "Young Lion" (77) rolling himself round on the ground is certainly one of the specialities of the exhibition, and both in drawing and texture one of the finest bits of work by Rubens we have ever seen. In the same gallery a small and very typical specimen of Rembrandt holds a central place in what is always the "Dutch corner" in these exhibitions; a work called, rightly or wrongly, a "Holy Family" (101), but ostensibly an interior lighted only by one light concealed behind one of the figures, throwing long shadows on the wall, and only half illuminating the gloom: the effect is very fine. Passing to Gallery III., we find the place of honour there given to Reynolds's "Death of Dido" (131), flanked by his figures of "Charity" and "Fortitude" (129, 132). There is considerable power in the first-named work, especially in the head of the dying queen, but the drawing of the torso is unsatisfactory and rather inexplicable. "Fortitude," lent by the Earl of Northampton, in spite of a somewhat affected posing of the hands, is a fine and impressive work, with a certain grandeur about it. Not far from these is an indubitable Leonardo, lent by Mrs. Morrison (139), a female figure shown nearly to the waist, with warm, almost golden flesh tones, and the peculiar half-crooked smile which we know so well in Leonardo's female faces; she is crowned with a wreath of flowers and holds flowers in her hand, which add greatly to the colour effect of the whole. The same owner lends one of the finest specimens extant of "learned Poussin," "The Triumph of Pan" (141), an outdoor Pagan orgy of similar class to the well-known work in the National Gallery, and perhaps in some points superior to that. The real interest of these unassuming works of Poussin consists not only in the power of drawing and the vigorous movement they display, but also in the very intensity of their Paganism. The artist knew that if such scenes (for which, probably, by some accidental turn of his studies he had developed a special capability) were to be painted at all, it was of no use, from an artistic point of view, to do them mildly and decorously. This may be illustrated by comparison with Hilton's very tame group of "Cupid and his Crew surrounding the Lady" (250). Hilton's Pagan dance and behave generally much more decently than Poussin's, and for that very reason fail to produce any special impression on us.

Murillo's remarkable though repulsive work, an "Old Woman and Boy" (153), is one of the most striking things in the collection; repulsive it is from the hideous ugliness and squalor of the old crone, redeemed by figures of a boy and a dog in the painter's finest and most emphatic manner. It is curious to compare Murillo's force and power in this kind of work, which evidently represents the real best of his genius, with the correct feebleness of his "Flight into Egypt" (166). It seems certain that, in painting his religious pictures, the artist was complying with a demand for subjects in a style foreign to his own untrammelled feelings and sympathies, and he offers a curious and unusual example of a painter being known chiefly by a class of works which was evidently not what his own genius would have led him to paint. We may mention among the landscapes two of special value,—Constable's noble work, "The Look" (181), as remarkable for the power of the foreground as for the luminous aerial perspective of the distance; and Richard Wilson's "Landscape" (249), contributed by Mr. James Price, which is an exceptionally fine specimen of Wilson's genius, and has much more power and breadth of effect than his beautiful but rather tamely-painted landscapes generally exhibit.

If the Reynolds and Gainsborough portraits of this year are not as a whole equal in interest to those of some preceding years, there has, at least, seldom been a finer specimen of Reynolds seen in the galleries than "Lady Smyth and her Children" (176), a picture in which the artist was evidently much interested, for he did his very best with it, in composition and colour alike. The three little children are grouped to the right around the seated figure of their

\* There is an absurd mistake in the catalogue, in calling the central figure "Una," the editors of the catalogue having apparently mixed up "Cupidus" and the "Ææris Queens." The lady is "Cupidus" simply "The Lady"; she has no name.



mother; one coquettish little black-haired girl looks mischievously in the face of the spectator; a bright-haired blonde child, half turned from the spectator, forms a beautiful contrast. The contrast of tones in the costumes, and the rich, full painting of the whole, are in Reynolds's finest manner. Near this are two full-lengths by the same painter, "Lady Beauchamp" (180), a gentle but dignified aristocratic figure, clothed in a rich costume,—a white dress over an ample amber skirt (called in the Academy catalogue "yellow"), and "Mrs. Mathew" (183), the wife of the Rev. Henry Mathew, a tall, fair young woman, in a very low-cut dress. The two illustrate very well Reynolds's adaptation of the pose and costume of his portraits to the style of the sitters. In seeing his portraits year after year, however, one cannot but be struck with a certain degree of likeness in many of them, not merely in attitude and accessories, but even in cast of countenance; and this is suggested to us again by Hogarth which are in this exhibition. In Hogarth's "Earl of Maclesfield" (241) we see just the type of face which is so often seen in Hogarth's ideal pictures (though, of course, not depicted with the same kind of satirical exaggeration), the short face with wide mouth and rather snub nose; and this type of face is seen again in Hogarth's remarkable portrait group of the children of "The Graham Family" (275). The contrast between the figures of the society of the day as represented to us by Reynolds and Hogarth is so marked as to suggest strongly the idea that in the mere matter of likeness the portraits of that day were not too much to be trusted; that each painter imparted some of his own idiosyncrasy to his portraits; that Reynolds's ladies in many cases, at least, must be taken as representing a type, with the omission or softening down of some individual peculiarities; and that Hogarth, unconsciously or not, assimilated his portraits to the style of face which he was in the habit of painting. This same group of "The Graham Family" is a very fine specimen of Hogarth, the faces are full of life and character, especially that of the boy turning the handle of the musical box and looking up with a broad grin on his countenance; the oat on the back of the chair is as good in its way, the whole of the accessories are painted with great care.

Gainsborough's portraits of his wife and daughter are interesting, but not quite in his best way; his "Lady Mendip" (19) is a very characteristic likeness of a thin-lipped haughty old lady, who stands very much on her dignity, both in dress and manner. Gainsborough's "Mr. Moysey" (173) is a fine specimen of his manly unaffected style in male portraits; the figure pauses in passing through the picture (it is an out-door portrait), as if looking round at some one approaching. This is perhaps the only Gainsborough portrait of this year which represents the painter at his best, though it is not one of his very brilliant and striking works. Among the Romneys are two fine ones, "The Duchess of Gordon and her Son" (44), and "Mrs." (afterwards Lady) "Morris and Child" (169); the latter is rather white and dead in tone, but the little child is charming, and rivals many even of Reynolds's children. There is a rather slightly painted portrait of Lady Hamilton as a rustic nymph, reclining on the ground with a shepherdess's pipe, also (of course) by Romney, but not one of his best presentations of the too-celebrated beauty.

There is a superb Vanduyck, the portraits of "Lord John and Lord Bernard Stuart, Sons of Keme, third Duke of Richmond and Lennox" (126), two youths attired in the height of the splendid costume of their day, and looking the most completely; two figures in which all the grace, pride, and insolent nonchalance of the aristocratic spirit of the period seem to be summed up. Such attitudes and expressions would seem absurd affectation in any modern portrait; in a Vanduyck picture they are the real expression of what the well-born gentleman of that time believed himself to be in the eyes of the world generally. The cool colours of the one dress and the warm rich tones of the other increase the effect of the group by their contrast. It is curious to notice how superior in artistic effect and interest is this portrait group of two men, who were very likely a couple of young sea-captains, to the much more ambitious subject by the same painter next to it, "Time clipping the Wings of Love" (125); and this makes a practical commentary on Sir F. Leigh-

ton's remarks about the supposed superiority of paintings with a serious moral or meaning to them, which we printed and commented on recently.

One of the most interesting portraits is that of the "Fornarina," ascribed in the catalogue to Sebastian del Piombo; a quarter length showing a very interesting though not beautiful face, very finely finished and modelled. It is labelled "Raphael" on the frame, a title probably merely given to it from the subject, and to which it has no pretence, any more than has the Duke of Grafton's "Carondelet and his Secretary" (160), which is entered as a Raffello. Mr. Boughlon Knight's Giorgione, "A Lady of the Malferi Family and her Son" (151), is probably genuine, and is certainly a fine painting; that it is not of the highest interest may have been the fault of the principal sitter, one of those large, handsome, but rather slow-looking Venetian women who in their mere personal appearance look as if they were created for Titian and Giorgione to paint: the costume is very fine, and the whole effect exceedingly rich. Tintoretto's "Portrait of a Gentleman" (140), lent by the National Gallery of Ireland, is a fine, thing. Among others that may be named, is Reynolds's "Mrs. Stanhope" (15), remarkable for its fine tone and the beautiful painting and expression of the eyes; and Rembrandt's powerful portrait of his daughter (63), one of Mrs. Morrison's numerous and valuable contributions. Stothard's large group of "Charles I. and his Children" (242) one is, of course, drawn to look at by the name, but it is one of those works by Stothard which make one wonder at his reputation. Other works of interest we will mention hereafter.

#### EXTENSIVE NEW RAILWAY WORKS AT FLEETWOOD.

WORKS of a very extensive and costly character are at present in progress at Fleetwood. They will entail an expenditure of nearly 300,000l. The works, which are being carried out at the cost of the Lancashire and Yorkshire Railway Company, who are the lessees of the railway between Preston and Fleetwood, and owners of the docks at the last-named port, include new passenger and goods stations, a granary and steam corn-elevator, and the extension of the pier.

The new passenger-station, 670 ft. in length, will run immediately in front of the site from which the Belfast steamers are despatched. The structure, which is being built of brick, with stone dressings, has been designed by Mr. C. Greece, one of the Lancashire and Yorkshire Railway Company's engineers. The outer walls will be surmounted with gables, having iron principals with ornate spandrels. There will be fourteen gables along the length of the building, each of which will have an ornamental finial. The station will be covered in with a roof partly of glass and partly slated. Large and handsome refreshment-rooms and a dining-saloon form prominent features of the station buildings. There will be two spacious entrances to the station, one leading by the refreshment-rooms straight to a covered way to the steamers, but both go on to the same platform. The ground-floor of the end block will contain two large refreshment-rooms, first and second, together with the dining-hall. The block containing the different offices and waiting-rooms will run down the centre of the station proper, its entire length being 350 ft. On each side of the block there will be spacious platforms, one of which is 290 ft. and the other 260 ft. in length. Passengers proceeding by steamer on arriving by railway at Fleetwood, will be under cover all the way from the train to the steamer, which will be reached along a covered subway, 500 ft. in length. A short distance from this subway there will be a large warehouse, 400 ft. long and 50 ft. wide, with another subway underneath, for cattle. This is in connexion with a new goods station, also in course of erection. The goods will be moved to and from the warehouse by hydraulic machinery. The contract for the new stations and warehouses has been let to Mr. E. Gabbatt, builder, of Liverpool, the amount of the contract being 120,000l. Mr. J. Hodgson, of Manchester, is the clerk of the works.

The extension of the pier is also a work of considerable importance. The extension will be about 130 ft. in length by 40 ft. in width. This work is also in progress, pile-driving having been commenced last week.

The construction of the new granary and corn-elevator, to facilitate the discharge of cargoes at Fleetwood, is likewise in progress. The designs for this structure have been prepared jointly by Mr. Davies, C.E., of Manchester, and Mr. Matlock, C.E., resident engineer at Fleetwood. The warehouse will be 200 ft. long by 50 ft. wide, and will be of great height, with a tower carried up to a height of 170 ft., to which all the grain will be elevated. The design of the building is altogether of a novel character, so far as this country is concerned. The two engineers specially visited New York for the purpose of inspecting similar buildings there for the shipment of grain, and the structure now in course of erection at Fleetwood is the result of their visit to the States. The elevator will be worked by steam, the engines being of 250-horse power, which, with the whole of the machinery, is being supplied by Messrs. Hick & Co., of Bolton. Messrs. Cooper & Talis, of Preston, are the contractors for the building, which has already been carried to a height of 50 ft. The cost of this portion of the works will be about 50,000l.; but it is stated that a much larger expenditure will have to be incurred in collateral works.

#### THE GILBERT SCOTT MEMORIAL.

On Friday, the 30th of December, 1881, a meeting of the representatives of the Sir Gilbert Scott Memorial Fund was held at 9, Conduit-street, in the Institute Library, to make over to the Council of the Royal Architectural Museum the balance of the money subscribed, in obedience with the terms of the resolution passed at the public meeting held in the Chapter-house of Westminster Abbey on Saturday, June 1st, 1878. It was then resolved that the memorial should take the personal form of a sepulchral brass over Sir Gilbert Scott's grave in Westminster Abbey, and after that the founding of an art-teachership in connexion with the Architectural Museum, of which Sir Gilbert Scott was the originator.

The Right Hon. A. J. B. Beresford-Hope, M.P., chairman of the Memorial Committee, explained to the meeting, that out of the promised subscriptions, amounting to about 900l., only 771l. 1s. 10d. had been paid to the bankers. The Memorial Brass, which had been executed from the designs of the late Mr. Geo. Edmund Street, R.A., had cost about 425l., including incidental expenses. The working expenses for printing, postage, advertising meetings, &c., amounted to 57l. 14s. 4d. The treasurer, Mr. Joseph Clarke, F.S.A., had retained 3l. 7s. 6d. to meet a few petty outstanding charges, and the balance which the treasurer had to hand over to the Council of the Museum was 285l. This sum, owing partly to the non-payment of many promised subscriptions to the fund, and partly on account of the cost of the brass, was too small to enable the committee to realise fully the original intention of the promoters of the memorial, which included the endowment of a professorship or studentship, and so it had been resolved to pay to the Royal Architectural Museum the above sum as a grant, on the understanding that the interest of the same at 5 per cent., viz., 14l. 5s., be paid yearly out of the income of that institution to the art teacher of the museum, under the title of the "Sir Gilbert Scott Memorial Stipend." This grant was accepted at a meeting of the Council of the Museum, held immediately at the close of the above meeting, its receipt being signed by the President, Mr. A. J. B. Beresford-Hope, M.P., by the treasurer, Mr. Walter Carew Cocks, and by the secretaries, Messrs. John P. Seddon and Maurice B. Adams.

Kendal.—Mr. Eli Cox, architect, Kendal, has, as we have already announced, been awarded the first premium in the competition for the new market and other public buildings intended to be erected in Kendal. The site chosen is in the centre of the town. The design shows two rows of shops, with the market between them. The interior of the market will be divided into four sections, viz., for fish, poultry, vegetables, and butchers' stalls. The style of architecture adopted is Renaissance. There will be a tower facing each public street, in the centre of the buildings, surmounted by ornamental cast-iron gilded crests, with the coat-of-arms of the borough introduced into the masonry below the tower roofs. The architect's estimate for the buildings, including site, is 16,000l.



## PISTOJA AND ITS MONUMENTS.

To gratify the interest excited by the illustrations of Early Pulpita in Pistoja given in our last volume, p. 730, we proceed to add some particulars of that interesting town and its monuments. Whatever may be the cause, it certainly happens that within a very short distance of some of the most noted sites in the world, places all but neglected are to be found the interest of which, great as it is acknowledged to be, is lost in the prestige attached to the more widely-known centre near which they may be situated. Pistoja, in close proximity to Florence, belongs essentially to this class. In spite of the increased number of travellers who now pour into the Tuscan capital, it may fairly be said that Pistoja is scarcely more visited, perhaps even less, than in the old days when on the long "diligence" or *vetture* journey into Italy it formed one of the striking features of the entry into Tuscany. But now that the gigantic engineering enterprise of the railway which connects Bologna with Florence has been completed, and that the traveller is whirled in a few hours through mountain gorges and over deep valleys, through almost countless tunnels down into the lovely valley of the Arno, Pistoja is but one of the stations on the line, and it is scarcely to be expected from the average traveller that at but an hour's distance from Florence he will pull up, even when "Pistoja" is bawled into the carriage, though out of the window he may see rising temptingly above the old walls the graceful arched tower of the old cathedral. In Italy, now that one travels by railway, it requires some amount either of blase ignorance, of stolid indifference, or a determined repression of feelings, as historic names meet the eye and ear at the innumerable stations on any line one may be passing over, and so it happens in the present day that many a delightful spot, once seen and never forgotten, in the pleasant, even if lengthy, carriage journey from town to town, is now passed by, and visited only by the earnest student or the fortunate resident in the neighbourhood. It is true, perhaps, many of these towns are interesting only to the professional traveller, and as such it is not to be regretted that they are left unaffected by the influence which what one may term "the profane ruck" of sight-seers so fatally brings with their presence.

Under this head, Pistoja may be classed. Pistoja, with its many early Italian architectural features, is, perhaps, after all, only genuinely interesting to the artist and the archaeologist; to the mass it is but one more of the many old towns which, to the numbers who travel abroad, now exert little attractive power. But to the lover of architecture and archaeology, to the student and admirer of early Italian art, and for him who travels for true sentiment, it would be difficult to recommend a more delightful spot than Pistoja.

An hour's ride by rail separates Pistoja from Florence, the line passing along the beautiful valley of the Arno, with all its little villages and romantic villas, as redolent of historic memories as are of perfume the thick groves of myrtle and orange from above which, guarded by the tall solemn cypress, the white walls peep; past Prato with its traditions, religious and artistic, another of those pleasant, too little known spots, though now a steam-tramway connects Prato with Florence, which modestly repose under the walls of an all-absorbing capital. At Pistoja, when once the line of the walls has been passed, through the city gate, where little remains of antiquity but the vexatious officer of the *doge* or town dues, one enters a thoroughly old Italian town, almost unspoiled by the whirl of that modern spirit which has swept over Italy from north to south, and left it apparently for some time to come in a madly chaotic state. Thirty, even twenty, years ago, Italy was the Italy of centuries gone by with the few changes which the passage from one generation to another had rendered obligatory; it was into this existence that the English contractors, with their railroads, and the railroads with their inevitable consequences, suddenly broke. How need we wonder that Italy and the Italians seem different from what they used to be to the traveller who passes but a few weeks among them? It is a curious problem what the result will be, but in the meantime we artists and archaeologists, who still cling, with all our love of modern improvements, to the beauty of the past, hail with the reverence due to those we regard as our teachers any still untouched storehouse of suggestive study. Such a storehouse Pistoja may justly be termed,

with this peculiar feature, that, like its hallowed neighbour, Pisa, its character is singularly homogeneous. The town is stamped by the epoch to which its monuments belong, an epoch of artistic and historic interest to which not long ago the late Professor of Architecture at the Academy devoted one of his most instructive lectures, which has rendered this corner of Tuscany an enlarged Campo Santo to the art-lover. Pisa, Lucca, Pistoja, and Prato encircle Florence on the north like so many gems surrounding the central brilliant in a rare jewel.

Pistoja is now only a quiet humdrum town, like many others that the traveller meets with in Italy, though when we last passed through it, a leading street that had remained untouched perhaps for centuries was being re-paved. Time was, however, when Pistoja played an active political part, when the historic quarrel of the Guelphs and the Ghibellines, and the family feuds that sprang out of it, divided the country so cruelly. Pistoja in those days,—the end of the thirteenth century,—was, as it had long been, a wealthy centre of trade, with a population which loved and cultivated letters and the arts. With the traces it possesses of its prosperity in those days, and of the earlier times which preceded the thirteenth century, and the remains of the art which followed and led up to the Renaissance, Pistoja is a town of more than unusual interest. On its quaint *piazza* is a characteristic assemblage of buildings; the cathedral with its black and white marble courses, the graceful bell-tower, the elegant baptistery, the Podesta's grim palace, and the Gothic palace of the bishops. Here, in the *piazza*, centred, as was usual in every Italian city, the whole political life, and strikingly impressive is the appearance of the group. Taken singly, the interest is scarcely less. The cathedral, as a cathedral, dates from the fifteenth century, but its present aspect, the black and white courses of marble, the characteristic type with which one so soon becomes familiar in Tuscany, was given it in the thirteenth century by that most industrious and greatest of the early Italian architects, Niccolò Pisano, and many are the beautiful details that the student will find on the facade, on the porch, and particularly the bell-tower or campanile. We are out of ear-shot, even if on fine days we can see in the mist of the valley Giotto's graceful tower at Florence; why should we hesitate to whisper that perhaps a greater degree of beauty, the beauty of archaic simplicity, may be found in this humble scarcely-known campanile of Pistoja than in the world-sung bell-tower, to protect which Charles V., so tradition says, wished he could make a case as for a precious jewel? Interiorly the cathedral of Pistoja has passed through the hands of the Vandals, and little has escaped their ravages. Near the door, however, half-hidden in the dark, on the wall is the tomb of one of Pistoja's great scholars, one of that band of learned Italians who shed among us Northern barbarians in the dusk of the Middle Ages some of that feeble glimmer of culture which was to herald the coming of the Renaissance. It is the tomb of Cino Sinibaldi, a jurist, a poet, and a friend of the divine Dante, long a professor in the University of Paris. But not all legal are the memories connected with his name, for with it is woven a touching love-tale which he sang in sonnets not yet forgotten. His beautiful Selvaggia ranks, indeed, with students of Italian song, with Dante's Beatrice, with Petrarch's Laura, or Boccaccio's Fiammetta. Cino's tomb is one of that characteristic type of the thirteenth century in which in England Aymer de Valence's tomb in Westminster Abbey is a much finer specimen. On a bas-relief below the canopy is represented the master in his chair lecturing to an audience.

As for the Baptistery, it too might vie favourably with its more renowned neighbour at Florence, but no Ghiberti has modelled for it its gates; its simplicity and beauty are too modest to satisfy the general, and the octagonal baptistery of Pistoja, with its delicate architectural details, and its characteristic effect as a whole, will stand yet many a year before the name of its cunning designer, Andrea Pisano, and its builder, the Sienese architect, Celino di Nese, are commonly known. Though of the same period, belonging to a strangely different order of ideas, the Gothic Podesta's palace is not the least interesting of the many features of Pistoja; its rugged exterior is like that of most of the town-halls of Tuscany, and of which the great Palazzo della Signoria and the Bargello at Florence form the most familiar type; a few

scattered painted windows in the grim front of the building, a huge central gateway opening to a graceful court-yard from which an external staircase leads to the upper stories. As at the Bargello at Florence, the court-yard of the communal palace at Pistoja is strikingly impressive, its walls are covered thickly with paintings and the emblazoned arms of the great rulers, the great lawyers, and the great captains of the town in the stirring days of Pistoja's prosperity, and wonderfully does the picturesque Italian heraldry lend itself to the purposes of decoration. The court-yard has been restored now nearly forty years ago, and, rare fact to note, with a skill and care that call for our tardy praise. At the foot of the staircase is an inscription stating the date of the work (1844), an inscription which, for having been noted down perhaps for the first time in an English pocket-book, is none the less suggestive of the true value of decorative art. The municipality having resolved on the restoration of the pictorial decoration of the walls of the court-yard, determined that the heraldic paintings should be continued, "not alone for the sake of beauty, but that posterity shall here read the story of our annals." It would be difficult, we imagine, to enunciate in simpler words the true principles of decorative art, and strikingly successful has been the result obtained by the authorities of Pistoja, the sombre arcades lighted up by the symbolic colouring of the heraldic coats of arms. To no man can the architect justly give greater affectionate praise than to the herald of the past, and even until the present day and through all time, he has preserved correct types of his art with more preciseness than other artists, although it is sad to see so much well-understood heraldry so ill-surrounded as we often are in the habit of meeting. The heralds have always been artists as well as antiquaries.

To the student of the beautiful Italian architecture of the thirteenth century,—of the thirteenth-century architecture, that is, which, as Mr. Street had but only lately explained, is less more to local influences or inspiration, Oriental rather than Northern,—Pistoja offers in several of its churches a number of brilliant and rare features, often untouched examples. In the cathedral we have already made reference. In the Church of San Giovanni Fuorivitas we have another perfect example of this delicate style, its front closely barred with the familiar black and white courses which give so marked a character to the semi-Oriental edifices of this interesting period, and which so clearly shows the work of the artist who built up Pisa. Here, as there, just as the late Professor had recently said of the Pisan cathedral, the "walls are all arched externally, the arches in the true Byzantine style very thin and flat, and for ornament only. Under every arch there is a lozenge-shaped panel of coloured stone or marble. The piers on either side of the arches are all inlaid with patterns of extremely elaborate character, and the sculpture of the foliage has everywhere the excellence of execution, the conventional symbols, and the variety of design so invariably seen in Byzantine work."\* It is in this little church, with its shrine-like exterior, that reposes one of the several pulpits,—the very word is Italian, *pulpito*,—which may be regarded as among the most interesting relics left to us of the thirteenth century, and in which Pistoja is so rich, sharing a privilege with Pisa, with Arezzo, with Lucca, Prato, and Siena. As to the artist of this pulpit, at such a distance of time doubts might indeed be permitted when no inscription or data exists. It is alone, in fact, by the peculiar character of the sculpture that any judgment can be formed of its origin. It is square, and supported against the wall by two brackets, on the outside by two columns resting on the backs of two symbolic lions, such as are so constantly to be met with in Medieval Italian architecture.† As for the bas-reliefs, their merit, in spite of the view taken of their German origin, justified by their undoubted quaintness, possesses so strongly a Classic character that one may with safety support the more recent theory of their being the work, if not of Niccolò Pisano himself, at least of one of his best pupils.‡ Almost contemporary with

\* See *Builder*, vol. xl., p. 298.

† The lion is the emblem of the Resurrection, and as such is the symbol of St. Mark, the historian of the Resurrection.

‡ Such, at least, is the opinion of M. Henri Bello, the French Consul at Florence, who may be said to know Tuscany better than any other foreigner now resident in Italy, and of whose studies we largely availed ourselves on our visit to Pistoja.



the pulpit in the antique church of San Bartolomeo,—and to which we lately called attention,—which shows on the part of its sculptor (who has signed his work with the date 1250) a broad acquaintance with the art displayed on the sarcophagi of antiquity, the bas-reliefs in the pulpits of San Giovanni show distinctly the marked change that art,—the art of the sculptor, at least,—underwent in this extraordinary thirteenth century. In the sculpture, as displayed in these Tuscan pulpits, we can trace easily this development; those who know Tuscany are familiar with the pulpit at the little town of Gropello, not far from Pistoja, a quaint, almost rude, production (of which we gave a view in our last volume, p. 730), but which unquestionably inspired the later works of the Pisani, the work of one of those many German or Lombard artists who worked in the twelfth century in this part of Italy. In the pulpit of San Giovanni we have reached the century of Niccolò Pisano and his school, which was to influence so largely the peninsula. From every quarter Niccolò's advice is requested, and his designs and works we find scattered over Italy in many a church and steeple. Here, at Pistoja, it was he who designed the cathedral, to be carried out by his scarcely less talented son Giovanni.

In another of the quaint churches of the busy thirteenth century, Sant'Andrea, will be found another pulpit. In this case no doubt exists regarding its author: he has proudly written in characteristic Gothic letters his name and birth-place, "Giovanni, son of Niccolò, born at Pisa." This pulpit is, in fact, the work of the delicate artist who designed the chapel of the Spina,—so painfully and so unsatisfactorily restored,—and that "noble museum" of the Campo Santo. To those familiar with Niccolò Pisano's pulpit in the Baptistery at Pisa, either by the superb cast made of it some years since, and now at the South Kensington Museum, or by the scarcely satisfactory photographs, the pulpit of Sant'Andrea (already illustrated in our pages) would appear an old friend; for, like the pulpit at Pisa, it is hexagonal, and supported by seven columns, one being central. The bas-reliefs resemble also those by Giovanni's father at Pisa, but already in the few years that separate the two we see the move in the development of the art, which has now been so well explained and described by modern antiquaries. Pistoja is fortunate in the possession of four such rare relics as the four pulpits of its churches, in the sculptural decoration of which can be traced distinctly the development of Early Italian sculpture from the feeble efforts,—even if so full of character,—of an art whose sole life was dependent on the force of tradition, to the work of the founder of the school which was to render so glorious in the history of art the Florence of the Renaissance.

In this movement, in which were so intimately bound up the sister arts of architecture and sculpture, Pistoja takes, it will be seen, an important place. If to the sculptor its churches offer a field for suggestive study, to the architect there is scarcely less subject for profitable inquiry at a moment when it is not difficult to perceive a growing taste for what has long been understood as the art of the Renaissance, a period which, the more we study, the more we shall find how easily the lovely work of the Gothic thirteenth century may be made in perfect harmony with the best Renaissance. The position of Pistoja, placed at the entrance from Lombardy into the Tuscan valley by one of the important defiles of the Apennines, early led the Lombards to take their mark on the old town; and to this building activity of those semi-barbarians, Pistoja, in company with so many other Italian towns, owes the erection of many of its religious edifices, in the busy eighth century of good King Luitprand, whose pious zeal in erecting basilicas and cloisters throughout his dominions even the industrious builders the *magistri Comacini* could scarcely satisfy. These churches in Pistoja may be classed, therefore, among the oldest in Italy, but of their original construction little remains; a scarcely less marked period was to stamp them with its character, which for seven centuries they have been fortunately allowed for our delight and instruction to preserve. As for the Lombard foundations, their interest is perhaps purely historical. The Lombards possessed no architecture of their own; their architects were Italians, students,—debased students, though their work was full of character,—of the Roman ruins among which they lived. Here, in Pistoja, the inspiration of the architects has been

clearly Eastern, and the delicate polychromatic decoration, the lozenges of marble mosaic, speak openly of Byzantium, of that second period of Oriental influence (the first had been at Ravenna) which, when with the revival of existence, for such it may be called, in the eleventh century to which the Royal Academy lecturer referred not long since, Italy awoke to freedom and prosperity, its relations with the East opened again, freely the road to the artists of Byzantium. So, it was that the Tuscan towns in their prosperity appealed to erect for them the churches in which they were desirous to show their splendour.

St. Paul's is another of the several interesting churches in Pistoja belonging to that marked Italian Græco-Gothic style so peculiar to this portion of Tuscany. Of the original eighth century Lombard foundations little remains. It is to the middle of the twelfth century that the church in reality belongs, the façade of white marble with bands of black, in this case far apart, the arched open gallery, the delicate pointed portal, whose elegant effect and charming details would justify the tradition of its design by the author of the Spina Chapel at Pisa. On each side of the door two pointed niches, once the tombs of great Pistoian families, whose arms are still embossed on sculptured shields beneath the rosettes, are effective; the whole lower wall of the church on the front and side is thus ornamented, affording one more feature of that suggestive decoration which is so marked a characteristic of the period. Pistoja in such features is rich, as it is in specimens of several of the phases through which architecture in Italy passed between the sombre tenth century and the Renaissance.

Of the Renaissance, Pistoja bears deeply the trace. Not Florence itself can show a building of greater interest than the hospital of the Ceppo, whose beautiful polychromatic frieze, the work of Andrea della Robbia, is justly ranked high among the artistic curiosities of Italy. Pistoja possesses a number of hospitals, relics of the pious zeal of the plague-stricken Middle Ages. It was to commemorate an act of charity on the part of one of their bishops that the inhabitants resolved, early in the sixteenth century, to confide the frieze, the execution of which was confided to the family of Della Robbia. It is not in the space of a few lines that the interest connected with Luca della Robbia can be done justice to. Familiar as is their work to the cultivated few, full appreciation has not yet been bestowed on the creations of the Della Robbia family. Luca Batista Alberti, the great and cultivated architect of the Renaissance, was, perhaps, the first to understand the peculiar merit of Luca della Robbia, and did not hesitate to place him as an idealist by the side of such artists as Brunelleschi and Masaccio, and between Ghiberti and Michelangelo. Of Luca's work, his charming so-called "invention" of terra-cotta *invasi*, or glazed, the vogue it enjoyed, and its architectural value for decorative purposes, we need scarcely speak.

During the latter years of his life,—he died, modelling-tool in hand, at the age of eighty-three,—Luca had been assisted by his nephew, Andrea, an artist whose creations are scarcely less impressed with ideal grace and beauty than those of his uncle. Andrea was, indeed, one of that earnest band of artists who had allowed themselves to be fascinated by the fervent teachings of the unfortunate Savonarola, but he continued with his three sons the field of artistic industry which had been opened by his uncle. At Pistoja, where he has left among other works his ideally natural "Visitation" at San Giovanni, Andrea commenced the great frieze of the hospital, interrupted by his death in 1528, at the good age of eighty-four. The frieze his sons continued, as they did the secrets bequeathed to them by their father, but with the death of the last Della Robbia in France, about 1553, the great art of Luca may be said to have perished. His processes were imitated, and to this day much of the so-called Luca della Robbia were shown the stranger in Italy is but the production of these clumsy copyists.

The frieze of the hospital,—of which the Crystal Palace has possessed an excellent cast ever since the opening, now nearly thirty years ago, of Wyatt and Waring's beautiful Renaissance Court,—has been attributed to Luca, but though he may possibly have given the design, artistically there is every evidence of its being rather the work of his nephew Andrea, com-

\* More recently the Paris École des Beaux Arts has erected a coloured cast of this frieze.

menced by him and completed by his eldest son Giovanni, and his younger brothers. Into further discussion regarding the authorship of the work we imagine it is needless to enter. The long polychromatic enamelled frieze, which runs above the round-arched arcades of the hospital front, consists of seven compartments, each representing one of the works of charity: clothing the naked, feeding the starving, relieving the thirsty, receiving the pilgrims, visiting the prisons, visiting the sick, and burying the dead. The figures which compose the various groups are admirable in their observation of nature and artistic composition, while the elegant ideal female figures of the cardinal virtues which separate the compartments possess a grace of the most fascinating nature. In these days of the photograph, it is needless to describe minutely any works to which has been done such ample justice by the lens as has the frieze of the Pistoja hospital: the photograph has admirably rendered the beauty of this creation of the Della Robbias, one of the most characteristic of the many works with which one meets in Italy, in which, in ideal union, the architect, the sculptor, and the painter have successfully and lovingly worked together; as a piece of suggestive decoration, it would be difficult, we imagine, to point to a more satisfactory production of the three sister arts. Those who visit Pistoja now will be grieved to find the old hospital stoutly shored up; time has worked its effect on the masonry, and since the Government has wisely declared the building a national monument, it has been determined to protect the work as far as possible until funds, so we were told, are collected for the purpose of strengthening the work. Fortunately the frieze and the large medallions remain unharmed, and will long exist to surprise by their freshness and brilliant beauty visitors to the little Tuscan town which contains so many features of the rarest artistic interest.

#### THE METROPOLITAN BOARD AND THE HABITABILITY OF LONDON.

THE relation that exists between the proceedings of the Metropolitan Board of Works and the growth and good order of the metropolis is so close as to make it matter of extreme interest to all those who are connected either with architecture or with the building trade, to regard the annual estimates of that Board with more than a passing glance. Very often, as especially with regard to the notable project for the double water supply of London, it is clearly necessary to read between the lines of documents that are invested with much official regularity of form. The steady rise demanded in the rates, not only in the amount which is naturally due to the growth of the metropolis, but in more than triple that ratio, is a fact not to be overlooked. The rateable value of the property of the metropolis is now 27,887,000*l.* This is more than double the corresponding value when the Board commenced its rule, but the payment was then at the rate of 2*d.* in the pound. In 1867, it had grown to 7*d.*, and with the exception of that year the estimate for 1882 is the highest yet demanded, being 6*2**d.*, or almost exactly 6*1**d.* in the pound.

The amount to be raised by the Metropolitan Consolidated Rate in 1882 is 715,822*l.*, which other items of revenue make up to the large total of 1,311,604*l.* But it should be borne in mind that 41 per cent. of the rate, or 2*1**d.* in the pound, is raised for the purpose of extinguishing debt, a portion in 1929, and a portion in 1941. This is, we will not say a robbing of Peter to pay Paul, but a financial operation some what of that nature. Our own opinion rather inclines to the propriety of including a sinking fund in the arrangement of every loan; but it must be remembered that the doctrine of sinking funds is one that has been fiercely attacked, and that the question is one that has two sides. All, then, on which we insist as to this, is that the rate-payers should be made clearly to understand this item of enlargements of the rate.

At the same time that the Board's liability is thus decreased by something under 800,000*l.* per annum, it is, however, being increased at the rate of 2,000,000*l.* per annum. And it must be borne in mind that any provision which increases the facility with which a public body can get into debt has a direct tendency to increase the readiness with which they incur, vicariously, heavier burdens. The Metropolitan Board are already responsible for loans to the amount of



20,850,000.; and the set-off which is placed against this in the shape of the estimated value of surplus lands, that is to say, vacant sites, has, as we have before now pointed out, a somewhat problematical value. The sum of 2,760,000. is given as that of the value of the surplus lands, and out of these 21 millions of borrowed money the Board have lent 3,630,000. The deficiencies under the heads of the Dwelling-house Improvement Fund, and on the expenditure in virtue of the Artisans' Dwellings Act, as well as for other local improvements, are of a serious amount; and altogether the question of how far the action of the Board tends to interfere with private industry is one which is by no means clearly made out. The figure of 32,000. for "Bridge Expenses" is also one that demands attention.

When we compare the areas awaiting the builder in London with the sums at which they are valued, the result is hardly reassuring. The unoccupied land in Queen Victoria-street is valued at 907,000.; that close by Charing-cross at 648,000.; that on the Victoria Embankment at 125,000.; at Theobald's-road at 200,000.; at Great Eastern-street, at 152,000.; in Tooley-street, at 100,000. These are large sums, and the slowness with which they are reduced is enough to raise various doubts. The mode of letting by tender adopted by the Board has never commended itself to us. In the case of Northumberland Avenue, we can say of our own knowledge that it operated injuriously.

The covert part of the case which regards the expenditure of money by a Board of any kind is that the interest of the expending party is generally so much more warmly supported than that of the party who pays. It has been so with our railways—it is so with our sanitary authorities—it is so with the Metropolitan Board. Who represents the ratepayer? It is replied, the directors, or the Board, are the trustees of the shareholders, or of the ratepayers. But there is somewhat of an anomaly in the positions of these bodies. Trustees are usually appointed with the express purpose of preventing the lavish outlay of money. Now it would be easy to point to instances, not 100 miles from London, in which money has been laid out with a lavish hand which can hardly be regarded as that of a cautious and conscientious trustee. A good speculation, indeed, such outlay may prove. But, on the other hand, it may not. Now when any question of outlay comes before a Board, the professional advisers will almost invariably be on the side of increase. It may be, and we hope, generally is, the case that such officers are disinterested in their recommendations. They may simply see the desirability of doing work thoroughly, of doing it all at once, and of doing it in a creditable manner. At times, of course, human nature being what it is, the suspicion of job will arise. But apart from any bad reasons, there are always good reasons why the advisers of a Board are pretty sure to be advocates of more, rather than of less, expenditure. The mere position of director or member of a Board may seem to inspire a sort of lordly despatch of the petty and the cheese-paring. Who, then, defends the ratepayer?

Under our old local arrangements the vestries settled their own rates. That this should be so far overruled as to give positive validity to the debts legally contracted by public bodies is, of course, indispensable. But it is quite another thing to entrust to a Board, however respectable, the sole power of the imposition of rates for future works. The question is by no means a simple one. On the one hand, we are told by the sanitary reformers that the local authorities perversely refuse to take the proper measures for the public protection, because, as the members are themselves the largest ratepayers, they stick to the policy of not spending a penny that they can help. On the other hand, we have the enormous and ever-swelling crowsbill of expenditure by local authorities. In 1870-71 this expenditure was 30,000,000. In 1877-78 it had risen to 49,300,000., rising at the rate of not far from 3,000,000. sterling a year. Of this large sum 23,000,000. are said to be expended for "remunerative purposes," a division purely arbitrary and misleading. The fact remains that the payment of the Englishman under the name of rates bids fair to catch his payment in the form of taxes, the proportion already being about five to eight. Who could have imagined, fifty years ago, that our old impatience of taxation, on which impatience was based the power of the House of Commons, should have so far

disappeared as to allow of so large a proportion of the public burden being imposed with so very little in the way of direct authorisation, either by Parliament or by the ratepayers?

#### SOME NORMAL AND INFORMAL ASPECTS OF SKILLED LABOUR.

The characteristics of life and labour of the workmen of several of the skilled trades at the present hour is of a most varied kind, and bears but little resemblance to the system that obtained even as late as half a century ago. This change is more observable in our large cities and towns, and particularly in London, than in other places. We have, so to speak, now in our midst, both a normal and informal system of artisan and manufacturing labour, with strongly-marked and strongly-defined characteristics, which are widening every year, and it is apparently, if not obviously, the outcome of the keen struggle for life consequent on the rapid growth of population in our large cities, and the difficulty of the part of workmen, as a whole, no matter what their talents may be, of obtaining constant employment through the old channels of labour. Now, if we take the building and furniture-making trades as examples, and as most cognate to the field of our advocacy, we shall find in close examination that these trades are in sundry ways practised by classes of workmen belonging to them. The regular workmen, as of old, are the workshop hands, working in numbers for the building employers and furniture-making firms, but the irregular or informal class of workmen comprise a miscellaneous group of hands, part employers and part operatives, jobbing workmen, small manufacturers preparing work on speculation, or for sale, in their own small workshops; or, again, they are of a class of artisans who are operative and itinerant, or, in a word, workmen and hawkers.

In former years the skilled artisan who, through old age or accident, or other causes, was unable to hold his place with his fellow-workmen, or draw the same wages, fell back from the ranks and took to some light form of jobbing on his own account, or commenced to manufacture a number of household articles in common use, which he sold at low prices. The indifferent workman, also, often retired from the regular ranks of workshop labour, and did the same kind of trade as the former. All over London now, and in other cities, though to a far less extent, artisans of a compound class will be found in the character of working masters and working men, some labouring singly or with the help of members of their family, or otherwise with an odd hand or two; but never attempting anything large, or involving an outlay for new plant or appliances, or forcing them to move out of their peculiar groove. Almost every trade is now represented by what may be called jobbing-hands, part employers and part workmen. Of course, still, as of old, sundry building, furniture, and other firms undertake jobbing work; but a great inroad has been of late years made in this field of labour by the informal and composite class of jobbing small masters and workmen we have indicated. In the suburban districts of London the jobbing class of workmen are now almost legion, and in many instances they are patronised by the middle classes and small shopkeepers. In the jobbing building and repairing lines, within certain limits, they are ready to attempt every class of work, whether they are capable or not.

The proverbial "three-branch hands" are completely put in the shade by the operations of these jobbing "jacks-of-all-trades," who find a certain sphere for their action, and as cheapness is a consideration with those who employ them, the character of the work they perform is not closely scrutinised. As two-thirds of our latter-day suburban houses are neither architects' nor responsible builders' houses, it perhaps matters but little that the character of their repairs is in keeping with that which signalled their erection. Substantial repairs to many of such houses would, in the hands of a respectable employer of labour, mean rebuilding, and we know it is often a life struggle with the owners or occupants of the houses we speak of to keep them in anything approaching a healthy or habitable condition. Apart from the many-sided jobbing building or repairing hands, there is another class of artisans who confine their practice to a species of light joinery, and sometimes combine with it a little white cabinet or

furniture work. These working masters may often be found in our bye City streets, but more generally dispersed in the suburban quarters. Ordinary street shops constitute their work and show-shops. They manufacture in a small way, and among their stock may be found step-ladders, window-blind and rubber rollers, racks, clothes-horses, kitchen drawers, tables, dressers, brackets, boxes, cases, drawing-boards, ironing, kneading, and other boards, together with a great variety of nick-nacks and articles constantly required in households. This class of artisans, if called upon, are always ready to do a little job of joinery work by way of repair in gentlemen's or tradesmen's houses, confining their labour to woodwork alone, and a little plain painting of the work that passes through their hands. A more humble class of wood-workers still are those whose circumstances oblige them to hawk about for sale a certain class of goods they make for domestic use.

In certain branches of the furniture-making trade in London, the East End particularly, for some years past a system of hawking about work has been cropping up, and the causes that have given rise to it, and tend to perpetuate it, are rather disagreeable and disquieting features in our social system. Outside the cabinet and chair and sofa making journeymen, who work either by daywork or by piecework (the latter is now general), in regular furniture-making firms, there is a very large and widely different class or classes of furniture-making workmen. These constitute the small chamber masters and workmen, or both combined. The condition of the workmen of this class at the present time is in many instances deplorable. Large numbers of these small chamber masters and workmen are continually engaged in not working to order, but on "spec," and their work, when finished,—sideboards, tables, chests of drawers, or chairs and sofa suites, as the case may be,—are carted forthwith to the well-known furniture markets, the streets of furniture warehouses, where buyers are sought, and often without success. Purchasers, indeed, among the warehousemen of some of these furniture centres may be always had, and for nearly every class of cabinet work, but not at prices that would enable the small chamber manufacturers or workmen to live. A picture may be seen in any week in the year on the eastern borders of the City which exhibits some of the characteristics of a slave market, and very unpleasant aspects it presents of the present condition and social belongings of the cabinet trade. The workmen, or that section we speak of, are, indeed, martyrs to circumstances, and it is certainly not their will, but their necessities, which consent to their acting in the capacity of hawkers as well as skilled and hard-working handicraftsmen. Cabinet-makers of former years were workmen, and workmen only, employed in executing work by the day or piece for distinct masters as employers, but a great change has come over this once fine and prosperous trade, as well as some others in our midst. These changes, unfortunately, have seldom been an unmixed benefit to the public, or an advantage to the cause of skilled labour.

While commendable efforts are now being made to improve British workmanship by technically, or, rather, practically, educating the young artisan, it must not be forgotten that there are other questions to be solved which call at the present moment for serious consideration. The apprenticeship system in this country is dropping to pieces, and one skilled trade after another is being minutely split up or divided into sections. In the place of the old general skilled artisan of our regular workshops and large firms we have the part-workman, and in several instances trades are presenting the proverbial ten-men picture of the pin-making trade. Indeed, trades the practice of which was confined to the making of one or two articles,—for instance, boot and shoe making,—are now divided into upwards of a dozen, machinery at the same time being pressed into service. In joinery and other building labour, the splitting-up process is proceeding, and in our large firms the general skilled workman of the old school is becoming a *rara avis*. The difficulty with the technical educationists will be how best to apply scientific instruction for the benefit of individual workmen, under present conditions, with apprenticeship falling into disuse and skilled trades minutely divided into parts. It is plain that while the general workman would be immensely benefited by technical knowledge or scientific principles applied to his art, the part or fractional workman will reap but little advantage,



and, if he does, the peculiarities of his position will allow him no scope for the application of his bit of knowledge to his bit of trade. Despite, however, of some not very pleasant aspects of our skilled trades, no hesitation should be manifested in affording every facility to the young workmen of the British Islands in acquiring scientific knowledge and applying it. The normal labour of our present highly-organised workshops and a sub-divided system will be reacted upon to a certain extent by outside and informal skilled labour, and the friction will have its good effects. General workmen, in the character of working masters and men, will exist outside our large firms in one form or another, and the service of men who are skilled in every part of their trade instead of one part thereof will be sure to find a field for their labour, and a class of persons who will avail themselves of their abilities. Between many-sided skilled hands and what are known as "handy men," of course, we draw no comparison, for the latter class may not be artisans at all, though ready to job at anything and generally botch everything.

To sum up for the present, it may be said that the whole skilled trades of these islands are in a rapid state of transition, and little more than mere commercial principles for long years have been receiving attention. Production has been increased and cheapened, but fierce competition at home and abroad has tempted not a few, we fear, to manufacture inferior articles. A number of capitalists may have enriched themselves, but their successors are injured, and a worse result has been the demoralisation of the workmen. Work remains to be undone as well as done, both by employers and workmen, before the manufacturing industries of the country in their conduct and management present a healthy state. Commercial morality, or, in other words, honest work and honest materials, must be the order of the day, or scientific knowledge applied to our skilled trades and industries will be labour and education in vain.

#### ANTIQUE ART AND OUR ART.

It has been said at times that as a nation we are somewhat insensible to art and to art influences; but those who so say, or think, can hardly have sufficiently reflected on the fact of the number and influence of those societies which take cognizance, in so many and different ways, of art, and of the things pertaining to it. Indeed, so many and so energetic are they, that it would be difficult to find an art-subject, however small or great, which is not in some way or other fostered and brought to the world's notice by some one or more of them. That this may be affirmed of the art of architecture is most certainly true. Some of these societies are art-producing in no small degree; others put before the public, in some way peculiar to each one of them, the works of the artist; while all, to a great extent, do not a little in helping the public to judge, more or less accurately and justly, of the character and merits of the works produced and exhibited. We need but hint at the vast sums annually expended on art, taken generally, and how, in not a few cases, no sum, however large, would seem to be too much to pay for what has thus, by skill and genius, been produced and placed before the wondering eyes of the eager purchasers and lovers of art. Of the sums spent in house-decoration and architecture, nought need here be said. All goes to prove the power and inherent strength of that art-faculty which all, whether learned or unlearned, more or less possess and seek to gratify.

We are led to these thoughts on art-production and the action of art societies from consideration of the modes in which "art" is nowadays added to year by year and hour by hour, so different from the ways of it in antique and Gothic days. In those so distant and "unenlightened" times, no architect certainly thought for a single moment of precedent, or would for a moment have thought of looking at it, either to copy it or otherwise utilise it; and right fortunate is it nowadays that they of the past did not do this. So different, indeed, was the past plan and *modus* of art-production to that of our modern and of to-day mode of work, that it would seem strange that more attention has not been given to it, and further search made by those who have every year, through travel and vacation leisure, the means of doing this. Nowadays all know how a new church or a new cathedral, or even a new town, is brought into existence, and whence the "details" of them, and of each one

of them, come, and how all this is worked out and made to do such new and modern duty. In the antique days there could have been none of this.

To this we would ask the attention of those who have made architecture their vocation, from the fact that every now and then we hear accounts of newly-discovered ruins of buildings, and even of whole cities, but of which the very style of art, or even a hint of it, cannot, from the but too-meagre descriptions, be in any way come at. If the geologist, travelling in far-off and utterly unknown regions, sometimes lights on objects which help to link together things which would appear to be almost hopelessly apart, so does the discovery at times of a lost fragment of art or architectural detail serve to make complete and intelligible what would otherwise be unintelligible and fragmentary. No one can go into any art or architectural collection, even of details and fragments, and study them with any due attention, without in a very short time perceiving this, and without, indeed, wondering how much is to be learnt, and made clear, and even mentally completed, through the looking at, and the careful study of, what would seem to not a few to be all but worthless and void of interest.

We venture to think, therefore, that no more effectual way of furthering the true understanding, if that be the word, of art could well be indicated than that of the making note of any remains of it now to be met with *in situ*, and where it may be seen in a primitive state, unburied and indigenous, and where expressive, as in such state it must needs be, of the minds and character of those who produced it, and where, too, perchance, evidence may be found of a natural progress inherent in it while it prevailed. There is nothing in art-history more curious than the entire isolation of the several art-centres, e.g., the Egyptian, the Greek, the Gothic, of whatever date, wherever they may have prevailed, or however long they or any one of them may have lasted. No one of them would seem to have borrowed anything, and our museums, however imperfect they may be, and feebly illustrative of the several isolated styles of art and architecture, do but show this in the most striking way, if examined with sufficient attention, and for a time long enough to enable the art-student to get at the idea of any certain style, and thus to perceive how isolated it is, and how like a primitive and national language, originating and growing up and maturing itself, as does a language in so mysterious a way,—a curious art and architectural problem hardly as yet touched on.

To make our meaning the clearer to those new to this view of art-progress, we may cite the well-known history, or changes, of Gothic art as here seen, on purely English ground. English Gothic art and architecture had their birth in the so-named "Romanesque," and by insensible though sure degrees, and step by step, passed into the "Decorated," to use the so well-known though awkward term, and thence into the "Perpendicular," or "Third Pointed," and then in reality died out, and became, until its "revival" in our own day, utterly extinct. It may be said roughly to have taken something more than three centuries to do this, and to work out this isolated architectural history. It is said in the text-books that the Renaissance and the coming-in of it, just at the right time, did all this, and killed the Gothic; but a very slight examination and analysis of that idea and of the problem will show that the Gothic, after birth and growth, and full maturity and age, died out of itself, leaving the ground bare for the introduction of the Italian, as it came to us from Italy, where it, as a new style, grew out of the remains of the old Roman. Here, again, it will be seen that "precedent," as now understood, did not help in the work, and that all the changes in general forms and in details followed each other. Forms were added as words to a language are added to it, and the forms changed as words are found to change, and thus in time a new style, or a new phase of the older and preceding one, takes the place of it, and that in a way altogether out of present experience.

We would, then, urge upon those who have fortunately lighted on some lost link of art or architecture not to lose the opportunity of making careful note of it, however insignificant it may at first sight seem to be, for the whole course of any certain style of art in the past of things, and according to the old ways of work and art-action, was that of a growth, however

slow and gradual, even to decay and final extinction, as seen in the Gothic, as above cited. This was the old-world idea of art and architecture, and the method of those who worked them out and utilised them, is beyond doubt, and may clearly be seen by all those who will take the trouble to see for themselves. That our present and day-by-day art-action is thus new and special to the time and age in which we now live is certain. We are here indicating facts, and calling attention to a problem in art and fine-art action which has hardly been touched on, but one which, if thoroughly examined and analysed, might lead to much that must be novel and full of curious detail. None can, we take it, suppose for a moment that the outer world, or ourselves, are at the end of the art-producing faculty inherent in human nature, or have exhausted the forms and combinations of forms,—of beauty and grandeur,—of which nature gives all about us the hint and the keynote. And in addition to this, we would urge the importance of completing, as far as may be, the illustrations, whatever they may be, of any typical building of which we are, as it is, fortunately possessed,—as at the British Museum, of the Parthenon. We have, sadly perhaps, as it is, spoiled that world-famous and unique structure. We have got all the life out of it, that is certain, and a part at least of its supporting architectural framework. These have been got by chance as much as by aught else, and certainly not with any idea,—such as that we are now urging,—of making complete illustration of so notable a building, either as to its architecture or its sculpture. We have before this urged the acquisition of a complete section of the entablature of this unique building, enough of it, say, to take in a meope, thus to afford some adequate idea of the admirable and perfect way in which the sculpture was made to fit into and to harmonise with the architecture,—always, be it ever borne in mind, not the result of the sculptor's mere handicraft working out the design of another through the medium of drawings and descriptions and directions, but out of himself as artist and stone-carver. It would be hard, indeed, to find, as we think, a more instructive and art-inspiring addition to the "architectural section" of the British Museum, now that preparations are being made to add to it, than this addition to its architectural teaching.

#### THE PARTHENON.

A PAPER was recently read by Herr W. Dörpfeld before the Architectural Society of Berlin on the internal arrangement of the Parthenon. The general result which the lecturer arrived at was that the views of Herr Karl Bötticher which have for a long time been accepted in Germany on this subject are erroneous, and that the conclusions, advocated by an English observer (Mr. Penrose) at an earlier date, correspond very closely with the reality. Herr Dörpfeld was enabled to settle this question, because he had been for several years in Greece, acting as head of the German excavations at Olympia, a position in which he had had the opportunity of learning much that had hitherto remained obscure about the interior construction of Greek temples. The ancient method of building with stone differed from the modern in the fact that in the former the blocks or cubes go through the entire thickness of the wall, and are laid close together without mortar; while in the modern practice the blocks of stone are rather only a sort of facing, the interstices being filled with mortar. Amongst the ancient Greeks, the technical execution of the work was performed with incredible care and exactitude. This is proved by a very interesting inscription found in Sicily. It consisted of 8,000 words. They were inscribed upon a block of marble, and represented the original contract between the authorities of the Temple of Zeus at Livadia and a master-mason respecting the replacement or change of thirteen flags on the floor. The contract prescribes how the alterations are to be made in the minutest detail, describing the materials to be employed, how the work is to be executed and the tools to be used, the contractor being threatened, in case of non-observance of these terms, with the severest penalties.

In order to protect the blocks of stone from injury they had to be delivered with what was called the "working edge" (or inch). The cubes were often lifted and moved about by help of hooks or holders, which were inserted in holes



that were made on the surface, or on two opposite sides of the stones. A second method was to lift them by ropes put through a hole that passed right through the stones. Another expedient was to cut two horse-shoe-shaped channels on opposite sides of the stone, in which the ropes could be fixed; or on one side a hole was made that grew larger towards the bottom, and in which a "wolf" could be fixed; or, finally, two bosses or projections were left on opposite sides of the stone, so that the hooks or ropes could be easily attached. These various expedients to assist in moving the cubes of stone do not appear to have belonged to different periods of history, but to have been employed simultaneously, the choice of the particular method being determined by the material used, the size of the stones, and other accidents of the moment. The cubes were laid one upon another, sometimes with their entire surfaces touching. At other times only their outermost borders, which had been specially cut for the purpose, were in contact, while within there was a hollow where the stones did not touch. The method of getting the blocks into their intended places in the wall was as follows. They were moved along the underneath layer by help of crowbars, which found the necessary hold in a number of holes made in the upper surface of the lower stones. There was often no fastening between adjacent stones in a horizontal direction, but more frequently they were joined by means of clamps of bronze, iron, stone, or wood, of various shapes, I, Z, double dovetail, or the more simple form still in use. The blocks in structures of marble were connected vertically by small bolts, while in case of other building materials there was no vertical connexion, at least, so far as the edifices found in Olympia and Sicily are concerned.

In the case of columns, the separate drums were similarly laid one upon another, either with their entire upper and lower surfaces touching, or with only a specially cut outer border in contact. The latter was in some cases reduced to a minimum, forming a mere edge. The vertical fastening in the stones of a column was often effected by means of simple bolts, but they were by no means invariably employed. The axis of the column frequently corresponded with a joint in the stylobate, whereby the stability of the latter was considerably increased. Sometimes the lowest drum of a column was placed upon the middle of a block in the stylobate; in this case the blocks lying between each two columns were free from any burden or pressure, and were consequently liable to displacement.

When the Parthenon at Athens is carefully examined by the light of the above-mentioned facts, it is found that the description of the missing parts of that edifice, as presented by Herr Carl Bötticher, contains material errors in four cardinal points.

1. According to Bötticher, in the walls separating the *cella* properly so called, and the space or room called by him the *Opisthodomos*, there were on both sides doors which were, of course, indispensable on the assumption that both rooms were for the same purpose. It is true that doors are found there, but they do not date earlier than Byzantine times. This is obvious from the fact that the holes for the taps had been driven into the marble blocks, a thing which is never found during the Classical period. On the contrary, in such cases, in order to protect the marble, bronze appliances had been invariably employed. It is farther to be remarked that the separate stones of the sill at the foot of the cross-wall are joined horizontally together by I clamps, which would have been visible if doors had been there. The argument of Bötticher against this, that a special stone was laid at the foot of the opening, is quite beside the mark, for it is very improbable that two rooms on the same level would be separated by a high sill; and, moreover, the clamp required to connect such a stone with the wall is not found, any more than the holes wanted to move it into its place. It must, therefore, Herr Dörpfeld thinks, be taken as proved that in the original temple there were no doors in these parts.

2. The back room of the *cella* is represented by Bötticher to have been a niche in which the well-known colossal statue of Athens must, according to him, have stood, the side walls of the niche lying in the direction in which the columns run. This hypothesis is quite arbitrary, for at the places where Bötticher assumes the walls to have been, not only are all clamps and bolts wanting, which are otherwise found in all the sills of the Parthenon walls, but the holes necessary for fixing the blocks are likewise

absent, while in every other ancient Greek wall built of such cubes they are invariably present. We must, on the contrary, assume, as was done by Penrose long ago, that the two side colonnades of the *cella* were connected by a transverse *stoa*. Bötticher argued against this that it would then have been narrower than the *naos*, and that the axial distances of the columns must then have been different. These arguments were shown by the speaker to be inaccurate, being based on false measurements and other erroneous assumptions. The existence of a *stoa* is proved by the fact that, close to the corner supports, which may have been either columns or pillars, there were a number of smaller-sized blocks in the stylobate, which were inserted in order to make the axes of the succeeding columns, in both directions, coincide with the joints of the remaining blocks of the stylobate.

3. The statue of Athens, according to Bötticher, stood on the niche by the separating wall between the two chief apartments. In the Temple of Zeus, at Olympia, which in every essential particular of the hypæthral *cella* is analogous to the Parthenon, the great statue of Zeus stood farther forward in the *cella*. This must also have been the case in the Parthenon, as is shown by the traces found in an analogous position of a rectangle corresponding to the substructure beneath the statue. Moreover, it is more probable to assume that, as the same sculptor supplied the statues both to the Temple of Zeus, in Olympia, and to the Parthenon, and as the interior arrangement of the *cella* in both buildings was almost entirely similar, so the statue would occupy a similar position in both instances.

4. Finally, some remarks are due to the names applied by Bötticher and Bökh to the different portions of the edifice. There is no dispute about the Pronaos or the Hekatompedos (the "hundred-foot" *cella*). But the question is, what was meant by the Parthenon? Bötticher applies the name to the hinder portion of the *cella* where the image of the goddess was placed. It must be remembered that a very careful inventory was kept of the treasures preserved in the Parthenon, and that the register was revised every year on the entrance of new officials upon their duties. Now these inventories constantly classify the treasures according to the three apartments in which they were kept, namely, the Pronaos, the Hekatompedos, and the Parthenon. In the first we are told there were kept the precious cups, dishes, bowls for consecrated water, and so on. In the second were the wreaths, votive offerings, statues, and so on; while in the Parthenon were placed the vessels used in the Panathænic festivals, the trophies, the damaged votive offerings, and other articles. It appears from this statement that the Hekatompedos must have contained the treasures accessible to the public, while in the Parthenon were those from which the public was excluded. In the Hekatompedos inventories, too, the chryselephantine statue of Athens is enumerated, while among the objects preserved in the Parthenon some leaves, probably broken off the wreath of the Nike belonging to the statue of Athens, are expressly mentioned. It is proved by this that the portion of the *cella* in which the statue of Athens stood was not the Parthenon, but the Hekatompedos. Moreover, the other sections of the *cella* can be shown not to have been the Parthenon. It therefore follows that the large apartment called by Bötticher the *Opisthodomos* should really be styled the Parthenon. The well-authenticated fact that the moneys of Athens and other deities were kept in the *Opisthodomos* is not sufficient to prove Bötticher's hypothesis; for by that term is meant the back entrance-hall, which, according to Bötticher himself, was provided with chests between the columns, and was quite large enough for the purpose referred to. Finally, as a matter of fact, only four apartments (and not five, as in Bötticher) are ever spoken of in ancient documents in connexion with the temple, and these are, as given by Penrose, the Pronaos, the Naos Hekatompedos, the Parthenon, and the *Opisthodomos*. For Bötticher's fifth apartment, the *Posticum*, there is no foundation.

The Bijou Theatre of the Bishop's Down Grove Spa, Tunbridge Wells, was opened on the 21st ult. The institution, which has been erected from the designs of Mr. B. Taberner, architect, was recently described in some detail by us. The new theatre adjoins and is entered from the commodious drawing-room of the Spa.

## THE IRON AND COAL TRADES IN 1881.

In the year 1881 the position of the iron and coal trades has very materially diverged from that they occupied at the end of the previous year. That year found the rate of production very low, and it raised it to the highest pitch known in the history of the trades,—so high, indeed, that in the case of iron it far exceeded the demand, and stocks accumulated in the hands of the makers, and in the warrant stores. And during the early months of 1881, the same "over-production" was witnessed; but in the later months there has been an entire change, and a reduction in the production, and an increase in the demand, has brought down the stocks in the largest of the producing districts. Concurrently, there has been a development of the demand for manufactured iron, and the year ends with both the rate of production and the prices in a more healthy state than at the beginning. In the coal trade there has been throughout the year increased and continuous activity. The output of coal has been, it is almost certain, very greatly increased in 1881, even over that of its predecessor, which was that of the maximum production. In part, this was due to the enlarged exports of coal and to the increased consumption of coke for blast-furnace uses, but there is little doubt that (if the experience of the metropolis is a test) the general home consumption has been very materially increased in the year. The tendency, however, has been, in the coal trade, towards higher prices, which cannot be said to have been the case in the iron trade, except in the last few months of the year. Naturally, for coal, the variation in the prices has been much greater in some districts than in others, but where there has been a production devoted in equal proportions to many purposes, the trade has been much the steadiest, whilst in districts devoted to one branch the fluctuations have been the most marked.

In the iron trade it may now be said that, though there was in the early part of the year a very marked and heavy dejection in the quantity of iron and steel of all classes shipped to one or two large customers, yet, for the year, it is tolerably certain that the total volume of the exports will be equal to that of the previous year. In the latter half of the year the total tonnage of the iron exported has been considerably more than that of the corresponding period of its predecessor, and hence it is that the dejection of over 300,000 tons in the volume of the exports in the first half of the year is now practically counterbalanced. There was a cause for this in the fact that, whilst in the early part of the year the prolonged winter was against the export trade, in the latter part of the year the comparative mildness of the weather has allowed exports to be made after the time the trade to certain districts was stopped in the year 1880. But there can be very little doubt that, whilst in the early part of the year 1881 there were many circumstances which told against the trade, in the latter part of the year there has been a marked revival of confidence in the future, and this and the effect of the restriction of the production of pig-iron in the Cleveland and Scottish districts gave a stimulus to the trade as a whole. Hence it is that there is now so general a belief that the iron and steel trades have entered on a period of improved and improving trade, and that the year 1882 is likely to be one of higher prices and of full demand and higher wages. It seems to be generally expected that not only has the era of depression in the iron and steel trades passed away, but that there has also been an entrance into a period when the demand for steel for railway uses, and for manufactured iron for the shipbuilding industries, must be reflected in a general improvement in the whole of the iron and steel industries, and one that must markedly affect also the coal trade. Though it cannot be said that the iron trade is yet free from dangers, yet it must be admitted that there is ground for the belief that for these sanguine anticipations there has been a preparation that will largely conduce to bring them about. Large orders are known to have been placed for steel in various forms,—for steel ingots and rails for the United States and for other countries; whilst Canada and other of our colonies seem to be again entering the field as large buyers of our metallurgical productions, though not to the extent that the United States has been of late. Hence there is now a consumption of pig-iron for the purpose



of the manufacture of steel rails in several districts that is unparalleled in the history of the trade. Although, against this, there is the set-off of the declension that has been increasingly marked in the last few years in the iron-rail trade, yet there is, even for the manufactured iron trade, the activity in the demand for shipbuilding iron to keep it at a high production, and to make it also a large consumer of crude iron. We have, therefore, to notice an activity in the iron trade as a whole, and though in the two districts that have been noticed there is now a restricted production, the returns that have been recently issued show that the consumption is, in the great Cleveland district, above the production, and with the declension in the stocks in the hands of the makers, a more healthy state of the trade seems to have set in.

When the iron trade is busy, that briskness is immediately passed on to the coal trade, and thus there has been in the past year a production of coal that is unparalleled, and that enlarged output is insufficient for the growth in the demands on the coal-owners. It is thus clear that the production will need to grow concurrently with any increase that may show itself on the part of the non-producers. But iron has only, in the case of the crude article, passed the maximum output,—a much larger quantity and proportion having been exported,—while, on the other hand, the quantity of coal that is sent out of the country, either as coal, coke, or patent fuel, is very small in proportion to the total output in contrast with the proportion of iron. Coal, then, feels more the demand from the home market, and it is to be expected that, as it has had its production raised to an extent that must have claimed the starting of many of the collieries that were laid idle two or three years ago, so any addition to the demand in the early future can be supplied only under two conditions.—1. Collieries that were laid idle because of the comparative dearthness of their working will be called into operation; and, 2, there will be an increased demand for the labour needful to produce the coal. It must be expected, then, under these circumstances, that the price of coal will move upwards, regardless of any movement that may be made in the price from other causes. The rate of wages in both the iron and coal trades is now very largely regulated by the price of the product of the labour, under the various sliding-scale regulations, and as the tendency of the prices of coal and iron in the market of late has been towards a higher rate, it may be assumed that this will be shown in the realised or actual prices, and from this be reflected also on the wages of the workmen. It is too soon to do more than glance at the general outlines of the prospect, but these alone indicate a brightness for the two greatest of our mineral and metallurgical industries in the New Year.

#### THE ELECTRIC LIGHT AT THE THEATRE.

Now that the electric light seems successfully to be fighting its way and is invading the theatre,—now, in fact, that that horror of the “gods” and dire consumer of oxygen, the traditional central chandelier which hangs so threateningly above the stalls or pit, seems doomed to disappear,—the new illuminating power is destined to develop fresh questions for discussion. The change promises, in the first place, to be greater even than that from the reeking tallow-candles of the past, or from the next step, the Argand oil-lamp, to the introduction of gas. The conditions under which theatrical effects have so far been obtained, both on the stage and in the house, find themselves, it is clear, entirely altered; a new departure has to be made, it cannot fail to be evident to any observant eye.

That there are artists and artists in all countries is pretty well understood, but it is difficult for the many, at all events, to quite comprehend the enormous difference between the true and the would-be artist. The ordinary artist, such as we all understand by the term, will be exceedingly difficult to satisfy with regard to the method of lighting the theatre by electricity; however little the ordinary artist's opinion carries weight with it, we cannot altogether disregard his view, conventional though it may be, of the methods of lighting representations that undoubtedly have for object the conveying, by an ingenious and more

or less skilful deception, the effect of reality. Now the electric light, as it has been introduced into our theatres, certainly suggests that a perfectly different method of decorative art for the auditorium, as for the theatrical effect on the stage, has to be adopted.

The electric light seems to show up all the poverty of ill-executed, and to try even the best executed, distemper-work, to an extent that must be positively distressing to the worker in that old and justly esteemed mode of decoration; and when one sees the effect of the new light, one cannot but understand the lamentations of the painters of the fourteenth century, who regretted that lime-white as a pigment was not as expensive as ultramarine. But happily in all this there is little ground for serious alarm. The intellectual effort that has led, in so short a time, to the absolute promise of the successful application of electricity for illuminating power, will, we may feel sure, on very easy terms accommodate itself to the artistic demands in the matter of satisfactorily lighting theatrical representations. Indeed, from many points of view, we may welcome a new means of illumination, so far less destructive than gas, which has hitherto dimmed in the course of a few years the most brilliant artistic efforts.

We have had recently brought before our notice painfully the dangers of fire at the theatre, and the opportunity has been seized to dwell once more on the superior safety of electricity, together with a promise of an absence of those terrible nuisances at the theatre,—heat and draught. Others who may not be quite sure on these heads look forward to some advance in the interior decoration of our theatres. It is not from our upholsterers that we can expect this advance to come, for they so far have done their utmost; it is from the painter and the stucco-modeller; and here it is sad to feel how lamentably the traditions of ceiling-painting have died out on this side of the Channel. On the Continent, on the contrary, we constantly hear of distinguished artists being employed to decorate the ceilings of theatres; at Rouen the Opera House is at the present moment being decorated (if the work is not at present actually completed), under the direction of M. Leon Glaize; and M. Clairin, we heard some time since, is hard at work on the ceiling of the Cherbouge Theatre. As for the superb ceiling of the Théâtre Français, at Paris, executed during the few weeks the company were over here in London not long since, M. Mazerolles has made himself a name in French artistic circles for this feat, by which he has represented all the dramatic glories of “the house of Molière.”

In these days, when art is constantly assuming what is incorrectly termed, but generally understood, as a decorative character, here is a field open to our professors and their pupils,—a field at present left lamentably uncultivated. But, as we have remarked, the conditions under which these paintings are to be seen have, it must be remembered, been singularly changed by the introduction of the electric light, and only experiment can form competent artists.

The management of the electric light on the stage so as to please the experienced artistic eye is a very difficult matter, and probably it will not be until a school of artists with this aim in view has been established that we shall be able to see the gorgeous effects that our stage may bring before us. One thing is certain at present, the effect of electric light on stage scenery is very far from satisfactory; in fact, so far is it from being so, all our old admiration and recollections of the splendid scenery of Stanfield, Griefs, and Telsin, and abroad of Allegri and others, is terribly disturbed; and we compare our memory of the past, with our recollection of the present, and the comparison is sadly to the disadvantage of the latter.

That progress is the law of existence, in matters theatrical as in all things human, is a truism; now, when we have reached the maximum of splendour in costume,—not in correctness, that is certain, but in costliness,—when we have attained by the aid of French art, of satins, silks, electro-plate, and electric light, the utmost degree of glare and glitter, what progress remains to be accomplished is a question that every old theatre-goer must constantly ask himself. It is evident that the next step must be taken in the direction of a greater consideration of artistic effect,—of artistic effect, that is, such as it is understood by the painter, and not the theatrical

manager; the acknowledgment of the value of gradation, the value of contrast, the value of shadow, the value of proper grouping, the value of relative tones, of consideration of proper relief in backgrounds, of concentrated light, with many other pictorial secrets, the existence of which, though amply acknowledged and appreciated by the theatrical scene-painter, costamier, and manager, seem by them, for what reason we know not, to be entirely thrown to the winds. We see all glare, all glitter; our eye is fatigued; we see Ossa piled on Pelion; we see the stage crowded with all the most gorgeous tones that the palette can produce or the laws of M. Chevreul prompt; in fact, the stage-manager has allowed what no sensible painter ever permits,—his palette to get the mastery of him. We see, in fact, that most important of all the laws of pictorial effect violated,—the law of contrast. It remains, therefore, for us to hope that the next move may be in the direction of a more thoroughly artistic and pictorial improvement of our theatrical effect; and let us not believe that we alone are sinners: our friends, the French and Germans, are just as bad as ourselves, only that there exist in both countries exceptions,—exceptions from which we may learn much.

It was on the 28th ult. that the electric light was used for the first time in a theatre both for the auditorium and on the stage when Mr. D'Oyly Carte applied it at the Savoy Theatre, Strand, the performance being Messrs. Gilbert and Sullivan's delightful “Patience.” There was no failure, and all went well. The absolute safety from fire assured by this mode of lighting has nevertheless yet to be settled, and we were glad to see all the glass globes containing the light (some of which were very warm) and the conductors protected by wire guards.

#### ADMISSIONS TO THE ARCHITECTURAL SCHOOL OF THE ROYAL ACADEMY.

The following were admitted on the 2nd inst.:

*Students of Upper School.*—J. Coates Carter, A. Keen, T. Wheeler, C. J. Marshall.

*Students of Lower School.*—J. W. Addison, R. T. Blomfield, M.A.; H. Dickenson, H. Field, H. Gruggen, E. J. Jackson, G. E. Laurence, T. Maclaren, G. T. Oakeshott, T. Gambier Parry, F. Sanders, A. D. Smith, King Tatsuno, T. Ward.

*Probationers.*—J. H. Ball, D. W. Bellhouse, W. D. Carö, B.A.; H. O. Cresswell, W. F. Gargery, F. L. Lee, J. O. McHutcheon, E. S. Norton, P. J. Poppelwell, J. G. Sankey, H. A. Stobell, W. C. Bee, H. B. Thorp, F. H. Tallock, A. F. Vigers, G. G. Wallace, G. W. Ward, J. H. Woodd, W. H. Woodroffe, E. Woodthorpe, jun., B.A.

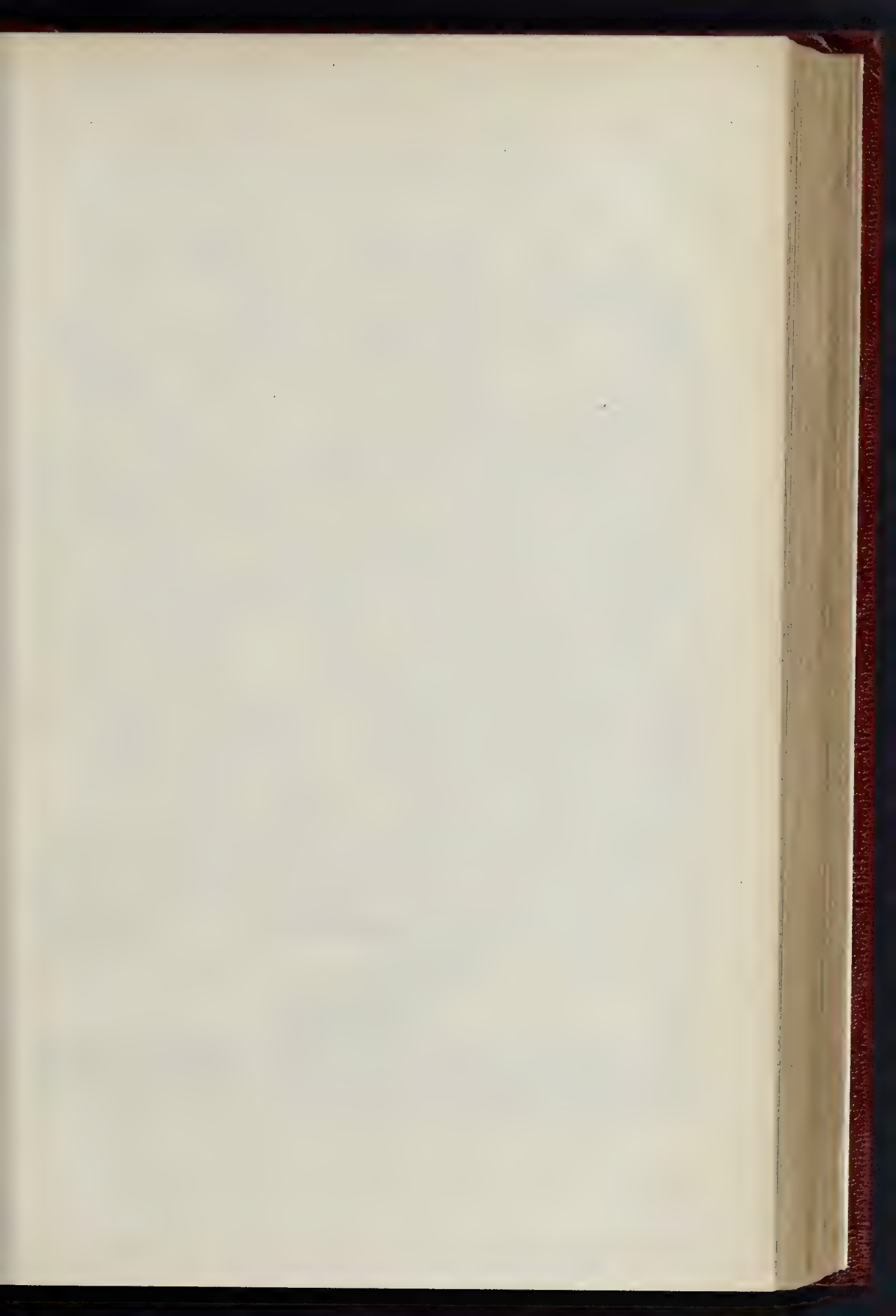
#### COMPETITIONS.

*The Proposed New Fulham Infirmary.*—At the last meeting of the Guardians, a discussion arose on a motion that the plan marked “M.D.” should be submitted for the opinion of the Local Government Board, the reasons urged being that it was more in conformity with the instructions of the Guardians than the plan designated by the motto “Experience in a Circle”; because of the very great difference in the cost between the two plans; and bearing in mind that, as the Guardians paid the 100 guineas, the plan became theirs, and they could then make such alterations in “M.D.” from “Experience in a Circle” as they thought fit, and so get a building to cost 44. to 5d. per foot instead of 6d. to 8d. In the end, by an amendment that was carried, on a division, by nine against five, it was settled that the design “M.D.” with the report sent therewith, should be forwarded to the Local Government Board, requesting them to consider the same, and to inform the Guardians whether it met their requirements. It was also agreed that Messrs. Giles & Gough's second specification should also be sent to the Local Government Board.

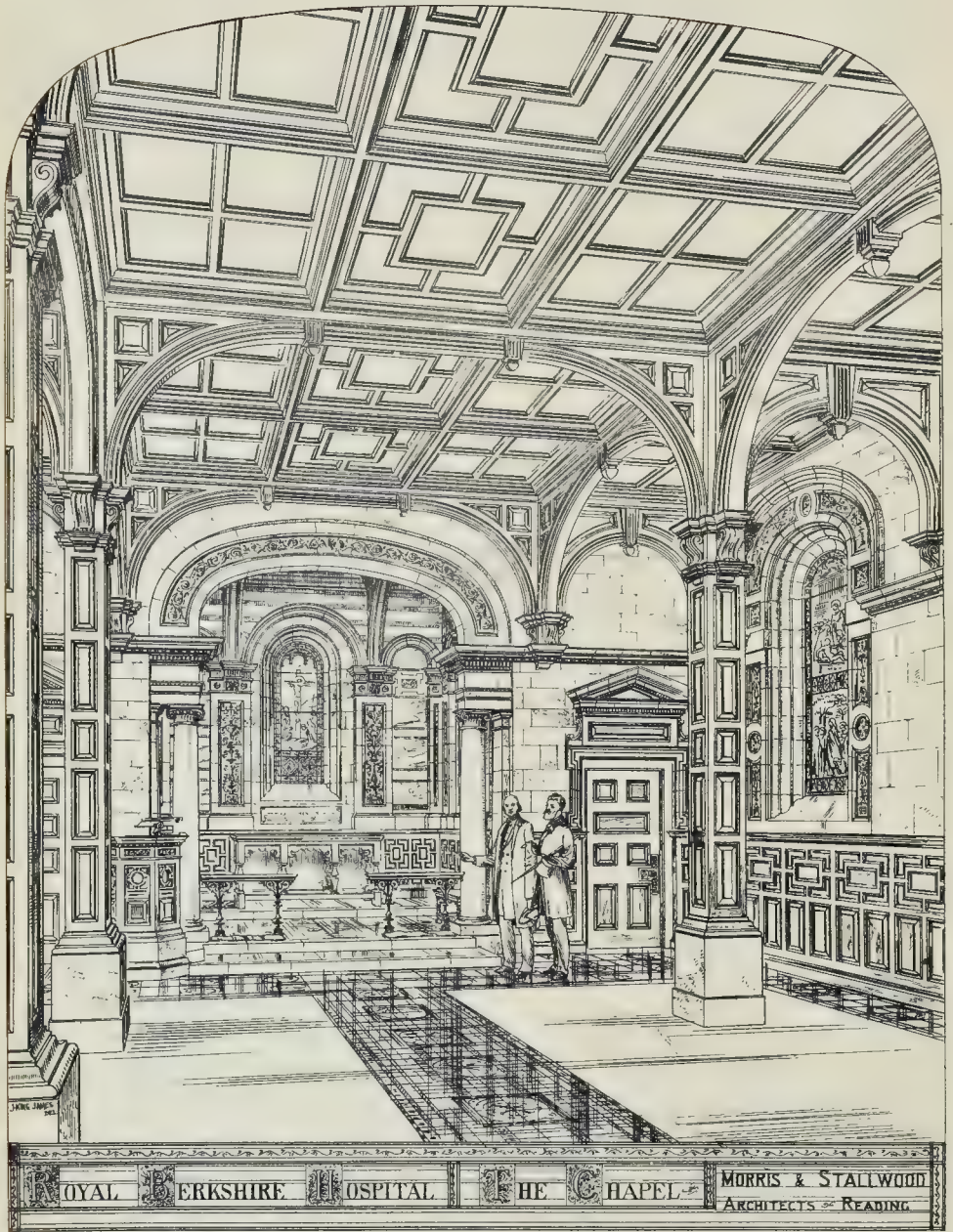
*New High School for Boys, Gateshead.*—The plans of Messrs. Oliver & Leeson, submitted in limited competition, have been selected by the Council.

*Royal Academy.*—A general assembly of Royal Academicians will be held on the 18th inst., to elect two Associates.





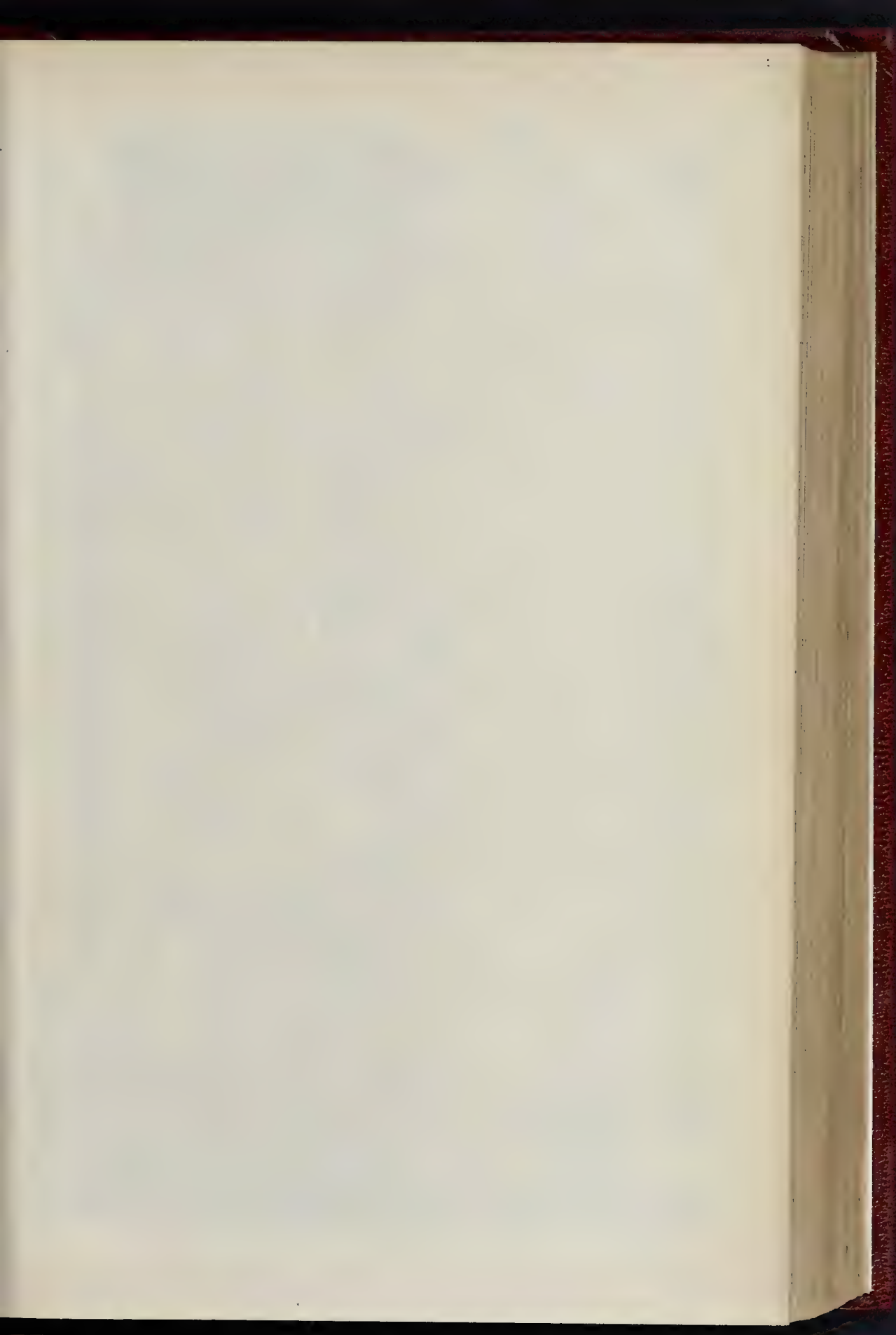




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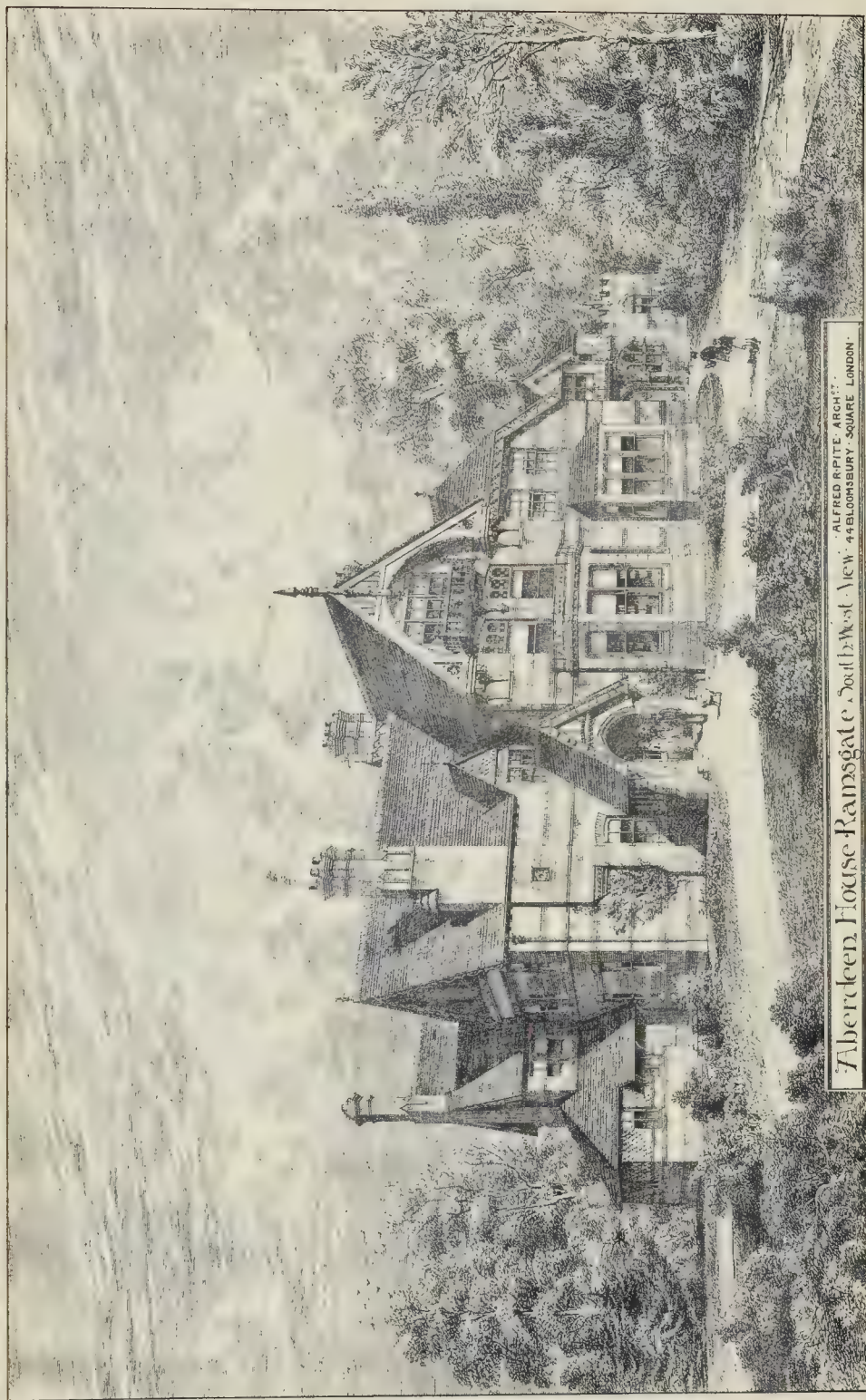
Wyman & Sons Printers O'Queens 51



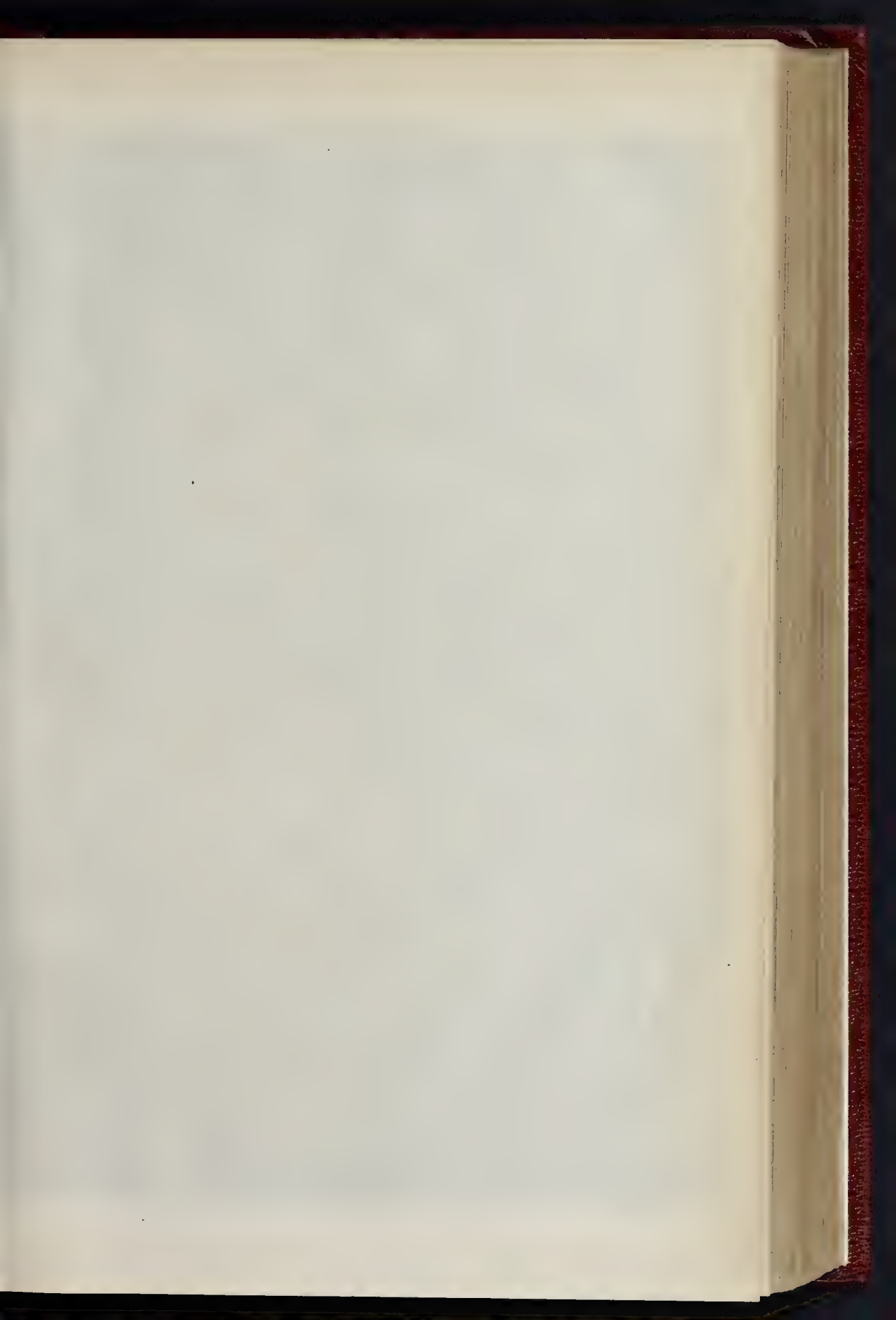




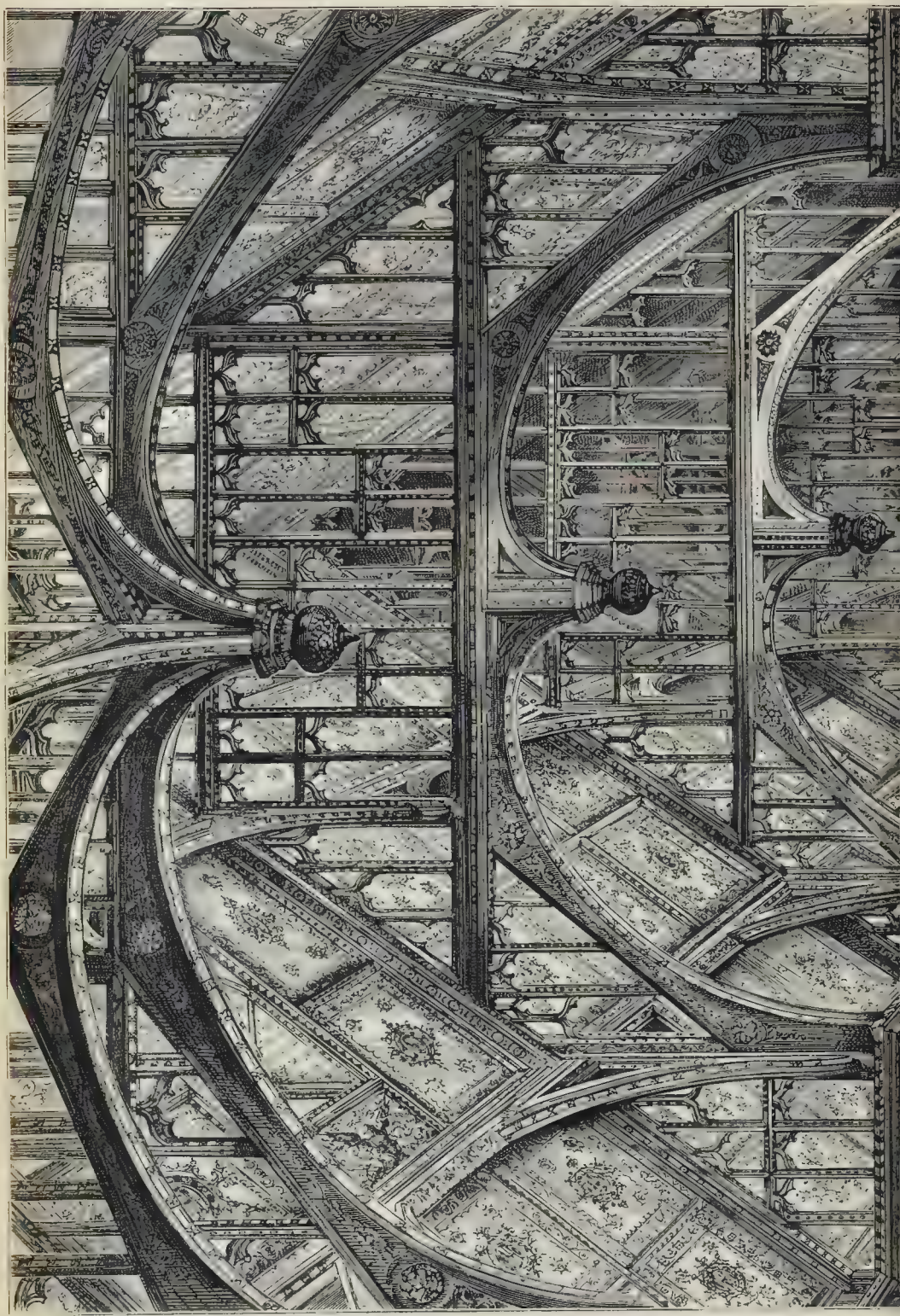
THE BUILDER. JAN. 7, 1882.



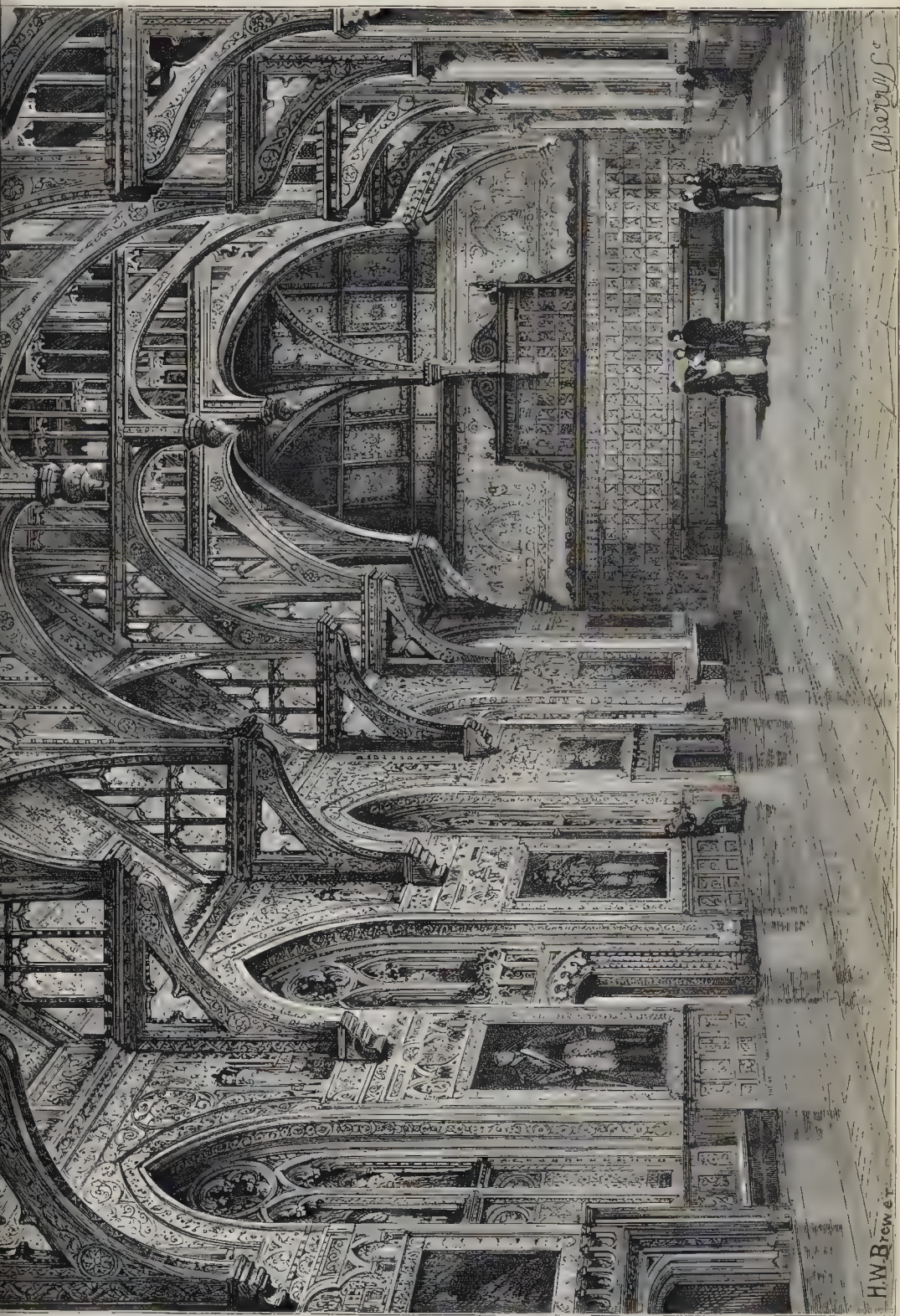












THE HOLLOWAY SANATORIUM, NEAR VIRGINIA WATER.—MR. W. H. CROSSLAND ARCHITECT.

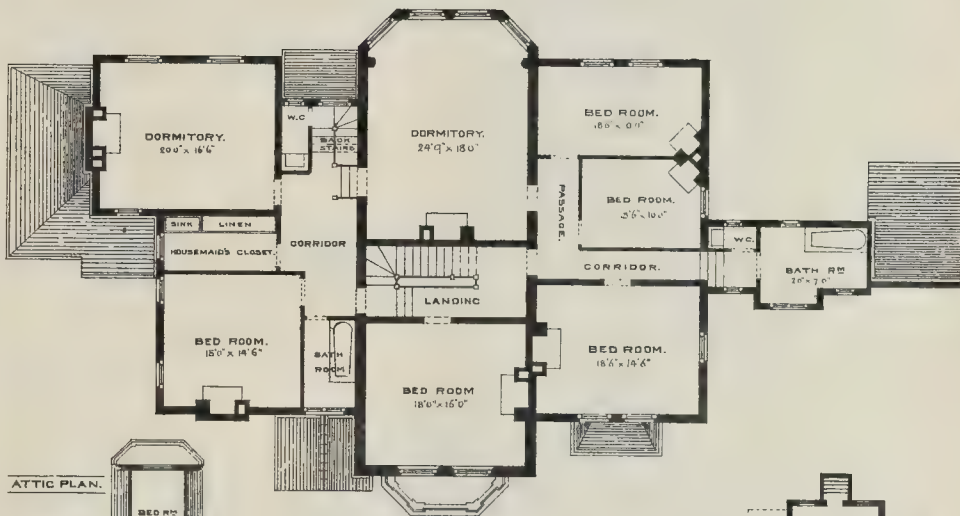
H.W. Brewer

W. H. Crossland

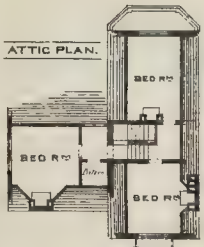




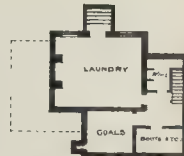
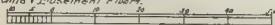




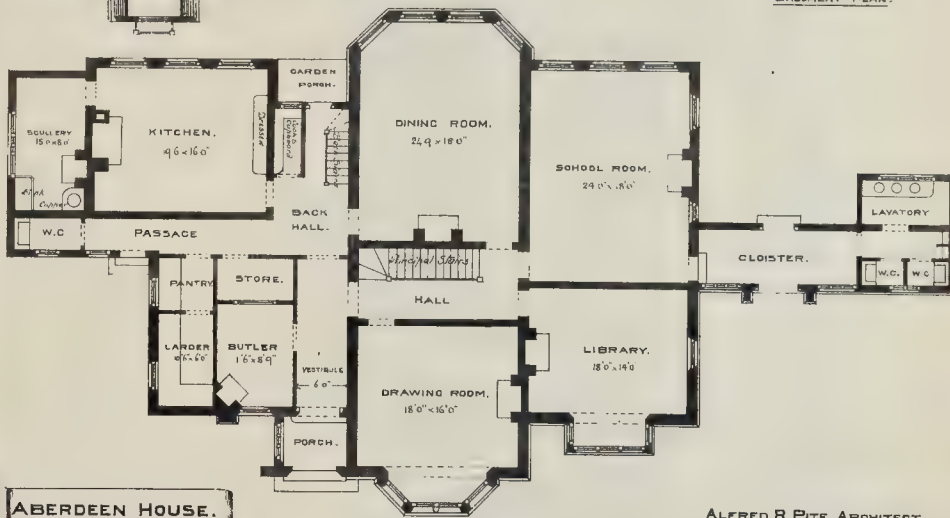
FIRST FLOOR PLAN.



Scale of 1/4" = 1'0" of Basement Floor.



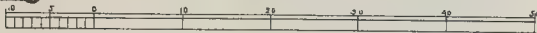
BASEMENT PLAN.



GROUND PLAN.

ABERDEEN HOUSE.  
RAMSCATE.  
THE REV. GEO. SIMMERS.

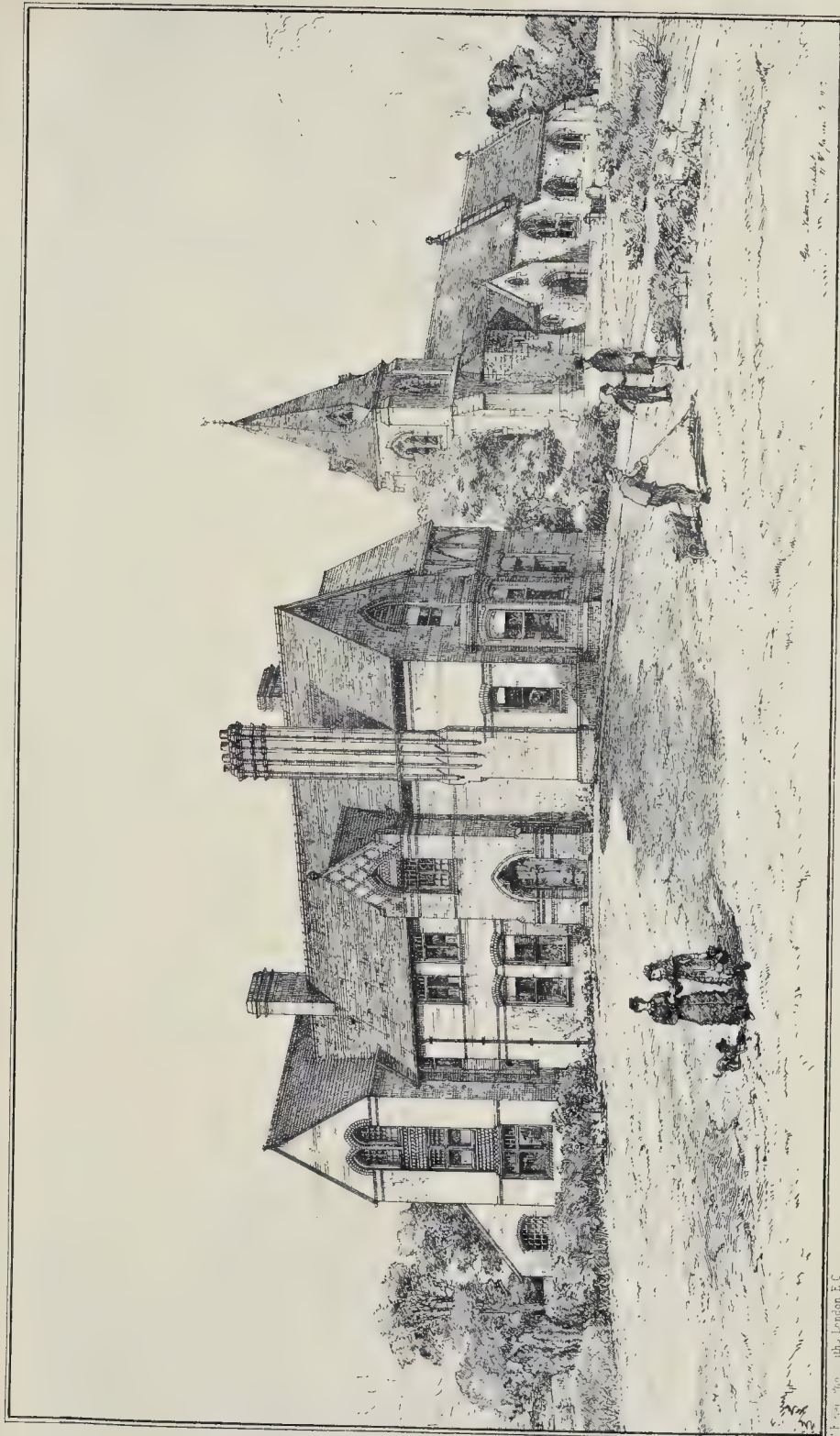
ALFRED R. PITE, ARCHITECT.  
44 BLOOMSBURY SQUARE, W.C.











BILLINGFORD RECTORY, NORFOLK.—MR. GEORGE NATTRESS, ARCHITECT.





## CHAPEL OF THE ROYAL BERKSHIRE HOSPITAL, READING.

We add to the illustrations given in our last volume,\* showing the new works at the Royal Berkshire Hospital, a view of the interior of the chapel. The fittings are being executed in walnut and pitch-pine, French polished. Messrs. Morris & Stallwood are the architects, and Mr. A. Sheppard is the contractor.

## ABERDEEN HOUSE, RAMSGATE.

This house has been recently erected in a most picturesque spot on rising ground, and has attracted considerable attention in the locality.

The instructions given to the architect were to provide a school-house so thoroughly domesticated in its arrangements that the dominant idea to the boys should be that of a comfortable home with all its accessories. The general distribution of the rooms was therefore made on the basis of a gentleman's house, with all its comfortable appointments. The billiard-room, fairly proportioned, was appropriated for the school and class-room, with cloistered approach and lavatory adjoining. The spacious bedrooms became small dormitories, with bath-rooms and water-closets located in each wing. Externally the treatment has been successfully developed in picturesque elevations well broken up, and the roof laid with Kentish tiles in bands.

The works have been carried out by Mr. Martin, of Ramsgate, under a contract including all the fittings and boundary-walls, for 2,900*l.*, from designs supplied by Mr. Alfred R. Pite, of Bloomsbury-square, London.

## BILLINGFORD RECTORY, NORFOLK.

Our illustration of Billingford Rectory, Norfolk, shows some variations from the conventional parsonage-house. A long and rather low building of red brick relieved with half-timber work, well grouped, forms a striking feature, situated as it is on high ground overlooking the valley of the Waveney. The accommodation provided, viz., drawing-room, study, spacious entrance and staircase halls, large kitchen, offices, &c., with six good bedrooms and dressing-room, will be deemed sufficient. When to these are added a coach-house and three-stall stable, boundary-walls, and road-making, and we are told that the total cost is only 1,700*l.*, we think the architect, Mr. George Nattress, of Great James-street, London, will not be reproached with extravagance.

The builder, Mr. G. Grimwood, of Weybread and Harleston, has carried out the works satisfactorily.

The work of restoring the adjoining Church of St. Leonard has been commenced, also under the supervision of Mr. Nattress. The rector, the Rev. Robert White, is making every effort to complete this work, but in consequence of the demands made for restoring adjoining churches, his task is an arduous, but, we trust, not a hopeless one. The village, on the borders of Norfolk and Suffolk, is of considerable antiquity, one of the chief Roman roads crossing the river Waveney at this place; and Sir Charles Lyell states the flint weapons, &c., found in the neighbourhood were unusually perfect.

**New Mill, Newport Pagnell.**—A new mill has been erected here for Mr. C. H. Whitworth. It is a substantial brick building of five stories, surmounted with a bold eaves cornice supported by moulded cantilevers, the roof being covered with slates. The dimensions of the mill proper are 53 ft. by 35 ft., and there are five floors, which are carried by iron columns and girders. Beyond this are the engine and boiler houses, together with meal-rooms, and smutting and sive rooms, the last being quite distinct from the mill proper. The machinery will include all the latest improvements. The corn on being taken to the mill is at once sent up to the top floor, and after that is not touched by hand until taken out as flour and other products. Messrs. Usher & Anthony, of Bedford, are the architects, and the works have been carried out under their personal superintendence by the contractor, Mr. Samuel Foster, of Bedford, Mr. Tomlin being the foreman. The machinery is by Messrs. Course, of Biggleswade.

## THE HOLLOWAY SANATORIUM.

THE attention of the architectural profession has of late years been greatly occupied upon the subject of asylums and homes for our unfortunate fellow-creatures who are afflicted with mental disorders, and it must be acknowledged that many improvements have been introduced into the arrangement and construction of such buildings. It happens, however, as a necessity, that these edifices, although often spacious and excellently planned, are very plain and unattractive from an artistic point of view. Either it is the ratepayers who insist upon the most rigid economy, and regard every piece of ornament as so much money taken out of the pocket of the public; or, if it is a private institution, the manager or proprietor insists that the outlay shall be only such as will repay him, and thus the architect is too often obliged to avoid decorative detail. There have been exceptions to this rule, but they are very rare; and certainly the notion of erecting for such a purpose a sumptuously decorated palace is a novel idea, for which the public have to thank the liberality of Mr. Thomas Holloway, of Tittenhurst.

The Holloway Sanatorium, although erected for the benefit of those who are suffering from mental disorders, is not intended to be devoted to the uses of an ordinary asylum for the insane. Its founder, Mr. T. Holloway, has attached to the establishment of this institution certain rules and conditions which are novel, and render the whole scheme one of great interest to the public. Amongst other points insisted upon, no patient will be allowed to remain an inmate of the institution for a longer period than twelve months; no patient will be received whose case is considered hopeless; no patient will be allowed to enter the Sanatorium after having been once discharged; and the patients received are to be of the middle class.

Now, the advantages of an institution worked upon the lines here set down must be obvious to all who are in any way acquainted with the question of mental maladies. In the first place, it is a well-known fact that madness is very often curable if taken in an early stage of the affliction. Secondly, it is exceedingly disadvantageous to those who are suffering from a temporary attack of this worst of all maladies to be associated with the class who are hopeless and incurable; and, thirdly, the establishment of such an institution for the use of the middle classes, is undoubtedly a great boon to the public. The pauper lunatic has his county asylum, and every confidence is felt that his case will receive the best medical treatment, and be open to investigation; but for the members of the middle class—for the unfortunate student who has overdone "cranning" for some public examination,—for the overworked barrister or clergyman,—for those whose minds are "filled with illusions" on account of domestic troubles or bereavements, there is no refuge but the public lunatic asylum, or the very costly and, we fear, from recent disclosures, often very unsatisfactory private asylum, the surroundings of such places cannot but exert a painful influence upon the mind already too highly strung, the associations with those who have been shut up for years must alone produce gloom and despondency. Now in the Holloway Sanatorium all this will be avoided.

We are informed that Mr. Holloway has expended 300,000*l.* upon the building and furniture, and has further endowed it with 50,000*l.* The object of the latter generous benefaction is that the institution (which Mr. Holloway presents to the nation) shall be conducted in such a manner that the charge for patients shall be so moderate as simply to cover the current expenses of the establishment.

We have considered it advisable to describe the exact purposes for which the Holloway Sanatorium is erected, because they, to a great extent, influence the plan and arrangement of the building.

The situation of the Sanatorium is remarkably picturesque, and being close to the Virginia Water Station of the London and South-Western Railway, is easily accessible. It is surrounded by twenty-two acres of freehold land, forming the crown of a gentle eminence, sloping away to the south, giving beautiful distant views over a richly-wooded country, diversified by charming undulation of hill and dale. Entering the grounds from the road leading to the station, and passing a very picturesque lodge, a wide gravel drive leads one to the principal front of the building, which consists of an

extended façade, 530 ft. long, having a boldly projecting structure in the centre, which consists of a great hall with a roof "hipped" at both ends, supported upon an open loggia of very solid Gothic arches. To the rear of this rises a tower of the Ypres type, 145 ft. high. The wings of the building are broken up by lofty crow-stepped gables, so as to form a series of separate groups of houses, yet all united together by the strings and horizontal members being carried over the whole design without any break. The object of this treatment is to show the internal arrangements which consist of a series of apartments, each isolated from the others except by the general corridor of communication. By this means it is quite possible to isolate any patient or class of patients from all the others, a point which has been kept in sight through the whole plan of the building.

In addition to the great central tower already mentioned, four smaller towers, crowned with open lanterns, mark the return flanks of the building and serve for purposes of ventilation. The material used is a fine red brick from Reading, with dressings, window tracery, &c., of Portland stone. Although the interior of the building is arranged, as we have previously noticed, for purposes of isolation, in necessary cases, yet this is rather to be considered as the exception than the rule, for a remarkably handsome dining-hall is provided, not unlike that of one of the colleges of Oxford or Cambridge; it possesses a very elaborate open-timber roof, and its walls are entirely covered with decorative paintings and arabesques. The latter were designed and executed by Mr. James Imrie. The kitchen, which is situated in close proximity to the dining-hall, is a fine room with an open-timber roof. The entrance-hall and principal staircase, the former under the great recreation-hall and the latter constructed in the base of the tower, are lined with ashlar, and communicate by three very richly moulded arches; the handrail to the latter is of grey marble. The whole surface of the walls is covered with painted decorations presenting a most sumptuous appearance. Such a combination of rich coloring and gilding is not to be found in any modern building in this country, except the House of Lords.

The grand staircase leads to the "Recreation Hall," which is the subject of our illustration, from which a notion may be obtained of the elaborate nature of the whole work. This hall measures 80 ft. by 40 ft., and is 60 ft. high to the ridge; it is lighted by seven two-light windows on the south side and by four on the north, the three remaining compartments on that side abutting on the tower. The centre is occupied by the principal entrance, and its two adjoining bays are adorned with panelled tracery of a similar design to the windows; the ends of the roof are hipped, and the difficulty of an internal treatment of a roof of this form has been overcome by a series of radiating principals which will be understood by referring to our illustration. As is usual in large Gothic halls, the roof is the most important feature. It is of the hammer-beam type, all the spandrels being filled with pierced tracery. The walls below the windows and at the east end are lined with drapery panelling in oak, and the windows filled with stained glass; every portion of this grand apartment is covered with decorative painting, gilding, &c., and a series of portraits of distinguished individuals is let into the walls. The Queen, Wellington, Nelson, Newton, Gladstone, &c., occupy the spaces at the sides; at the end is a striking portrait of the founder by M. Girardot.

The architect of the Sanatorium is Mr. W. H. Crossland, who has made a bold experiment in the design. Although at first sight the building appears to be a work of the fourteenth-century style, upon examination it will be found that elements are introduced from those of the thirteenth and fifteenth centuries. Although there is no direct authority for this admixture of the three styles of Gothic architecture in the same building, yet the works of the Italians who did not hesitate to combine the three Classical orders, and the many noble buildings of the sixteenth and seventeenth centuries, where we find Classical and Gothic forms united, seem to offer a suggestion for the formation of a new style which we have perhaps been too slow to avail ourselves of. It would be expected that a somewhat discordant effect would be the result, but we are bound to say that, in the Holloway Sanatorium, this is not the case, and we gladly welcome such a bold deviation from the beaten

\* Vol. xli., pp. 816, &c.



track, and trust that it may find imitators. If Gothic architecture is really to become a living thing amongst us, it does seem strange that we are not to be allowed to amalgamate the various beauties of its several styles in the same building. That the Medieval architects would not have scrupled to do this, seems certain from such works as we find at Ottery St. Mary's and the western portion of the nave at Westminster, where we find early forms of tracery combined with Perpendicular mouldings and capitals, though erected at the same date.

The rooms in the Holloway Sanatorium devoted to the use of the patients are handsome and cheerful. They are mostly lighted by large bow windows, and have their walls, ceilings, &c., decorated in flat colours, and the doors, architraves, &c., enriched with incised patterns and gilding. The windows are glazed in small panes. The number of rooms contained in the building is 480, which will afford ample accommodation to 300 patients, with attendants, servants, &c. All the offices are carried out in the same style as the principal building, and are alike constructed of fine red brick and Portland stone. They surround a square to the rear of the main building.

We wish just to draw attention to a peculiarity in the design of the building. It is the entire absence of ornamental carving, either in stone or wood, all effect of richness being gained by mouldings or coloured decoration. Some idea of the large scale of the building may be obtained from the following dimensions:—

Entire length of façade .....	530 ft.
Depth of the building .....	218 ft.
	Length. Width. Height.
	ft. ft. ft.
Recreation-hall .....	80 40 69
Dining-hall .....	61 32 49
Kitchens .....	66 24 24
Tower .....	39 30 145
Corridors .....	8 8 —

The architect is Mr. W. H. Crossland. The contractors are,—for mason's work, brickwork, plastering, plumbing, and slating, Messrs. Sharpington & Cole; for joiner's work, Mr. Lascelles; the stoves were supplied by Mr. Longdon; and the engineer's work is by Messrs. Phipson, May, & Underhay. Mr. George Martin, brother-in-law to Mr. Holloway, has, as representative to that gentleman, bestowed great attention upon the decorative painting executed at the Sanatorium; in fact, the general scheme of design and colour may be said to have been suggested by him, and the whole has been carried out under his supervision. The Sanatorium will be ready for the reception of patients by about May next, when Mr. Holloway will have expended 350,000*l.* upon the building and endowment. It is a noble and most generous benefaction to the nation at large, and must, we should think, be looked upon as a great blessing both to those who suffer from a temporary visitation of the most terrible of all maladies to which flesh is heir, and to the relations and guardians of those so afflicted. A father will feel terrible repugnance at committing his son to a mad-house, whereas the notion of sending him for a time to a sanatorium seems far less dreadful, and we can, in conclusion, only express a hope that Mr. Holloway's princely generosity may bring about the success which it so well deserves.

We should mention the fact that Mr. Holloway has just commissioned Mr. Crossland to prepare plans for a very costly and magnificent chapel to be erected in the grounds of the Sanatorium, for the use of the inmates of the institution.

#### REPORT FROM EDINBURGH.

As regards matters architectural in this city, the past year has been remarkable for the activity displayed in church extension. This activity has not been confined to any particular denomination, but has permeated the ranks of Churchmen and Dissenters alike, and the city is now encircled by sentinel outposts, each keeping zealous watch over the spiritual welfare of the dwellers in the surrounding district.

Æsthetically, none of the newly-built churches can be said to possess exceptional merit, although some of them have more than average attractiveness. Amongst those opened for service during the year, which we have described in our pages, reference may be made to the large and imposing United Presbyterian Church at Morningide, designed after the Norman manner, by Mr. David Robertson. It consists of a nave

with narrow aisles, which are used as passages only, and has a large hall in the rear, which has somewhat the effect of a transept. There is a tower at the north-west angle, which is the least satisfactory part of the design, but the substantial thoroughness with which the building is carried out is highly commendable, lath and plaster being only used in the subordinate parts, and not in the church proper. The ornate Gothic United Presbyterian Church at Canonmills, designed by Mr. Starforth, still wants the spire, which will form its most attractive feature. This church is planned after quite a different model from that at Morningide. It consists of a parallelogram, spanned by an open-timbered roof, and lighted by large traceried windows of varied design, and provision is made for the erection of a commodious hall in the rear. The site is an unusually good one, open on all sides. The perky German church close by is completed, spire and all, but the spire is quite out of place, being so insignificant as to produce no effect in the distance, and the body of the church seems to have been starved in order to obtain this feature.

Messrs. Hardie & Wright can scarcely be considered as having made a hit in the new Free Church at Ferry-road. A spire here would have been more in place than a tower, and the tower itself is poorly conceived. The same architects have better scope in the new parish church of West St. Giles, the site for which at Meadow-place is in course of being cleared from the encumbering buildings. The sum at command, exclusive of the cost of site, is 7,000*l.*, and the design shows large traceried windows and a high spire. Here, we think, a tower would have told to greater advantage than a spire, seeing that there are several spires in sight, but no tower, and the erection of such a feature would have proved a variety, and given a more marked individuality to the building.

Two cheap and serviceable churches, not without a certain architectural character of a distinctly Nonconformist type, have been designed by Messrs. Shiells & Thomson. One of these is an Established church at Darnliekies, and the other a U. P. church at Gilmore-place. A feature in the interior of these churches is the manner in which a wide span is covered by an open-timbered roof without internal support or outward buttressing.

One of the most singular churches we have seen is that designed by Messrs. Anderson & Brown, in St. John-street. The funds were comparatively small for the requirements, but rather more than were at command for some of the churches already named, and it would appear that these architects cannot produce much of an effect with restricted means. Quaintness appears to have been aimed at, but good proportion, which was surely attainable, has been ignored, and the block is clumsy and unattractive, as regards the exterior, at least. The interior is not yet completed, and we may have to refer to this building when it is so.

A new church, from the designs of Messrs. Hardie & Wright, has been opened, which occupies a site at the corner of Easter-road and Loebend-road. It comprises a nave, 96 ft. long, aisles, transepts, tower, and spire, and it is enriched with several stained-glass memorial windows designed by the Messrs. Ballantyne. The cost is stated at 4,000*l.* Little progress has been made with the Guthrie Memorial Church in Easter-road, or the U. P. Church at Colston-street.

Operations have, for some time, been suspended at the effective Episcopal Church in Jeffrey-street, designed by Mr. Hay; but the cause of delay, which, we understand, was of a monetary nature, has been got over, and the building will be carried out in its entirety.

Mr. Hay is prosecuting the restoration of St. Giles's Cathedral with vigour, and the whole interior, it is expected, will be opened out in the course of the ensuing year.

Considering the sum at his command (about 7,000*l.*), Mr. Raeburn has produced but a poor result in the new Free Church at Dalry; it is weak in detail, but pretensions withal. The temptation to have a spire, at any cost, seems difficult to resist, and here we have one which has little or no effect upon the landscape. If, instead of this spire, stone piers had been substituted for the paltrey iron columns which disfigure the interior, and a clerestory been added to the height of the building, a much more dignified effect would have been secured.

The most important and thorough of the churches in course of erection is that for the

parish of North Merchiston, which occupies a fine site on rising ground to the south of Slateford-road, opposite the new Dalry cemetery. Designed by Mr. Honeyman, of Glasgow, in the Early Pointed style, it will accommodate a congregation of 1,000, without galleries. The plan embraces a nave and aisles, with projecting organ-chamber, and a session-house and hall, occupying a frontage towards Slateford-road of 197 ft., with a breadth of 63 ft., and a height of 66 ft. The chief feature of the design is a spire at the north-west angle, which is only carried up to the springing of the gable, but which, when completed, will be an imposing structure, visible from a great distance and from different points of view. The east end bears the semblance of a chancel, and is lighted by three fine lancets, flanked by massive buttresses, and below these windows the wall surface is decorated with a blank arcading of clustered shafts.

There is no appearance of active measures being adopted at Viewforth towards the erection of the U. P. church, for which competitive designs were given in during the spring. Rumour has it that the accepted design is too large for the site, and that additional ground has had to be taken in, which will, of course, increase the cost, and probably necessitate a reduction of the outlay upon the building.

Of all the recent additions to the ecclesiastical edifices in the city, the most important is that of Mr. Anderson's new tower for Free St. George's, not only from its intrinsic merit as a design, but from the prominent and important position it occupies. At the west end of the city the skyline is broken by a remarkable group, of which the new tower forms an important item. This group is seen to advantage from several points of view, the best being from the high ground to the west of the Bank of Scotland, where the spire of St. Cathbert's, the tower of St. John's, the dome of St. George's, and the spire of St. Mary's Cathedral, combined with the new tower, in a very effective manner. The two lanterns which flank the U. P. church in Palmerston-place are of no effect in the distance, and if, instead of these, a tower had been substituted, the group would have comprised representatives of all the leading denominations of Scotland. But even as it is, this might yet be done, if funds were forthcoming, by raising a superstructure of two or three stages upon one of the lanterns; but we hardly look for this as among the range of probabilities.

We are glad to learn that the obstacles raised at the erection of a new chancel for St. John's by the proprietor of a portion of the burying-ground to the east of the church have been overcome. By the plan as now modified, the chancel will still be of the length originally proposed, viz., 25 ft., with a breadth of 21 ft.; but, instead of its being square at the east end, as originally intended (and which would have been the most effective arrangement architecturally), it will now be apsidal, with large traceried windows in each of the five sides. The roof is to be carried up to the full height of the clerestory, and the wall-head will be finished by a pierced parapet, and crocketed finials. The vestry for the clergy will form a low projection on the ground-floor, and the choir vestry will be placed under the chancel. A new entrance porch will be formed towards Princes-street, giving access to the vestries as well as to the north aisle of the church. The altar is to be placed against the east wall, and to be raised eight steps above the chancel, which will be laid with ornamental tiles, and fitted up with oak stalls. The alterations are to be carried out from the designs of Messrs. Kinnear & Peddie, at a cost of about 2,600*l.*

No additions of any importance have been made to the secular buildings of the city. The second instalment of the new medical classrooms for the University is being roofed in, and the principal façade to the north being now divested of scaffolding, the effect of the design can now be judged of, and it may be considered as highly satisfactory. The erection of the grand tower (which if carried out will be the highest in the city) and the College Hall are postponed *sine die*, but we have little doubt that those who so actively promoted the original scheme will not allow the matter to remain in abeyance for a long period.

The local authorities are again urging upon Government the necessity of completing the Museum of Science and Art in terms of the compact entered into when the neighbourhood



was improved at the cost of the city. According to the *Scotsman*, the Irish, by dint of clamour, receive more from the Exchequer on account of public buildings in Dublin than the Scotch receive for the same purpose in Edinburgh, although the revenue derived from Scotland is much greater than that from Ireland. The operations at the new Conservative Club have not progressed beyond the foundations, but as the club has obtained a decision in its favour in the dispute as to the height of the building in the rear, the obstacles which impeded progress may now be considered at an end, unless the case is appealed to a higher tribunal. We notice a very ornate specimen of Free Classic street-architecture making rapid progress at the south-west angle of Hanover-street and East Rose-street. It is, apparently, intended for business premises, the ground-floor to be occupied as shops.

#### ARCHITECTURAL SOCIETIES IN SCOTLAND.

At the annual dinner of the Edinburgh Architectural Association, on the 22nd ult., Mr. John McLachlan, architect, president, in the chair, Mr. John Honeyman, president of the Glasgow Institute of Architects, proposed the toast of "Success to the Edinburgh Architectural Association." After alluding, in appropriate terms, to the loss sustained by the death of Mr. Street, Mr. Honeyman spoke of the value to the profession of union and organisation, and in the course of his address said:—

It is exactly thirty years since I was admitted a member of the Architectural Institute of Scotland. I felt much interested in its work, and had little doubt about its success. Its professed object was exactly the same as yours,—exactly the same as that of the present Glasgow Institute. This, indeed, is expressed in the laws of the old Institute and in ours exactly in the same words,—"The Advancement of the Art and Science of Architecture." The Institute did good work for a few years, and then it gradually began to show signs of weakness. There were twists and ugly separations, indicating something wrong with the foundations, and at last it suddenly collapsed. This collapse had one bad result,—it caused alienation between the architects of Edinburgh and Glasgow, and I think I may safely say that they have never been such good friends since; but, on other grounds, the split was not to be regretted, and it would certainly be entirely wrong to say that it was caused by the petty jealousies and animosities of the professional members. The causes of the Institute's dissolution were inherent in its constitution. Being a national institution, it was right that its headquarters should be here; and it was natural, though not right, that a majority of its council should belong to Edinburgh. The Glasgow section was thus controlled by the Edinburgh section, and as the former comprised a majority of the fellows and of the other members, the situation soon became irksome, and at last unbearable. Now, doubtless, if the Institute had confined its efforts to the promotion of the union of the profession in Scotland, and the elevation of the qualification and status of its professors, or to the enlightenment of public opinion on matters architectural through the agency of its mixed membership, more skilful management might have averted its fall; but while in themselves commendable in the highest degree, such pursuits are but a small portion of the work of any architectural society worthy of the name. Your own experience, gentlemen, as members of this Association, must bear me out in this,—that an architectural society must have much work to do of merely local interest,—work educational, deliberative, or, it may be, actively defensive or offensive (not using the word offensively), the importance of which men at a distance cannot realise, and in the conduct of which their interference would be impertinent. And so we should not be surprised to find,—indeed, it is exactly what might have been expected,—that it was differences of opinion about enterprises of local utility which brought matters to a crisis and led to the disruption of the Institute. Its history has, I think, a lesson for us now, and I therefore trust you will not blame me for saying so much about it. That lesson seems to be this, that provincial societies are most likely to be useful in their respective spheres,—to be vigorous, influential, and long-lived,—if they are responsible for the manage-

ment of their own affairs, and are entirely free from any extraneous interference. I have not the least fear, moreover, that such independence will lead to selfish isolation and indifference to matters affecting the profession as a whole; on the contrary, independence, if it does not beget benevolence and all charitable emotions, acts well as their foster-mother; and without doubt it is the parent of respect,—respect for our fellow-workers, respect for ourselves, and hence a reciprocity of good will and esteem, the solid and only basis of that union which is strength. But, gentlemen, if we desire our profession to obtain what I may call national recognition, and to stand out among others in its true position and dignity,—if we wish as a profession to give authoritative expression to our opinions; to encourage the highest culture, and to provide the most excellent facilities for education and research; to maintain friendly relations with our brethren in other countries; to be entrusted by the Legislature with certain useful functions, and by our sovereign with the distribution of honours, the gracious bestowal of which testifies to her continued interest in our art,—I say, if we desire, as a profession, to perform such duties, and to enjoy such privileges, you must be perfectly sensible that it is impossible for us to do so through the agency of independent isolated local associations; and hence, on the one hand, the fitness and the need of one great national association, and on the other the duty which rests upon every architect to give a loyal and hearty support. The want of this, too, generally,—the want of it, I may say, especially, in the good city of Edinburgh,—is the only reason why the Royal Institute of British Architects is not a still greater power in the country than it is. Its influence during the past years,—now nearly fifty years since its establishment,—has been great and beneficial, and it gives every promise of increased usefulness.

#### THE RUINS OF CARROW PRIORY, NORWICH.

The members of the Norfolk and Norwich Archaeological Society recently visited Carrow Priory, by permission of Mr. Colman, M.P. (the owner) and Mr. Tillet, M.P. (the occupier).

Mr. R. Makilwaine Phipson read a paper on the remains, specially referring to recent excavations on the site. Mr. Colman, he said, had been most liberal, and had spared no expense in the work of discovery; but he could not lay bare the whole of the ruins, to do which would necessitate the digging up of the whole of Mr. Tillet's garden, a proceeding to which, much as he desired to trace the walls, he should decidedly object if the property belonged to him. However, archaeologists must all feel grateful to Mr. Colman for what he had done. Before proceeding further, Mr. Phipson referred to the services of Mr. A. S. King, of the building department at Carrow, who had, in the most painstaking manner, worked most carefully and conscientiously in exposing the foundations of the Priory, allowing nothing to be wantonly disturbed or destroyed, and taking the greatest interest in the discoveries made. There was a hospital at Carrow in the time of King Stephen (perhaps earlier) dedicated to St. Mary and St. John. As King Stephen gave lands and meadows, in 1146, to Seyna and Leofolins, who founded a "new" priory, it may be assumed that some institution of the kind pre-existed at Carrow. The Priory was occupied by nine Benedictine black nuns, who were endowed, according to Dugdale, with 64*l.* 16*s.* 6*d.* a year; but according to Speed, with 84*l.* 12*s.* 1*d.*, exclusive of their lands, which, twice as valuable, would bring up the income to between 200*l.* and 300*l.* a year, representing from 1,000*l.* to 1,500*l.* of our money value. In 1199 a fair of four days was granted to the Carrow Priory. The last prioress but one was Isabella Wygun, during whose time the domestic apartments, now occupied by Mr. Tillet, M.P., were erected. Her rebus, Y and a gun, carved on the woodwork of the house, indicates its date. Cecily Stafford, the last prioress, was pensioned at the dissolution on 5*l.* per annum. There were twelve nuns in the house at the time of the dissolution, and these ladies, it was stated, kept what was, in fact, a high school of the most select kind. Old Fuller lamented the breaking up of these "shee schools," which, if continued, might, he says, "have heightened the weaker sex to a higher perfection." The nuns had the patronage of

St. James at Carrow. Where that church stood is not known. Some thought it was the nave of the Priory church,—the nuns reserving to themselves only the chancel and transepts; but that is doubtful. Mr. Phipson went on to say that it might be taken generally that this Priory existed from the middle of the twelfth century to the middle of the sixteenth century. For three centuries and a half the remains of the Priory had been lying beneath the soil, neglected and unknown; and now that they had been brought to light, he feared that one or two winters like the last would reduce nearly all to powder. Whatever Mr. Colman might do to preserve them, they certainly would not last another 300 years. If therefore behoved archaeologists to transmit to their successors accurate descriptions of the remains. For this reason his friend and assistant, Mr. Wallis, had, by the kind permission of Mr. Colman, made a most accurate plan of what had been exposed. The ruins were of many different dates, from the twelfth to the sixteenth century. Each religious order had, to a certain extent, its own particular plan of building; and as this priory belonged to the Benedictine order, as to their buildings elsewhere we must look principally for the key to its arrangements. The chief feature was the cruciform church, dedicated to the Blessed Virgin and St. John the Evangelist. It consisted of a nave, 101 ft. long and 24 ft. 3 in. wide; north and south aisles of similar length, and 11 ft. wide; a central tower, 32 ft. square on the outside; a choir arch-chancel, 62 ft. 6 in. long and 23 ft. wide; a south chapel, dedicated to St. John the Baptist; a north chapel, dedicated to St. Catherine; and north and south transepts, extending 42 ft. 6 in. beyond the tower, and 23 ft. wide. The church was about one-fifth larger than that of St. Peter Mancroft. On the east side of the south transept, the usual place in most Benedictine buildings, was the sacristy. It had a wide arch and an altar, the almost invariable feature of a sacristy. The church appeared to have been begun, as was frequently the case, at the east end. Chancel and choir were first erected, then the tower and transepts, and finally the nave and aisles. The chancel, choir, tower, and transepts were certainly built in the latter part of the twelfth and the beginning of the thirteenth century; whilst the nave and aisle were Early English work of the middle and later part of the thirteenth century. The eastern part of the chancel was raised two steps, still remaining, and the east wall was doubtless filled with three single-light semicircular-headed windows in deep reveals. The western part of the chancel contained the Cantus Cantorum, the walls of which were highly enriched with stone arcading. Then came the massive tower, one pier of which was entirely gone. Here begin traces of work of the early part of the thirteenth century. The walls of the transepts were also arcaded, with a rubble wall seat all round, a common feature at the time. Further west is pronounced Early English work, the base of a pier being left pretty perfect, but the foundations of the remainder had not been discovered, and perhaps were entirely gone, as they were frequently laid upon the surface of the ground. Near the west end of the church is a wall of fifteenth or sixteenth century work. Mr. Brook called this part walled-off a narthex, and so it may have been in the fourteenth, fifteenth, or sixteenth century, but it was clearly no part of the original church. The walls of the north and south aisles were arcaded in stone and returned round the west end. As nearly the whole of the walls of the church were thus arcaded, some idea might be formed of the richness and beauty of the interior. The old west wall shows no sign of a west entrance; and it is possible there was only a large west window. There was evidently a door, with a porch, in the north wall. On the south side were two doors entering into the cloister, used mostly for processional purposes. As no extensive abutments have been found, while the outside walls are thin, Mr. Phipson fancied that the church was not roofed with stone groining. The proportions of this church were all worked out to a mathematical nicety on the simple basis of tenths. The length of the nave from the centre of the tower was six-tenths, of the chancel and choir four-tenths, and of each transept three-tenths. This showed that our ancestors did not work by rule of thumb. On the north side of St. Catherine's Chapel are remains of walls, foundations of buildings used for secular purposes. Under these walls were found three



shallow circular sinkings and an oval one, varying from 10 ft. to 12 ft. deep. These buildings might have been occupied by the priest who conducted the services of the church; possibly they form part of the anchorage, though there was a tradition that it was situated on the sloping ground to the south-east near the main road. Lady Julia Lampet was anchoress here in 1528. At the end of the south transept was a fifteenth or sixteenth century wall. Possibly the inmates by that time wished to have a straight staircase to their dormitories; but the original staircase to those rooms was circular, for the two first steps still remain *in situ* on the east side. This circular staircase led up from the slype, which formed a communication between the cloisters and the outer ground and detached buildings, and always intervened between the transept and chapter-house. The chapter-house, which ran east and west, had a groined ceiling, the central portion springing from columns in the middle of the room. It had a door into the cloisters, and was 37 ft. by 23 ft. Beyond was the day-room, which also had a groined ceiling, and was divided with columns, from which the central groining sprang. In this case the columns were circular shafts, a portion of one of which still remains. Seven of these formed eight bays, which still can easily be traced by the corresponding corbels in the walls from which the other side of the groining sprang. Over the chapter-house was the scriptorium or library, lighted by a window to the east. Over the day-room was a long dormitory. Subsequently, when the Prioress became more luxurious, special rooms were built for herself and those immediately connected with her. To the east of the day-room and dormitories stood the hospital or infirmary, the site of which has not been excavated. That probably consisted of a day-room and dormitory, with small kitchen and offices, and was reached by a covered passage leading from the day-room. On the north side of this passage were the gongs. Close by, on the east side of the chapter-house, was a burial-place. Most of the nuns were probably interred in the centre of the cloister. But in this burial-place are three graves, in one of which, at a depth of 2 ft. 6 in., human bones were found, evidently those of a female, buried without either stone or wood coffin, a thing very usual in the twelfth and thirteenth centuries. The slab on one grave is evidently from the cross upon it, of the latter part of the thirteenth century. On the south side of the church, and on the west side of the chapter-house and day-rooms, were the cloisters, now Mr. Tillet's garden. In the wall still remains a holy-water stoup; no doubt there were also lavatories. On the south side of the cloisters were the refectory and kitchen, with chambers over: and on the west side was originally the *Domus Conversarum* (Conversi), or the house of converts, and rooms for workpeople and servants. Mr. Phipson imagines these were pulled down, and, early in the sixteenth century, a portion of the block of buildings now occupied by Mr. Tillet erected by Prioress Wygyn. This house consisted of a parlour handsomely panelled in oak, with a fine moulded oak beam ceiling (Mr. Tillet's breakfast-room), and above was a bedroom reached by a turret staircase, still existing. There were also a guest-chamber and other necessary offices and accommodation suitable for the position of a prioress whose notion of living was more luxurious than that of her early predecessors.

A vote of thanks having been given to Mr. Phipson for his paper, Mr. Colman, M.P., said that Mr. Phipson's opinion as to the effect which time and weather would have on the ruins rather confirmed him in the resolution not to proceed further, and to leave further discoveries, should anything important be unreserved, to future generations.

**The National Society for Preserving the Memorials of the Dead** has now been organised, and has made, we are told, considerable progress. Its object is to preserve and protect the memorials of the dead in the parish churches and churchyards of Great Britain. The rules of the society suggest various ways of accomplishing the work,—e.g., by securing a record being made of sepulchral memorials now existing, &c. We observe that the late Mr. G. E. Street, four days prior to his death, had accepted the post of honorary architect. The secretary is Mr. William Vincent, Lower Helleston-road, Norwich.

#### A NATIONAL HISTORY GALLERY.

SIR,—“The Decadence” that succeeded the great period of Italian art is to be attributed rather to the great political and religious changes which were taking place than to the artists of the period, who were compelled to bow to a new order of things, to the new kind of art-demand that was then made upon their talents. The long-continued demand that had been made upon the genius of the Italian painters and sculptors of the fourteenth and fifteenth centuries by the Church and the wealthy merchant prince, for series upon series of extensive mural and sculptural decorations, ceased, and with the termination of this kind of art-demand, monumental painting and sculpture may be said to have expired. Thenceforth the demand for the practice of the fine arts was of a more fitful character, and for art of a less elevated style, for disconnected easel pictures, *pieces d'occasion*. This new order of things attained its climax in the wealthy Netherlands, in Spain, and in France, and from these sources English art derives the fashion of its art patronage and of its art practice. The extreme point of erratic departure from the old forms of encouragement and practice was attained when it came to be supposed that the mere collecting of specimens of ancient art in National Galleries, museums, and mansions was the true way of promoting the revival of the fine arts. This more modern kind of procedure has so long been accepted without being questioned that it now appears to public men and to the *dilettanti* to be the right and natural course to pursue, though the history of the fine arts ought, long ere this, to have taught them that this was not the means by which the two greatest art developments were accomplished. It behoves them, therefore, to consider whether it would not be advisable, and in the best interests of art, to return to the more ancient mode of procedure of art encouragement, whilst the national life is at its full.

In the great art-epochs, painting and sculpture were, as a rule, associated with architecture. It was so in pagan Greece, and in Medieval and Christian Italy, and it is to this intimate association of the three sister arts that we may reasonably attribute the high state of excellence to which painting, sculpture, architecture, and the art-manufactures attained in those two famous epochs.

But how, it may be asked, are we to bring about this intimate association of the three arts in these days, and in England? The Church makes no great demand upon the exercise of the fine arts, nor does the State, nor do the nobility; that is to say, we are at present without any powerful incentive to develop historical painting on a grand scale; nor can we look forward to our future departmental edifices as at all likely to afford greater scope than heretofore for mural and sculptural decoration, it being a *sine qua non* that in design they shall be rigorously adapted to their purposes, a condition, as aestheticians well know, which does not necessarily involve apocryphousness to taste.

Our object, therefore, should now be to find, to make, opportunities fit for the development and display of historical painting on a grand scale; for this is precisely the class of painting which, more than any other, requires encouragement beyond the means of private patronage. The want of such encouragement has long been regretted, not by professors only, but by all who have turned their attention to the state of painting in England,—a proof that the promotion of historic art is an object of interest with a considerable portion of the public.

Mural painting being employed to decorate large and solid surfaces, the artist is no longer intent upon the reproduction, however ingenious, of reality in its most limited sense. A dignified subject is essential, and to this genius is required to add ideality or elevation of treatment. Lastly, simplicity, the indispensable characteristic of great works, must be apparent in the composition and the execution. Hence arises the special condition of excluding from mural painting all that may interfere with grandeur of effect, all that aims at literal imitation and illusion; it follows, therefore, that the treatment of subjects fitted for large dimensions must tend to ennoble the style and taste of the artist of the National School of Painting.\*

\* It may be gathered from the *Life of the late Prince Consort*, and from the reports of the Royal Commission of the Fine Arts, that the Prince earnestly desired that the art of mural painting should be encouraged.

In view of the foregoing arguments, it would, therefore, appear to me to be highly desirable that we should have a class of public building designed entirely for the adornment of the metropolis,—a class of building devoted solely to the purposes of taste; to subserve, in fact, those art purposes which were fulfilled by the Grecian temple and the Italian cathedral and palace; a class of building that should be National Galleries in the fullest sense,—galleries in which the people would take a deep interest from the fact that they would contain illustrations of subjects of vital interest to them, painted by living artists.

In furtherance of these objects, I, therefore, beg leave to bring more prominently forward a project which I first broached in the columns of the *Builder*, in 1875, for the erection of a National History Gallery, to contain a series of historical paintings, illustrating the most important incidents in the various periods of English history. Each hall or gallery to be devoted to a particular period. The arrangements of the suite of galleries should also afford opportunities for the display of the sculptor's art. The series of galleries to be linked together with consummate architectural skill and taste, and the whole building designed to be an ornament to London. Such a public edifice would not only be a popular and inspiring holiday resort, but either a grand or a beautiful National Monument.

W. CAVE THOMAS.

#### THE ARCHITECTURAL FUTURE.

SIR,—As the active, brilliant, and successful career of the late Mr. Street can scarcely be without its beneficial influence on the future of English architecture, it may be of some advantage for men of less commanding ability if they can discover the secret of his success, in so far as it was independent of the genius with which he was endowed.

What, then, we may inquire, was the chief characteristic of his professional practice,—what the most striking lesson to be derived from his example?

Unquestionably, as I think, it was his rigid and faithful adherence from first to last, in all his designs, ecclesiastical as well as civil, to one style,—the national style of his own country and of Western Europe.

He was evidently convinced that Gothic architecture possessed all the elements for perfect adaptation to the requirements of modern civilisation, and that, being based on principles everlastingly true, it had such vitality within itself that it could never become tame or spiritless or uninteresting however long its votaries asked it for inspiration, even if worked at to the end of Time.

He knew, however, that no mere antiquarian draughtsmanship would do,—that it was not enough to create mere reproductions, however faithful and exact. Neither his genius nor his wonderful industry would permit his stooping to this, and so, while there was no more earnest explorer of the old architectural glories of the past, whether in England, Germany, France, Spain, or Italy, he was ever ready in his professional practice at home to enrich and harmonise his work with new ideas (without fear of the taunt that this was modern, or that that was without ancient authority), to introduce new or forgotten materials, as in the Jasper monument at Lichfield, the inlaid coloured marbles at Wimbledon, the alabaster screens at Eastbourne and elsewhere, and the free use of granite and porphyry. In a thoroughly catholic spirit he encouraged the application of modern science, knowing well that the architects of old neglected nothing that could aid in the advance of their art. Moreover, he was boldly eclectic, with the reward that the buildings with which he has adorned English cities, towns, and villages were ever increasing in interest, beauty, and originality. So entirely satisfied was he known to be with the capabilities of his favourite style to meet all wants, that to have seen a design by him in any other style on the walls of the Academy would have given the beholder something like an electric shock.

If there is no over-statement in all this,—and I think there is not,—we have an absolute proof that by the adoption of one style for a lifetime, and carrying it out on the same true principles as in past times, the greatest success will be secured, not only professionally, but, if all allied, in the creation of a really national style of architecture truly representing the advanced state of



modern civilisation. "L'union c'est la force," and "We are the heirs of all the ages." At all events, so worked Phidias and Ictinus in Greece, Anthemius and Crysolaus in Byzantium, Arnolfo Pisano and Brunelleschi in Italy, Robert de Conoy and Eudes de Montreuil in France, and Jocelin, Elias of Dereham, and Wykeham in our own England. The Greeks, indeed, the most brilliant and accomplished race that ever existed, worked untiringly at a single style for 500 years, and they were rewarded in the end by producing the most perfect edifice built by man. May we not conclude, then, that our lamented brother has left us an example well worthy of being adopted, and that if we all worked in the same spirit, and by general consent could accept one style for all purposes, a national architecture, magnificent and beautiful, would in due time be the result?

HENRI DE SIVART.

#### WHO WAS THE ARCHITECT OF ASHBURNHAM HOUSE?

SIR,—In the course of a discussion on this subject in your columns last July, I expressed the opinion that the ascription of the design of this house to Inigo Jones dated about the beginning of this century only. In thus writing I had in mind the earliest representation of the house I had then been able to find,—a plate in J. T. Smith's "Westminster," from a drawing made in 1808. On this it is stated that the house is "said" to be by Jones. This looked, therefore, very like the origin of the modern ascription to him. I may add that in the catalogues of two very extensive collections of Old London prints, &c.,—the Grace collection and that in the Guildhall Library,—I could find nothing earlier than this engraving. But after searching through all the better-known books, I found at last that of which I was in quest in a small quarto volume, "Designs of Inigo Jones and Others: published by I. Ware." Plates 6 and 7 give the plan and section of a staircase by Inigo Jones. Though not so stated, this is evidently the staircase of Ashburnham House. The date usually assigned in catalogues to this undated volume is 1756, but in the Soane Museum, in which are Ware's original drawings, is also a copy of another edition of the book dated 1743, and this is clearly later than the undated one. In Hoppus's "Palladio," published in 1735, are many engravings evidently taken from Ware's book, to which we may therefore safely assign a date somewhat earlier than 1735.

If we proceed to estimate the value of this evidence, we shall find it to be very strong. To begin with, the fact that as a mere question of date there was, in 1735 or thereabouts, nothing improbable in ascribing the house to Jones, clears off a number of possible competitors. And, considering further the admitted beauty of the design, it may well be doubted whether, with this limitation, we could possibly ascribe it to any but Jones or Wren. For, as Mr. Ferguson well says, "Wren may have been greater in construction, but was not equal to Jones in design; and we look down the ranks from that day to this without finding any names we can fairly class with those of these two great men" ("History of Architecture," second edition, iv., 293). But Ware was, as is shown by others of his books, a zealous student of the works of Jones, and in this particular book there are indications that he was working under the guidance or patronage of Kent and the Earl of Burlington, also ardent admirers of Inigo. Wren at this time had not long been dead, and the memory of his works must yet have been fresh. Moreover, Ware for many years had for a colleague in the Board of Works, Hawksmoor, a pupil of Wren, and the most worthy of his imitators. Still further, Ashburnham House is generally supposed to have been designed for a member of the family of that name. At all events, the house had been for many years in the possession of the family, when, in 1730, it was sold to the Crown by John, the third lord and first earl, who died in 1737, after the date of the publication of Ware's book. It is, therefore, clear that Ware had open to him many sources of information, which we do not now possess.

The attribution to Jones of the design of Ashburnham House is confirmed by Sir John Soane,—no mean judge,—who, in several passages in his lectures at the Royal Academy, refers in terms of the highest praise to the staircase. These lectures are now in the Soane Museum,

together with a series of very fine drawings of the staircase and a ceiling in Ashburnham House.

I should add that plate 24 of Ware's book shows as Jones's the small summer-house, in form of a temple, built against the wall of the old refectory of the Abbey; and that in plate 23 is a representation of the alcove in the dining-room. The latter is the only anonymous design in the book, and Ware's practice in such matters leads me to infer that this absence of name is intended to convey that this is his own design.

It is not a little singular that an alcove similar in design to that in Ashburnham House is to be found in another London house by Inigo Jones,—Lindsey House, Lincoln's-inn-fields. I am inclined to think that this is also by Ware. It bears the arms of the Shiffner family, a member of which was, as I find by the *Gentleman's Magazine*, a resident in Lincoln's-inn-fields in 1759. Ware died in 1766.

I may add that, having been most kindly permitted to examine Jones's drawings in the possession of the Duke of Devonshire, I found among them nothing relating to Ashburnham House. There is, however, a design for a ceiling and lantern with columns for Wilton House, which decidedly recalls these features of Ashburnham House.

It came out in the recent controversy about Ashburnham House that the doubts as to its design being by Inigo Jones were suggested by Sir Gilbert Scott. But I do not think that even the warmest admirers of Sir Gilbert would claim for his opinion on a question of Classical architecture weight sufficient to disturb an ascription received, as I have shown, for at least 150 years, supported by the testimony of those so well fitted to judge, and whose means of acquiring correct information were superior to ours.

ALFRED MARKS.

\*\*\* We will give an engraved view of the staircase in an early number.

#### PUBLIC SAFETY IN CASE OF FIRE OR PANIC.

SIR,—I have, for a long time, thought that most theatres and public buildings with galleries are badly planned; many architects have lost sight, to some extent, of the heading of this letter.

I have suggested and advocated the open-street stairs, all outside main walls of building. Let every floor or gallery have its own double staircase, if only on the main front; let the stairs run down each way, with sufficient landings, and on the landings bays, so that the weak may have a chance to stand aside.

A staircase each side for each floor or gallery would be better. Also have to all entrances an extra pair of doors, and let all doors be hung to open outwards. If extra doors are not needed for general use, let all bolts be drawn when the place is used.

Of course it would be the inspector's duty to test occasionally these extra ways of exit.

Staircases arranged in this manner, open to the street and supported on columns, piers, and arches, one above another, could be made to look well, and would, to some extent, dispense with many cornices, pilasters, and columns that support nothing in particular.

It is in the boxed-up winding-stairs that the struggle and many accidents occur; but when people find a straight stair and open to the street, a great amount of fear (naturally) would be lost.

W. T. CHINGHEN.

#### THE CHANNEL TUNNEL.

A NEW shaft for the Channel Tunnel has been commenced at the eastern end of Shakspeare's Cliff, on a small piece of land just outside of the South-Eastern Railway Tunnel, the operations being conducted by an additional party of miners and labourers. The work will occupy some considerable time before the shaft can be used for the purpose for which it is being constructed. When the shaft has reached the required depth, which will be something like 200 ft., a heading will be cut to see to meet the present main heading, which started at Abbott's Cliff, some two or three miles to the westward, the object of the new heading being to obtain an additional outlet for the debris from the main cutting. At present, only two trolleys can be employed for removing the chalk, but with the additional heading this number will be at least doubled.

#### FORECOURTS: THE BOARD OF WORKS' ROADS.

SIR,—In a letter which appeared in your issue of the 24th of December, Mr. Thomas Harris refers to projections from the line of house-fronts in existing thoroughfares, and argues that it is a great hardship that any restriction should be exercised beyond the limit of 10 ft. or 15 ft. of the footway.

It is a most remarkable fact that, however desirous owners of property and governing bodies may be that London should possess, in some of its thoroughfares, magnificent widths and opportunities for picturesque display, there will always be found individuals quite ready to decry those exertions, and to condemn all attempts which do not include the covering of the greatest possible area with bricks and mortar. Is it not a lamentable reality that in some of the roads of London, originally designed, at the expense of great personal exertion and loss of ground-rent, to give Londoners a taste of the Parisian boulevards, the predecessors of Mr. Harris have succeeded in destroying the grand projects, and in gradually but surely reducing the forecourts to the wretched 10 ft. or 15 ft. which they advocate.

Take, for example, the Easton-road. When the Bill for making this road (then called the New-road) was before Parliament, a clause was inserted "prohibiting the erection of buildings, or any erection whatsoever, within 50 ft. of the road, and empowering the parochial authorities, upon obtaining an order from a magistrate, to pull down and remove any such erection, and levy the expenses thereof on the offender's goods and chattels, without proceeding in the ordinary way by indictment." That clause led to the laying out and planting gardens in front of all the houses erected on either side of the road, with a pleasing and picturesque result which now can be imagined only. Persons acquainted with this road remember that bit by bit encroachments have crept up, first, the simple wooden erection of the height of the shop only; then the gradual strengthening of the supports, and the quickly following superstructure, until advancing to the utmost limit of even public convenience (in some places barely Mr. Harris's 10 ft. or 15 ft.), the huge structures, such as that of "Baker's," at the corner of the Easton and Tottenham-court roads, the "Coat and Compasses" in the Easton-road; and, of course, as public-houses are never behindhand in encroachments, the "King's Head," the "Adam and Eve," and others, must needs add their forward ways to the quota; in fact, all along the line the determination seems to be that London shall not, at least in the Easton-road, be anything but five-story buildings, 40-ft. roads, and 10-ft. footways.

And what does all this show? In my opinion it proves that, instead of the Metropolitan Board of Works being guilty of "unnecessary interference with the rights of owners," as Mr. Harris would endeavour to make out, it is guilty of unnecessary toleration of the paltry utilitarian who considers nothing so much as building land at the greatest possible price per foot superficial. Why, even when golden opportunities occur, as in the formation of new streets, for giving the public a little benefit in the way of open spaces and picturesque laying out, what does the Metropolitan Board consummate, but miserable failures,—in line, in level, in direction,—seeking nothing, and apparently knowing nothing, but the inevitable "so much per foot super." I challenge any man with an eye to point to any one street laid out by the Metropolitan Board which leads anywhere, which has any sort of line, or which indicates the remotest attempt at giving the public a taste of what is the admiration of every lover of the beautiful,—a Continental boulevard. Look at Northumberland-avenue, opening up at one end the exquisite adjuncts of the South-Eastern Railway, and at the other, after tumbling up and down in level, artfully missing the centre line of the Nelson monument; badly lighted, with dangerous crossings, and with land for years unlet because the officials believe they know better than anybody else what is its value at per foot superficial. Look at the Clerkenwell-road,—will any kind person tell me to where that leads, which is the new street, and which is not, and when we may hope for anything decent in the way of architecture therein? And what about the new coup at Piccadilly-circus? Shall we know to where that new street leads, shall we have, as we ought to have, a picturesque



open space there, or will it be the inevitable so much per foot superficial? But I am digressing, air, and can only conclude by hoping that Mr. Harris and his followers will ultimately have to give way to a strong local government, which will not regard 10 ft. between curb and building as the some of well-designed thoroughfares.

WM. WOODWARD.

#### MEMORIAL OF THE LATE SIR G. P. COLLEY.

A MEMORIAL window to Sir George Pomeroy Colley, who fell heroically fighting on Majuba Hill, has just been placed in Stoke Church, Guildford, by the officers of the 2nd battalion Queen's Royal West Surrey Regiment, in which corps Sir George served for many years. The window comprises five lights and tracery. The design selected contains a representation of our Saviour in the centre light, and the four Evangelists in the side lights. These figures are each surmounted by a canopy of ornamental design, and beneath each of the last four figures is introduced the appropriate emblem of the saint. In the base of the centre light is represented the badge of the regiment, of which the late general was formerly an officer. The tracery is filled with a design containing angels bearing scrolls, and several sacred monograms. Messrs. A. L. Moore & Co., of 89, Southampton-row, London, have designed and executed the entire work. Sir George Pomeroy Colley joined the Queen's as an ensign, and he never served in any other regiment. At the foot of the window the following inscription is written:—"This window is placed, in memory of Major-General Sir George Pomeroy Colley, C.B., C.M.G., K.C.S.I., by his brother officers of the Second Queen's Royals. He fell in action when commanding the troops in South Africa, on 27th February, 1881."

#### WALL DECORATIONS AT HUGHENDEN CHURCH.

MEMORIAL OF THE LATE EARL OF BEACONSFIELD.

The mural paintings in the sanctuary of Hughenden Church, which have been completed as part of the memorial to Lord Beaconsfield, were solemnly dedicated on Christmas-day. Starting from the floor of the sanctuary to the string-course, about 4 ft. in height of the wall (says a Buckinghamshire paper), is painted a very rich vine pattern in two shades of Venetian red, with clusters of grapes in gold. The altar is marked out with a band of gold, and on either side is a design of wheat. It is surmounted by a wreath of Passion-flowers, painted in red on a gold ground. The panels over the altar-ledge are painted on Sequoia-wood, the centre containing a lily and frankincense, the side panels having roses, on gold quatrefoils; the stone mouldings are picked out in gold designs of grapes, flowers, &c. Within the spay of the east window an elegant branch of frankincense is painted in Venetian red, the stonework being gilded and painted with olive branches and birds. Above the string-course on either side of the altar are vesica-shaped medallions, containing half-length representations of the four greater Prophets, each holding in his hand the symbol of his office and character. Above these, divided by a band of pomegranates in gold and vellum, are full-length figures of the four Evangelists, each surmounted by a canopy. They are painted on a gold groundwork. Above the canopies are quatrefoils in red, with representations of cherubim. Just above these is a cloud-line with stars, from which springs a bold vine pattern in gold, broken by five medallions, containing figures of angels bearing censers representing the nine orders of the angels. Each figure bends downwards, gazing upon the central figure of our Lord in glory, in the east window. A rich band of crimson follows round the moulding of the window, on which are pomegranates in gold, the band being broken by seven medallions, each containing a dove, as an emblem of the seven Gifts of the Spirit. The groundwork of the roof over the sacristy is gilded; the side-walls, as far as the altar-rails, are powdered with marguerites in red; while over the arches, north and south, are bands bearing a design of figs and leaves. In front of the credence is a design of a cross with rays, bordered with wheat. The whole design and execution of the work, which is highly spoken of by those who have seen it, has been carried out by Messrs. Heaton, Butler, & Bayne.

#### CHRIST CHURCH, ST. GEORGE'S-IN-THE-EAST.

The new schools, choir vestry, &c., have recently been opened by the Bishop of Bedford, having been erected from funds received in connexion with the Middlesex Schools and Raime's Charity.

They are built on a portion of the vicar's garden, adjoining the church, having entrances from the garden, the chancel of the church, and Dean-street. The style is in keeping with the architecture of the church. The works have been executed by Messrs. Mowl & Son, from the designs and under the superintendence of Mr. C. E. Peters, architect.

#### A BIRMINGHAM RESTAURANT.

The new Central Restaurant, in Corporation-street, Birmingham, has just been opened. The floor of the new "Central Arcade," which opens out of Corporation-street just above New-street, forms the roof of the Central Restaurant. The glass flooring of the Arcade is not, however, the actual ceiling of the restaurant. Beneath it is a second tessellated glass structure, formed of red, white, and blue glass, worked into ornamental designs, through which the light falls coloured upon the bar. The restaurant extends the whole length of the Arcade. The dining-saloon and bar form one room, 130 ft. long by 30 ft. wide. Along 50 ft. of it runs the counter, a very handsome piece of woodwork, fitted in front with twenty-six mirror-panels, each presenting a different design,—the centre one being the Birmingham coat of arms. From end to end of the restaurant the walls are formed of gigantic square mirrors. Down the middle of the saloon runs a row of square pillars, the sides of which are also covered with mirrors, whilst other mirrors are placed in front of the counter, and, in fact, in every place where it is possible for a plate of silvered glass to be inserted. Altogether there are 2,500 square feet of mirror. The effect of the 120 mirrors is considerably enhanced by the walnut mouldings employed to encase them, and by the cornice above, hand-painted with floral and other decorations. A lounge extends the whole length of the saloon, at one end of which, shut off by screens of coloured glass, is placed the grill for chops and steaks, the cooking of which is entirely carried on by vegetable charcoal. At the grill end of the saloon there is a well-fitted lavatory, whilst at the opposite end is an oyster-room. The cellar-space is of an extent equal to the whole length of the restaurant, and of easy access in consequence of its position immediately below. Messrs. P. Whitfield & Co. fitted up the cellar. The architect of the restaurant was Mr. W. H. Ward, and Messrs. J. & O. C. Hawkes did the chief decorative work. Messrs. Messenger & Son supplied the gasfittings, and Mr. S. Mason the bar-fittings.

#### BUILDING PATENTS.\*

APPLICATIONS FOR LETTERS PATENT.

- 5,506. S. A. Say, London. Adjusting doors. Dec. 16, 1881.
- 5,515. J. D. Taylor, Halifax. Traps for preventing the passage of gases from sewers and drains. (Com. by W. D. Taylor, Philadelphia, U.S.A.) Dec. 16, 1881.
- 5,526. T. Fletcher, Warrington. Plastic composition for fire-resisting purposes. Dec. 17, 1881.
- 5,543. C. F. Soblickeyen, Berlin. Brick-moulding machines. (Com. Spec.) Dec. 17, 1881.
- 5,554. B. C. Cross, Dewsbury. Apparatus for fastening, releasing, &c., window-sashes. Dec. 19, 1881.
- 5,571. A. M. Clark, London. Floor coverings. (Com. by C. T. Meyer and V. E. Meyer, Jersey City, U.S.A.) Dec. 20, 1881.
- 5,576. H. S. Creglen, Bromley. Ventilation of soil-pipes, &c. Dec. 20, 1881.
- 5,590. H. H. Lake, London. Door checks, &c. (Com. by L. C. Norton, Boston, U.S.A.) (Comp. Spec.) Dec. 21, 1881.
- 5,603. O. Trossin, London. Fireplaces for the consumption of smoke. Dec. 22, 1881.
- 5,577. J. Barrett, Eastburn. Method of opening and closing doors in connexion with hoists. Dec. 27, 1881.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

- 5,679. J. Gillingham, Chard. Fireplaces and stoves. Dec. 27, 1881.
- 5,694. J. Schofield, Littleborough. Grates and furnaces. Dec. 28, 1881.
- 5,703. F. Brown, London. Cooking-stoves and fireplaces, &c. Dec. 28, 1881.

#### NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

- December 20, 1881.
- 3,606. C. D. Abel, London. Metallic structures suitable for barnack and other buildings. (Com. by La Société Nouvelle de Constructions, Paris.) Aug. 19, 1881.
- 3,648. W. H. Stephenson, Blackburn. Heating apparatus. Aug. 23, 1881.
- 3,693. H. C. Yae P. Ahrebecker and H. E. J. Hamkens, Lambeth. Fluid meters. Aug. 24, 1881.
- 3,738. E. Haskell and J. P. Bayley, London. Heating by gas. Aug. 27, 1881.
- 4,042. S. Clark, Islington. Gas and oil stoves for heating, &c. Sept. 19, 1881.
- 4,101. C. J. C. M. Baron de Liebhafner, Avallon. Cleansing, polishing, &c., articles of marble, stone, &c. Sept. 23, 1881.
- 4,335. W. R. Kinipple, Westminster. Construction of harbours, breakwaters, docks, &c. Oct. 5, 1881.
- 4,707. J. H. Miles, Southampton. Arrangement and construction of window-sashes, &c. Oct. 27, 1881.
- 4,953. H. W. Gates, Brighton. Ventilator for chimneys, &c. Nov. 12, 1881.
- December 23, 1881.
- 4,050. A. Martin, Woolwich. Springs for doors, &c. Sept. 20, 1881.
- 4,787. J. Danaachie, Glenboig. Stoves, &c. Nov. 2, 1881.
- 4,840. J. B. Spence, London, and E. Ormerod, Belvedere. Manufacture of cement for receiving an enamelled surface. Nov. 4, 1881.

#### ABSTRACTS OF SPECIFICATIONS

Published during the Week ending December 24, 1881.

- 2,128. C. D. Abel, London. Compound for renovating and preserving the polish of wood furniture. This compound is made of linseed oil, olive oil, gum mastic, sulphuric ether, solution of gum byres in alcohol, spirits of turpentine, extract of curcuma root prepared with alcohol and nitrobenzole. (Com. by E. Scänitz, Berlin.) (Pro. Pro.) May 16, 1881. Price 2d.
- 2,135. R. H. Abrey, Highbury. Heating apparatus. The boiler is placed in the house, &c., to be heated, and the products of combustion are led away by pipes also within the house. These are surrounded by an exterior pipe, through which the water from the boiler travels. (Pro. Pro.) May 17, 1881. Price 2d.
- 2,140. E. Hutton, Manchester. Ventilating apparatus. This is a hopper ventilator, which has strips of flexible material along its upper edge and sides, so that when closed it may be rather tight. The hinge is the full width of the bottom. (Pro. Pro.) May 17, 1881. Price 2d.
- 2,147. W. Bartholomew, Lambeth. Water-waste preventer. The cistern holds a certain required quantity of water. A bell is arranged within the cistern, inside which is the delivery-pipe, whose mouth is above the level of the water when the cistern is full; the bottom of the bell is nearly closed round this delivery-pipe, and on the bell being lifted, it raises the water inside it and establishes a siphon-like action, setting up a flow in the pipe. May 17, 1881. Price 6d.
- 2,149. T. F. Shillington, Belfast. Fireplaces, &c. The back does not extend quite to the bottom of the grate, and a fuel-chamber is constructed at the rear, from which fuel passes to the fireplace through this aperture in the back. At this point there is a downwardly curved flange, to keep the smoke down until it is burnt. This flange is hollow and perforated, to admit air to assist the combustion. May 17, 1881. Price 6d.
- 2,153. J. Sawyer, London. Register-stoves, &c. A combustion-chamber is fixed at the back of the stove, in which the smoke from the fire is consumed before it is taken to the chimney. (Pro. Pro.) May 17, 1881. Price 2d.
- 2,160. E. S. Harvey, Tottenham, and J. Brodie, London. Attaching knobs to door-lock and other spindles. The knob has a square hole, corresponding to the spindle. Notches are cut across the faces of the spindle, on which a strip of thin steel is laid, one end being bent, to take one of the notches. Tongues are cut out of the centre of the strip, and bent outwards. When the knob is passed over the spindle the tongue springs out into a slot in the bush, thereby preventing the knob from being drawn back. May 18, 1881. Price 6d.
- 2,174. J. Walker, Leeds. Manufacture of bricks, tiles, &c. These vitrified bricks, &c., are composed of brick earth



or clay and waste oxide of iron, to which is added manganese. The whole is pulverised together, and to prevent fusion together of the articles during the burning, they are valued in separately by a layer of old spent tan or ground bark. May 19, 1881. Price 4d.

2,222. A. McMillan, Thornliebank. Applying springs to doors.

The doors being hung on double-acting hinges, a helical spring is placed in a recess in the top edge of the door, the outer end of which is fixed to the door, while to the other end is attached a wire cord passing between two rollers at the back end of the recess with the end fixed to the door-frame. May 21, 1881. Price 6d.

2,229. S. H. Ogden, Manchester. Fire-grate screens.

This is an improvement on Patent No. 4,324, of 1877, in using a spring clip-hook which fastens on the heading on the grate-front from which the screen is suspended. May 21, 1881. Price 6d.

2,249. O. L. Friedländer, Jönköping, Sweden. Apparatus for heating dwelling-houses, hospitals, &c.

The stove has an air-chamber in which is a furnace terminating in a tube box, from which the products of combustion are led through tubes to a second tube-box, thence through other tubes, and finally to the chimney. The cold air is admitted at the bottom of the air-chamber, in which it is heated by contact with the furnace and the tubes. May 24, 1881. Price 6d.

2,276. J. McI. Shaw, Glasgow. Kitchen ranges.

Two vertical flaps are hinged so that when opened out they form an expanding flap opening above the fire. A sliding grating moves above a fixed grating to pass the fire gases through an oven flue to the chimney, or when closed, to direct these gases through another flue. A flue is also led under and behind the boiler, also fitted with a shield to close the same. May 24, 1881. Price 6d.

#### LEAD POISONING.

SIR,—It is with great interest I read in your paper of the 24th ult. (p. 804) the letter on "Lead Poisoning," which certainly took me very much by surprise, as it seemed rather the opposite to what I have hitherto understood and experienced. In the first place, the writer says,—"Water containing lime, magnesia, or earthy carbonates, never can or will act on metallic bodies." Now, sir, the water supplied by our waterworks here (Tunbridge Wells) is supposed to be full of lime and iron; the iron there is no doubt at all about, as it is to be seen in every half-pint of water, to say nothing about the sediment on cistern-bottoms and the rust-corrosion inside of pipes in a very short time. But the more important part of the subject is, that the water will eat a leaden cistern-bottom full of holes in a comparatively short time. I have known it occur in less than two years, as I have had many to repair. In fact, no man with any conscience at all can recommend the use of a leaden cistern in this town. Can it be said there is no lime in this water?

In the second place, the writer goes on to say there is no fear of lead poisoning by the water we obtain from the water companies; but that seems to me quite contrary to my experience. I should like to know what becomes of all the lead eaten away by our company's water when it is stirred up, as it is every time the water comes in.

In the last paragraph the writer says that "as in some parts of the country water is scarce, and the rain-water is stored in leaden-lined tanks, then a certain action on may be relied on, and the water contained is sure to indicate, by the test of sulphuretted hydrogen, lead in sufficient quantities to induce slow poisoning." Now, sir, does he here infer that the rain-water will so act on, or dissolve, the leaden cistern as to render the water poisonous? Because, sir, this again seems quite the reverse of my experience, as, after twenty-five years acting as a practical plumber, I do not remember a single instance of a leaden cistern being eaten away by rain-water. In fact, we often turn the rain-water in with the company's water (when it is not used for drinking) to neutralise the action of the water and to save the cistern. W. EASTWOOD.

**The late Lord Laurerton.**—An elaborately-carved Portland stone monument has been erected in Slingsby Churchyard to the memory of the late Lord Laurerton, of Castle Howard, by his sisters, Lady Elizabeth Grey and Lady Taunton. The monument was designed by Mr. C. Hodgson Fowler, F.S.A., of Durham, and executed by Mr. Roddis, Aston, Birmingham. The form of the monument is that of the old Irish cross foliated, representing the vine with clusters of fruit; in the centre, a representation of Christ holding the world in his right hand, with two angelic figures offering up incense from their censers. The monument is 10ft. high.

#### ON A PROPER AND FULL USE OF THE HYPHEN IN COMPOUND WORDS IN ENGINEERING REPORTS.

I do not know that there is any strict rule to be followed in using the hyphen to compound words, or when such words may be written as one word. As, for instance, railway is now commonly written "railway"; cess-pool, and sub-soil are written with the hyphen, but they may be written as one word, without the hyphen, just as railway is written. Then we have rainfall, rain-storm, water-drains, storm-water-drain, water-carriage, drain-pipe, and other similar words sometimes hyphenated, oftener not, in the same report; there is not uniformity of treatment, as the hyphen is used and left out apparently at random, evidently showing absence of thought and care in the writer. The mischief is, however, worse when house-fittings are described in reports and in specifications. As, for instance, service-box, stool-cook, bib-cook, water-closet, flush-tank, house-drain, sink-stone, gully-grate, and many others are written without the hyphen, which should be written with the hyphen. These few remarks may serve to draw attention to the subject, and may also probably induce some young engineers to strive after uniformity, and, if they use the hyphen to a compound word in one place, they should be consistent and follow it throughout. R. RAWLINSON, C.B.

#### POINTING MORTAR AND SILICATE OF SODA.

SIR,—I am desirous of making up the best possible fine pointing-mortar, for stopping-in raked joints of new brickwork, to be struck and cut in imitation of the natural joint, as it would be made were it finished when the bricks were laid. I propose using washed sharp sand and Dorking lime. Would any of your readers kindly inform me whether the mortar would be improved by gauging it with silicate of soda? There is little doubt as to the silica; but, how about the soda? L.

#### PROVINCIAL NEWS.

**Radcliffe.**—The Conservative Club, lately opened, is a simple and unpretentious building, of Gothic character, faced externally with red brick, relieved with bands of blue brick. The object has been to provide ample and well-arranged accommodation, and all essentials of a club building, with the minimum expenditure. The building is, therefore, necessarily devoid of architectural ornamentation, attention having been mainly given to plan and internal arrangement. The ground-floor is provided a reading-room, 43 ft. 3 in. by 27 ft., to be used also for political or other meetings, also a committee-room, card-room, lavatories, &c. On the first floor is a lofty billiard-room, the same size as the reading-room below, and accommodating two tables; also a smaller billiard-room, with one table; between them, and accessible from both, is the refreshment-bar. These rooms are open to the roof, and, in addition to the side windows, are provided with good top light. A smoke-room, 15 ft. by 13 ft., is also provided on this floor, and on the mezzanine is a bath-room and additional lavatories, &c. In the basement are cellars for wine, beer, coals, and heating apparatus. Attached to the club is the caretaker's residence, consisting of living-room, scullery, bed-room, wash-cellar, &c. The total cost of the building, exclusive of furnishing, has been 1,750l. The contractor for the entire work was Mr. John Allen, of Radcliffe. The work has been carried out from the designs, and under the supervision of the architect, Mr. William Dawes, of Manchester.

**Cramlington.**—The members of the Cramlington (Northumberland) Co-operative Society have determined upon the erection of large premises, with offices attached, in a central position at Cramlington. The new buildings, which will be about 250 ft. long, will be fitted up in a very complete manner, and heated throughout with hot water. There will be departments for draperies, groceries, hardware, millinery, boots, &c.; tailors' and milliners' work-rooms, flour warehouse, butcher's shop, coffee-roasting and general grinding and mixing rooms. A large meeting or lecture hall is arranged for on the first floor, with ante-room attached, and offices and committee-room, with fireproof rooms opening out of each. Steam-power will be employed for all grinding and mixing operations. To the rear of the main buildings will be a large block of stabling, harness-room, lofts, and sheds for

wagons. Mr. Fortune, of North Sunderland, is the contractor, and the works have been designed and are being carried out under the superintendence of Mr. J. J. Lish, architect, of Newcastle-upon-Tyne.

**Milnthorpe.**—Kitching's Memorial Hospital and Reading-rooms at Milnthorpe, Westmoreland, have been opened. It will be remembered that the hospital has been built by Mrs. Bindloss, wife of the Mayor of Kendal, and will be kept up by that lady at her sole expense, as a memorial to her late father, John Kitching, M.R.C.S., who was a native of Milnthorpe, and practised in South Andley-street, Grosvenor-square, London, for upwards of thirty years. The hospital will accommodate about twenty patients, and has been erected in a beautiful situation overlooking Morecambe Bay. The reading-rooms, for the use of the inhabitants of Milnthorpe, built by the late Mrs. Thompson Bindloss, of Castle Green, near Kendal, have also been erected as a memorial to the late Dr. Kitching, by his sister. The Institute comprises reading-room, coffee-room, library, and a large lecture-room; over these are billiard and bagatelle rooms. Both the buildings were designed and carried out under the personal supervision of Mr. Eli Cox, architect, Kendal.

**Guildford.**—The sanitary condition of Guildford is very far from being all that could be desired, and it is therefore satisfactory to note that the Urban Sanitary Authority have appointed a select committee to consider and report as to the appointment of an engineer to carry out a proper system of sewerage. Notwithstanding that the New Bridge and railway approach need not be completed under two years, as a matter of fact the engineer, Mr. C. H. Sparkes, and the contractors under him, have made considerable progress with both, although only about four months have elapsed since the work was commenced. The road, both from the Woodbridge-road and North-street ends, has been laid out the whole length to the river side, and solid timber fencing erected along the sides where necessary, this latter work having been carried out by Messrs. Marshall, timber merchants, Godalming. At the entrance by the Old Barracks a house at the corner has been already demolished preparatory to setting back the road to the necessary width. At present the foundation or bottom of the road is nearing completion, but the road itself has to be raised in order to reduce the gradient of the approach to the bridge. The abutments are practically complete, and await the girders and ironwork. The masonry and brickwork have a solid appearance, Bath stone and white Staffordshire facing bricks, with Portland stones for the bedstones, being the materials used. The bridge will have a span of 70 ft. At a recent meeting of the Urban Sanitary Authority it was decided to adopt a more ornamental design for the superstructure of the bridge than that previously determined upon. The extra cost will be 200l. A notable feature of the undertaking is the large extent of frontage opened up, and the quantity of land thus rendered available for building and commercial purposes almost in the heart of the borough, which must otherwise have remained shut in. Besides the roads actually connecting the bridge with the main thoroughfares and the railway station, a road has been laid out and sweeps by the end of the cricket ground, terminating at the north side, thus at present forming a *cul de sac*, but altering and improving considerably the appearance of the land at this point.

#### STAINED GLASS.

**Birchfield, near Birmingham.**—The west window of Holy Trinity Church has just been filled with stained glass as a memorial to the late Mr. Thomas Bullock, by his family. The subject is our Lord in Glory, similar to that occupying the west window of St. Martin's Church, Birmingham.

**Jersey.**—A stained-glass window has lately been erected at St. Mark's Church, Jersey. The window is an eight-light one, and has been executed by Messrs. Gibbs & Howard, of London. The lights contain foliated ornamental canopies and bases on alternate ruby and grey grounds, and contain each a subject illustrating a scene from the life of our Lord, and finally depicting His glory as King and Priest, surrounded by adoring angels holding palms. The tracery contains worshipping angels amid foliated ornament.



## CHURCH-BUILDING NEWS.

**Galashiels.**—A new church for the parish of Galashiels has been opened. The population of the town has nearly doubled itself within the last fifteen years. A new congregation,—the West Church,—has been formed within that period, and although it for a time relieved the pressure on the parish church, of late years the pressure has been steadily growing. The new church was begun in 1878, from designs by Mr. Hay, architect, Edinburgh. A site was found near the old church. The estimated cost, including the spire, but exclusive of organ and pulpit, was about 18,000*l.* Of that sum probably about 10,000*l.* have been subscribed, and in the meantime it has been resolved to delay the building of the spire until a debt of something over 2,000*l.* is cleared off. The style is Early Decorated. The front elevation is at the north end, facing to Scott-street. The masonry outside and inside is of finely-hewn stone,—the outside of rich red sandstone, and the inside of coloured grey sandstone, intermixed with red stone mouldings and other details. The spire, with the tower, is to be 190 ft. high; but the tower is only built as yet. A spacious hall is built at the south end, for the use of smaller meetings. Inside, the church is divided into nave, aisles, and transepts. The length of the nave is 83 ft.; width across nave and aisles, 53 ft.; width across transepts, 32 ft.; breadth of transepts, 40 ft.; height from floor to wall-plate of nave, 36 ft.; height to apex of roof, 62 ft. The roofs are of open-timber work, supported on corbelled shafts of red freestone, with capitals and corbels carved against clerestory walls. The church is divided into six bays in length. The nave is supported on pillars of polished Peterhead granite, with carved freestone capitals and moulded bases. The transepts have tripartite roofs and triple gables, supported internally by two rows of polished granite pillars and arches. The seats are of pitch-pine, with open ends. The pulpit and choir seats are of oak, and placed on a raised platform. The pulpit is square in plan, with low desk and carved paneled framing. The great north-end window over the main entrance is one of the most striking features of the church, and has an historical interest for Galashiels. It is the Douglas memorial window, in memory of Dr. Douglas, for many years minister of Galashiels, when the town was little more than a village, and the trade in its infancy, and which he did so much to foster in its early struggles. He was also a contemporary and friend and neighbour of Sir Walter Scott. The window is a gift of Miss Douglas, daughter of Dr. Douglas. The church is seated for 950 persons. The grand organ is placed at the back of the pulpit, and fills up the large archway between the church and hall. It is by Willis & Son, London, and cost 1,150*l.*, independent of casing and framework.

**Norton.**—The work of restoring Norton Church, Derbyshire, has (according to the *Sheffield Independent*) revealed some long-concealed features. Traces of mural painting are here and there to be noted in places where the plaster has been removed. In putting in the galleries some seventy years ago, barbarous work was made with the capitals of the columns forming the arcade of the nave, and the face of a heating stove has been cut right through the moulding of the tower arch. Near the pulpit, on the site of what is supposed to have been the vault of the Selokes of Haselbarrow, have been found two incised slabs, bearing figures, and surrounded by inscriptions. Both the figures and the lettering are much worn and broken, but little doubt is entertained that the stones are memorials of members of the Seloke family. The glory of Norton Church, however, is the Blythe Chapel and the monument to William Blythe and his wife, erected by their son, Geoffrey Blythe, bishop of Lichfield and Coventry, about 1524. It is a beautiful work in alabaster, in style and execution resembling the monument of George, the fourth Earl of Shrewsbury, and his two wives, in Sheffield parish church. The Blythe monument has suffered shameful mutilation, but it still bears the arms of Lichfield impaling Blythe, and on another shield three cinquefoils between nine cross croselets fitchy, for Anstin, the family of the bishop's mother. Mainly through the exertions of the families at Norton Hall and the Oaks, the present restoration of the church is being carried on. The work has proceeded in a conservative spirit, under the direction of the

late Mr. Street, R.A. The relics of the past that have been found will be carefully preserved. The Bagshawe vault has been carefully covered with concrete and finally closed, and it is probable that the Shore vault will be similarly treated, and the unsightly mass of masonry that now covers it, and hides one side of the Blythe monument, removed. It may be noted here that Chantrey, the sculptor, was born at Norton, and commenced his career as a milk-boy. He used to convey milk, on donkey-back, daily to the neighbouring town of Sheffield.

## DISSENTING CHURCH-BUILDING NEWS.

**Ryton-on-Tyne.**—The Wesleyan Methodists have just completed a new chapel, lecture-hall, and schools abutting upon the Hexham-road, which are intended to serve as the headquarters of the newly-formed Ryton Circuit, at a cost of upwards of 4,000*l.* The chapel, which is Early English in design, will seat in all about 700 persons, and is planned with a nave, aisles, and transepts. In the north-west corner is a clock-tower with slated roof, and behind the main buildings is a chapel-keeper's house. The works have been carried out from the designs and under the superintendence of Mr. J. J. Lish, architect, of Newcastle-upon-Tyne. Messrs. Dinning & Cooke, Newcastle, were the contractors for the hot-water heating; the Leeds and Bradford Glass Company executed the glazing; Mr. Wm. Lishman, Ryton, the masons' and plasterers' work; Messrs. R. B. Charlton & Co., the plumbers' and fenders' work; Mr. J. J. Salter, the joiner's work; Mr. Rutter, the painter's work; and Messrs. C. & G. Nicholson, the slater's work.

**Cramlington.**—Commencement has been made with the erection of church and school premises at Cramlington, Northumberland, for the Wesleyan Methodists, to accommodate about 500 persons. The works are being carried out from the designs and under the superintendence of Mr. J. J. Lish, architect, Newcastle-upon-Tyne.

**Heaton.**—The Presbyterians of Heaton have opened a new lecture-hall, school, and vestries, on a site facing to Tynemouth-road, and a spacious church is to be erected on the remainder of the ground. Messrs. Harrison & Horn have been entrusted with the works so far contracted for, the architect being Mr. J. J. Lish, Newcastle-upon-Tyne.

**Low Fell, Gateshead.**—Several memorial-stones of a new Wesleyan chapel, which is about to be built at Low Fell, Gateshead, have been laid. The new buildings will face the main road, and will be in the Gothic style, and built of stone. The chapel, as at present planned, will seat about 500 worshippers; but there is space left in the rear on which it can be extended to accommodate about 300 more. Internally the edifice will have a nave and two side aisles, the latter being divided from the nave by means of ornamental columns carrying an arcading. Galleries will run round three sides of the building, and they will be approached by two main staircases. At the back of the nave there will be an organ-chamber and a choir gallery. Schools will be built to the south of the chapel, the cost of the works being estimated at about 4,000*l.* Messrs. Gresson & Stockdale are the contractors, and Mr. J. J. Lish, Newcastle-upon-Tyne, is the architect.

**Anerley.**—The "New Jerusalem" Church here, now in progress, is Gothic in design, having a nave, 80 ft. by 38 ft., chancel, and vestry on each side. The roof is open-timbered, the principal rafters on clustered columns, which rise from the floor. The building is entered by steps between a pair of octagon towers, with spires and square bases, designed for bellries and staircases leading from the spacious school-room, vestry, and tea-room, occupying the basement of the structure. The walls of the church and vestries, with arches, columns, mouldings, mullions, sills, steps, and landings, will be built entirely in Portland cement concrete, the ballast for which was burned upon the site, the Portland cement being supplied by Messrs. Bazley White & Bros. The building has been designed and is being carried out by Mr. W. J. E. Henley, manager of the Concrete Building Company, Blackfriars-road, and will cost about 3,000*l.* when completed.

**Obituary.**—On the 27th of December, at 23, Beaufort-street, Chelsea, died Francis Chester, architect, and late of the Theatre Royal, Manchester, aged 70.

## Books.

*The Water Supply of England and Wales: its Geology, Underground Circulation, Surface Distribution, and Statistics.* By CHARLES E. DE RANCE, C.E., &c. London: Stanford, 1882.

MR. DE RANCE'S volume, of which the aim is fairly indicated on the title, may be described as essentially an abstract of the information collected by the officers of the Ordnance Survey with reference to the geological features affecting the water supply of England. It is, however, by no means confined to this source of inquiry, as between 200 and 300 writers on this subject are not only cited, but referred to in a separate index. Indeed, the first merit of the book may be said to be the candour with which it indicates the sources of the information which it presents in a digested form. The various urban sanitary authorities are also named according to their localities; the statistics of their several areas being taken from a return made by the Local Government Board in 1879. The census figures for population are taken from the preliminary report of the census for 1881, which was published in July.

A kind of sketch or programme of the work was submitted by the author to the Congress on National Water Supply which met in 1878. In this paper was a useful table, which it is a pity that the present volume does not reproduce in a more complete form. It is a cross division of the river basins and the geological formations, with the addition of a note on the rainfall of the basins, taken from Mr. Symonds' map. A map of catchment-basins is given in the present volume, but the value of this book would have been increased by the addition of tables, or other forms of explanation, of this as well as of the other five excellent maps which it contains.

The portion of the book which most needs some justification is its total silence with respect to the work called "Water and Water Supply," published only three years ago by the late Professor Ansted, which is laid down so much on the same lines. Mr. de Rance's book contains, it is true, the geological information in which the former work is defective; the intention of the author having been to supply it in a second volume. Thus the possession of the earlier work by no means affords a reason against the purchase of the second, as the information as to what is rather unhappily called the hydro-geological map,—that is to say, the division of the country according to the permeability of its soil,—is indispensable to the student of water supply. But the two first chapters of each work treat of exactly the same subjects, viz., the composition of water, and rainfall, evaporation, and percolation. And as to the topographical part of the books, which covers the same ground as far as the present volume goes, Mr. Ansted's description is more luminous. There is thus some waste of power involved in the ignoring of the uncompleted work of a fellow-labourer of such recent date.

Those of our readers who can remember our early and often-repeated demand for a hydro-geological survey of England will not be surprised to hear that this new work on the water supply of England and Wales is silent as to the primary feature of the river flow of the country. We do not impute this to any want of diligence in the author. The facts are unobscured. When this statement is contrasted with the full and detailed information which is accessible as to the river volumes of France and Italy, it becomes obvious how far we are as yet from having ascertained even the primary rudiments of the information requisite for the proper treatment of the water supply of any given locality. Thanks to the untiring labours of Mr. Symonds and his associates of the Meteorological Society, the rainfall of England is approximately known. A reproduction of Mr. Symonds' map of rainfall in the Sixth Report of the River Commission, is given on the first page of "The Water Supply of England and Wales," and gives a good synoptical idea of the distribution of rain. The general division of the kingdom into impermeable, partially porous, super-pervious, and permeable strata is given in the second map. It is a simple natural division. But if we compare this map with one on precisely the same scale in Woodward's "Geology of England and Wales," which indicates by different colours fifteen geological systems, we find that a much clearer idea is given by the latter, even of the mere fact of permeability, than by the former. At any rate, it would



have been better to delineate the boundaries of the catchment-basins, which are given on the third map, on the geological chart. These are minor points, but not unimportant. What is necessary for the engineer is to be able to trace the flow of the water supply of England from the clouds to the sea. Rainfall is thus the first point of study; percolation or evaporation is second. But the cycle of information is sadly incomplete until we are in possession of the third element, that of outflow, which not only is requisite as a check on the preceding estimates, but is the portion of the inquiry in which the water-supply engineer comes directly in contact with the meteorologist and the geologist. As we have before pointed out, legislation on the subject of water-supply, drainage, prevention of floods, and sanitation of urban and rural districts, is all in the air until we have such a knowledge of the physical condition of our rivers as other nations have found it necessary to acquire of their own.

A map which we could not have expected to find in this volume, but which we are glad to see there, as indirectly connected with the question of water-supply, is one showing the growth of London. It indicates by different colours the boundaries of the buildings of the metropolis in 1560, 1745, 1813, 1834, 1867, and 1881 respectively. This subject will not be new to our readers, to whom the chief value of this map will be the late date to which it is brought down. We should like, however, to know on what authority the last colour is distributed. The most interesting feature in this map is the illustration of the mode of the growth of the metropolis during the last forty-seven years. From 1834 to 1867 the area covered by new buildings partly rounded off the central mass, filling up the space to the North London, the West London, and the South London lines of railway; and partly shot out in long rays or feelers along the main converging roads, especially towards Tooting, Streatham, Bromley, and Gipsy Hill, on the south, and towards Stamford Hill, Crouch End, Highgate, and Hampstead, on the north. From 1867 to 1881 the area newly covered has been, for the most part, within the limits thus attained in the former year; the chief advance beyond them having been in the direction of Putney Heath and South Norwood. Subject to the verification for which the sources should have been clearly indicated, this map possesses great interest for the builder. It is followed by a plan showing the division of the water-supply of London in the Superintendent Registrar's districts and sub-districts. The division is clear, as far as it goes; but the map fails to indicate the boundary of the district over which the metropolitan water companies have Parliamentary powers. This area, which is no less than 533 square miles, or nearly five times the area over which the Metropolitan Board of Works has jurisdiction, is shown on a map contained in a pamphlet on "The London Water Supply," published by Messrs. Sporn in 1878, which was said to have contributed in no small degree to the defeat of the two Bills then promoted by the Metropolitan Board of Works. Any map of the districts of the water companies that does not show their full extent is calculated to mislead the student of a subject on which there can be little doubt that the war-cry will again be raised so soon as there is any chance of obtaining an interval for the Parliamentary discussion of any new proposals.

For the main defect of the book, the absence of any volumetric information as to the discharge of the various catchment-basins, the author is not responsible. His work, indeed, may be of service in calling more general attention to this lack of essential information. As illustrating the close connexion between geology and meteorology, the volume has most originality and value. And the indication of the position of some thousand or more unconnected and undirected local sanitary authorities may tend to raise wholesome reflections as to the thoroughly unscientific way in which the great question of national water-supply has been hitherto approached, either by the profession, by the administration, or by Parliament. The recommendation of the Water Supply Congress, although forwarded by H. R. H. the Prince of Wales to the Prime Minister, has hitherto remained without effect.

**Ipswich.**—Messrs. E. R. & F. Turner are making considerable additions to their tannery and tools department, and increasing their appliances.

### Miscellaneous.

**Presentation to a Borough Engineer.**—Mr. A. M. Fowler, the late Borough Engineer of Newcastle-on-Tyne, has had presented to him a testimonial signed by a number of the aldermen and town councillors, bearing witness to his great professional ability and the admirable manner in which he has performed the duties of his position. The address presented to him expresses the desire of those who signed it to give utterance to their "appreciation of his character, his ability, and the services which he has rendered to this borough during the time he has held the position of Chief Engineer and Town Surveyor," and goes on to say:—

"Mr. Fowler came here a stranger four years ago from Salford, where he held a similar position for five years, and he brought with him such testimonials from Leeds, Rochdale, Manchester, and Salford as led to his being selected out of fifty candidates for the appointment, at a salary of 1,000*l.* a year. Unfortunately, Mr. Fowler, whilst charged with the command of the whole of the staff, was placed in the embarrassing position of being elected above the Town Surveyor, who had previously been invested with full powers, and the result has been want of harmony and co-operation among the officials, with a divided responsibility and mutual misunderstandings, which were not conducive to the best interests of the borough. This led to investigations by a committee the opinions of whose members were considerably divided as to the end of the incidence of blame should fall. In the end the Council decided that it would be better to make an entire change in the staff, without preferring any charge or assigning any reason for so doing, and it is thus that Mr. Fowler vacates his appointment."

**The Pollution of the Lower Thames.**—The annual report of the Plumstead District Board of Works has just been issued. It consists of a volume of 200 pages, and gives particulars of a scheme, estimated to cost 20,000*l.*, for the drainage of New Eltham, a parish within the metropolitan area, into the sewer just constructed by the West Kent Sewerage Board. It is also proposed to drain a large number of houses at South Lee (likewise within the metropolis) into the West Kent sewer. This will be the first instance of any portion of the metropolis being drained into a sewer which is not under the control of the Metropolitan Board of Works, and a correspondence is being carried on between the latter Board and the District Board with a view of obviating the ratepayers of New Eltham and South Lee having to pay claims from the two Sewer Boards, each having power to levy a sewer rate. This diversion of sewage will tend to relieve the over-charged southern outfall sewer at Crossness. The New West Kent drainage area is a very large one, including Bromley, Beckenham, the Crays, and a considerable portion of West Kent; and when the scheme is complete, it will bring a large accession of sewage into the already over-polluted Thames, the West Kent sewer outfall being off Dartford.

**An Unusual Accident** occurred at No. 8, Hanover-square, on Monday last. The tenant complained to her builder, Mr. W. Cole, that when the water from the street main came into the cistern, there was a great escape of gas. The builder's men having tested and examined the gas-pipes in the house, and found all correct, Mr. Cole personally attended, and also found the gas appliances perfect, and while in the act of looking in the cistern, the water was turned on from the road, and the first rush of air brought an immense quantity of gas, which filled the tank, and before Mr. Cole could escape an explosion took place, which blew him away, and seriously burnt him. This is a serious matter, and should be inquired into.

**Proposed Tunnel under the Straits of Messina.**—It is stated that the Italian Minister of Public Works has authorised a company of railway contractors to construct a submarine tunnel between Sicily and Calabria, under the Straits of Messina. Several prominent engineers are at present at Messina engaged in drawing up the plans. It is proposed that a railway shall run through the tunnel, in communication with the Eboli-Reggio line on the Italian peninsula.

**The Courts of Justice.**—We have already mentioned that the two gentlemen who have been Mr. Street's chief assistants in the work were appointed to carry it on during his illness. It is now announced that in accordance with the wish expressed by Mr. Street, the First Commissioner of Works has assented to the association of Mr. Arthur Blomfield with Mr. Arthur Street for the purpose of carrying out the designs.

**The Orange-peel Danger.**—Notwithstanding that Colonel Henderson, chief commissioner of police, has issued orders to his men to apprehend persons guilty of wilfully throwing orange-peel on the pavement, the streets and pavements in the main thoroughfares of the metropolis continue to be strewn with the parings of oranges, and numerous accidents are continually being reported. One daily paper alone mentions eight or nine serious cases of accident, such as fractured limbs, as having been admitted to St. Thomas's Hospital during the last few days. Of course, no thoughtful person would thus endanger the safety of others, but the number of accidents from this cause would be greatly lessened if those who would never think of jeopardising the safety of the public in this way would go a step further in their consideration for others, and remove the danger by kicking the treacherous peel into the gutter, as they have opportunity.

**Memorial of Dean Stanley.**—A meeting of the General Committee for the Dean Stanley Memorial was held on Tuesday afternoon, in the College Hall, Westminster Abbey, the Prince of Wales in the chair. It was announced that the sum of 3,350*l.* 14*s.* 6*d.* had been already subscribed. It was resolved that the execution of the recumbent figure, to be placed in Henry VII.'s Chapel, should be entrusted to Mr. Boehm, A.R.A., Mr. Pearson, R.A., the architect to the Dean and Chapter, being consulted as to the tomb upon which the figure is to rest.

**Public Safety at the Liverpool Theatres.** A meeting of the Liverpool magistrates has been held to consider the means of exit from the theatres and places of amusement; and it was resolved, in view of the public safety, to appoint a committee of magistrates to consider the question, and to visit the theatres, and, if necessary, call in professional advice. A step in the right direction.

### TENDERS

For Brockley Presbyterian Church, Brockley, London. Messrs. J. McKissack & W. G. Rowan, of Glasgow, architects:—

Higgs & Hill .....	£10,338 0 0
W. J. McGregor .....	10,066 11 11
Hayard, Bros. ....	9,510 0 0
Dove, Bros. ....	9,203 0 0
Staines & Son .....	8,634 0 0
Fatman & Fotheringham .....	8,341 0 0
J. Devlin .....	8,033 0 0
L. H. & R. Roberts .....	8,068 0 0
Lucas & Son .....	8,043 0 0
T. H. Adamson & Son (accepted) .....	7,324 0 0

For the general making up of Tumpike-lane, Horsney. Mr. T. de Courcy Mead, surveyor:—

Strachan & Co., Wood Green .....	£1,122 0 0
Walker, Upper Holloway .....	1,100 5 6
Adams, Hackney .....	1,050 0 0
John Bell, Wood Green .....	1,049 0 0
William McKenzie & Co., Moorfields-street .....	1,028 0 0
Dunmore, Crouch End .....	1,019 0 0
Pursey, Hoxsey .....	997 0 0
Ford & Everett, Westminster (accepted) .....	930 0 0
McDowell & Dawson, Stoke Newington .....	938 0 0

For rebuilding premises in Hanway-street and Hanway-place, for Miss Burns. Mr. L. Solomon, architect.

Quantities supplied by Messrs. Williams & Gorton:—

Simpson & Son .....	£2,429 0 0
Fatman & Fotheringham .....	2,328 0 0
Years & Co. ....	2,304 0 0
Yea .....	2,297 0 0
Dowd .....	2,254 0 0
Palmer .....	2,145 0 0
Smith, Bros. ....	1,874 0 0
Roberts (accepted) .....	1,773 0 0

For alterations and repairs to the Old Age public house, Hackney-road, for Mr. John North. Mr. J. G. Needham, architect:—

Mann .....	£268 0 0
Dickerson .....	885 0 0
Hawkins .....	676 0 0
Walker (accepted) .....	553 0 6

### Pestering.

Pringle .....	74 10 0
Hogers (accepted) .....	74 10 0
Christian .....	19 15 0
Steedman .....	87 10 0

For building a house, Disraeli-road, Forest Gate. Mr. J. G. Needham, architect:—

W. Needham (accepted) .....	£230 0 0
Stable .....	300 0 0

For roads and sewers on the Crown Estate, St. Margaret's, Richmond, for Mr. Edward Lloyd. Mr. Robert Evans, surveyor:—

Messrs. Wilkes & Co., Bishopsgate (accepted).

For new Congregational church, Deal. Mr. Joseph Gardner, architect. Quantities supplied:—

Hayward & Cottle (accepted).

For alterations at the Wh to Hart, Vice court, Commercial-street, for Messrs. Mann, Crossman, & Paulin. Mr. E. Shum, architect:—

W. & H. Salmon (accepted) .....

£239 15 0







# The Builder.

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SATURDAY, JANUARY 14 1882

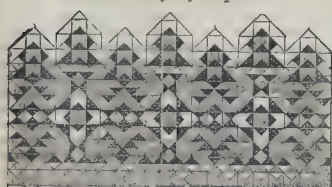
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Muntz's "Life of Raphael."



THE editor of this English version of a French biography of Raphael\* observes, no apology is necessary for a new biography of the painter, though we could have wished that such a biography should have come to us in an original English form rather than in a

translation, seeing that we certainly are not without those among our own countrymen who should have been capable of doing such a work exceedingly well. No translator's name appears to the present life; at least, we do not gather that the editor is the translator, and no other name appears. The translation is, however, fairly well and idiomatically done, with the exception of occasional slips, though somewhat dry and formal in literary style.

We cannot, however, look on the book with entire satisfaction, as in some points it does not fulfil all that we might expect from such a biography; and any work of this kind which is not entirely satisfactory is vexatious, because its republication in translation inevitably bars the way to the production of any better life from an English author, for, at all events, a long time to come. In one department the book is admirable,—that of the illustrations, which are very numerous, mostly well executed (except in a few cases, such as the engraving of the Sistine Madonna, which is certainly inadequate), and selected so as not only to give memoranda of many of Raphael's greatest works in their complete form, but also a large number of the extant sketches and studies for them. But it is, to begin with, published in a very inconvenient shape,—that of one thick and unwieldy volume, very uncomfortable to read. That is a more matter of outward form, not, however, altogether unimportant; for the size and shape of a book often have a good deal to do with its being more or less read. But the style of the book is heavy and its arrangement complicated, and rather wanting in concentra-

tion and continuity; and it is the work not of a critic, but of an enthusiast, who is continually going out of his way to urge and to illustrate the superiority of Raphael to all other artists. This is a very common fault in biographies, and certainly not least so in the biographies of artists: it is not unnatural that it should be so, since great admiration for a character is often the first moving cause towards undertaking the labour of writing his life. At the same time, the value of an artistic biography is very much impaired by such a spirit of indiscriminate admiration, even when the subject of it furnishes so much excuse for this weakness. It is more to the advantage of public education in regard to art that a biography of a great artist should present an example of calm and judicious criticism rather than of enthusiasm. M. Muntz's work, however, comprises a great mass of information, and is understood to be based upon the most recently discovered data, and therefore, as the expression is, "brought up to date."

In the early part of the biography the author appears to appreciate very correctly the degree and nature of the influence which Raphael's teacher, Perugino, exercised upon him. It was shown much more in regard to general feeling and choice of subject than in drawing and composition. In respect of these more purely artistic qualities, probably few great artists have ever been more early independent of mere educational influences, and this is the more remarkable in Raphael's case, because later in his career he showed, as is well known, a tendency to assimilate the style of Michelangelo after he had come under the influence of the latter, and so far as an artist of such opposite temperament could assimilate it. But from Perugino he seems really to have inherited mainly a leaning towards especially Christian subjects. If, in his early period, he painted a knight, it was always a Christian knight engaged in some sacred combat, the early work, "The Vision of a Knight," in our National Gallery, may be taken as a reproduction of the spirit of Perugino, although the two figures who stand on either side, exhorting or tempting the knight, already exhibit the peculiar grace which was to grow up to perfection (perhaps were to be carried sometimes to the length of an imperfection) in his later works. But in such a design as the cartoon of the Annunciation, from the Louvre Museum (engraved p. 71), Raphael seems, for the moment at least, emancipated from the stiff manner of Perugino, and treats the subject with a vivacity completely his own. The composition is a very graceful architectural interior, through the arcade of which is seen a stretch of country beyond. On one side is seated the Virgin; from the other side the announcing angel almost runs in, with outstretched wings and drapery flying behind him, as if on a joyful errand, allowing of not a moment's pause. The figure is essentially dramatic, a quality which Perugino certainly never suggested. The exquisite and well-known design of the marriage of the Virgin illustrates Raphael's

power, at an early period in his career, of significant and pointed grouping of his figures, so that all seem in direct relation to each other, and each has its share in the whole action. M. Muntz draws attention in one paragraph to the very different character of Perugino's work in these respects. In his figures, of whatever intended personality, there always lingered the stiffness and artificialism bequeathed from Medieval art. "An interval of centuries" seems to separate his Sibyls from those in the Sistine chapel, and his different personages "are placed beside each other, standing badly and not knowing what to do with their hands. They look at each other in a vacant sort of way, as if they had nothing to say to each other, and there is a want of the conviction and logic which go to make up a *chef d'œuvre*. But if the artist had placed them in different attitudes, the composition would have been neither better nor worse, and here is the difference between Perugino and his pupil, for all the creations of Raphael are by necessity what they are. The least change in them would destroy the whole symmetry and pervert the artist's meaning." A perfectly just criticism should have added that in not a few instances the grace of attitude and composition exhibited by Raphael is carried to the length of appearing too conscious, and conveying the impression that the actual and vigorous expression of the leading idea was with him, at times, too palpably second to the consideration of elegant and balanced effect; but the life and nature of his early compositions, as compared with those of his master, are no doubt among the most powerful testimonies to the individuality of his genius.

The main points in Raphael's life may be briefly touched on here, by way of refreshing the memory in regard to them. His father, Giovanni Santi, was one who had also chosen what he himself called "the wonderful and most famous art of painting." He married the daughter of a tradesman of Urbino, and their son Raphael was born on March 28th, 1483. It seems probable that it was at about the age of sixteen that he was apprenticed to Perugino, and thus became in the first instance a disciple of what is known as the Umbrian school. His father had died some four or five years before this; from him, in all probability, he would have received his first instructions in drawing. The author gives a few notes as to the outer aspect of the town of Perugia, which are of some interest in themselves, but which also show evident traces of ignorance on the part of the translator, who has translated, apparently, the words "*rococo* style" into "rock-work style," and the "*ogival*" of the French into "*ogive*," instead of its English architectural equivalent, "Gothic." The palaces in the square, says M. Muntz, are a kind of architectural palimpsest; "eighteenth-century windows have replaced those of the Renaissance, which, in their turn, had taken the place of original Gothic windows." While each epoch has made its

\* Raphael: his Life, Works, and Times. From the French of Eugène Muntz, Librarian to the Ecole Nationale des Beaux Arts. Illustrated with 101 engravings in the text, and 43 full-page plates. Edited by Walter Armstrong, B.A., author of "Alfred Stevens," &c. London: Chapman & Hall, 1882.

† We adopt in this article, for convenience sake, the spelling of the name as used in the book.



mark, the fourteenth and fifteenth centuries are predominant, and so Perugia retains the aspect of a city in the Middle Ages in which the Renaissance has left but a faint trace. Going down to the lower town and passing in front of the triumphal arch, which is buried, so to speak, amid these buildings, so different in style, the Middle Ages are still before our eyes. Nothing can be at once more irregular and picturesque than the steep and winding streets, which seem an insult to modern architects and their passion for symmetry and order. At each turn the broken nature of the ground produces the most singular contrasts. Turning one corner, a vast panorama unfolds itself, and a little further is to be seen a small plot of ground, encoloured by ancient houses and bathed in sunlight. Pots of flowers, fastened by iron hoops driven into the walls, are suspended near the windows against the reddish-grey walls, the bright hues of pinks and wall-flowers coming out well against the brick and stone of the wall. Here and there, too, as at Assisi and other towns in Umbria, an old fresco with a likeness of the Virgin is to be seen under the cover of a ruined pent-house, adding a further touch of soft melancholy to the scene."

The touch of melancholy belongs only to the modern spectator and the modern aspect of the town, of course. We quote the passage as one of the not very many picturesque bits of writing in the book. It would be interesting to consider whether any traces of the scenery amid which his artistic education was acquired are to be found in Raphael's backgrounds and accessories. That the Medicean architecture of Perugia would have had no other influence upon him seems certain enough; he, in fact, hated, or, at least, utterly despised, Gothic architecture, as completely as any artist of the Renaissance could.

Raphael remained here, where the Coronation of the Virgin and the *Spasialio* were painted, until he went to Rome in 1508. In the meantime he was moving about sufficiently, to Siena, Urbino, Florence, and elsewhere, to increase his experience of artistic work, and prevent his becoming a mere disciple of the Umbrian School. He must have already, about 1504, have acquired a considerable reputation, as Pinturicchio sent for him to Siena to advise and help him in the frescoes he was painting in the Library of Cardinal Piccolomini. In October, 1504, it is certainly known that he went to settle for a time in Florence, in order to improve himself in his art in the city where there were the warmest interest in art, the keenest criticism, the greatest opportunities anywhere save at Rome, and the rivalry of other distinguished men. Here he formed a kind of arm's-length friendship with Michelangelo, and must have been well known in Florence, as he got many commissions there, though the author notes it as remarkable that there is not a line about him amid the references to artists in Florence at that day, that his name even is not to be found in Albertini's "Memoriale" of pictures and statues of note in Florence, though Raphael painted some of the finest and now most celebrated of his "Madonna" pictures while there, and also some of his finest portraits. His move to Rome was in 1508, where, from a sonnet, given in the original and in translation, he seems to have been deeply impressed at the sight of the remains of Roman greatness around him. Here he was at once employed by Julius II., whom he has immortalised in that wonderful portrait which seems to give one the whole history and character of the violent, irritable, self-willed old ruler, who was nearly as arbitrary about the artistic work done for him as about everything else, but had the great merit of wanting great things done for him, and not being content with small ones; and Raphael found also a munificent patron in the great merchant and millionaire, Antonio Chigi. The latter appears to have been a kind of Bosworth of his time. "His splendid villa near San Giovanni Fiorentino failing to satisfy him, he had a palace built near the Porta Settimiana, and Julius II., when he went to inspect the progress it was making, remarked, in order to excite Chigi's emulation, that he doubted whether the building would be equal to that which the Riario's were then erecting. This made Chigi so jealous, that he vowed that his stables should be more sumptuous than the palace of the Riario, and he kept his word."

Raphael's great work for Julius II. was, of course, the paintings in the chambers of the Vatican. The "Camera della Segnatura," containing, among other masterpieces, the School

of Athens, and the dispute of the Sacrament, having occupied the painter three years, he was commissioned to paint the room now known as the chamber of the Heliodorus, and in which the painter's art was dedicated to the symbolical representation of the power of the Church, and especially of the reigning Pope; for if Julius never said "L'Eglise, c'est moi," he, at all events, lived up to that sentiment. Under Leo X., utterly different man as he was to the stern Julius, Raphael experienced the same appreciation as under his predecessor; and Leo, in fact, urged on the completion of the Vatican decorations, inducing the painter to design for the Loggia also simultaneously, so that the whole might be finished together; the arabesque decorations being probably designed by Raphael, and then carried out by other hands while he kept a surveillance over them. From Leo X. came the commission for the immortal cartoons, far too fine in subject and execution for tapestry work, and concerning which we may think ourselves fortunate that we possess Raphael's original work, though regarded, when it was done, as merely a means to an end. To the latter part of his Roman life belong his two other greatest, or at least most renowned works, the Sistine Madonna, painted for the Convent of San Sisto, at Piacenza, and the Transfiguration, which was one of two altarpieces ordered by Cardinal Giuliano di Medici, in 1517, for the Cathedral of Narbonne, the other commission being to Sebastian del Piombo, for his great picture of the "Raising of Lazarus." By the original, there is reason to believe, chosen the Resurrection of Christ as his subject, as a companion picture to the "Raising of Lazarus." Why he altered the subject does not appear; he evidently took the number interest in the new subject, from the number of extant studies for various figures in it. As every one knows, he died while almost still at work on it, on the 6th of April, 1520. The picture seemed then, no doubt, too precious to part with, and the Cardinal sent a copy of it (by Penni) to Narbonne, presenting the original to the Church of San Pietro, in Montorio; whence it was "looted" eventually by the French, and restored to Rome by us in 1815.

The critical remarks of M. Muntz in regard to Raphael's genius are scattered through the biography rather at random, and there is hardly any definite attempt to sum up his characteristics as a painter when considered in reference to the work of his contemporaries, or in regard to any broad theory of painting. In allusion to that large and beautiful class of paintings by which he is popularly known all over the world, his Madonnas, we notice (p. 159) some observations in regard to the relations of these to Nature. The author observes that Raphael as an ardent student of Nature, found great difficulty in persuading himself to substitute for the research after life and truth, the search after expression (after the special expression demanded by the subject, we suppose, is intended). "It would have been easy for him to have expressed with more force the various sentiments represented by the Virgin, her Son, and St. John, and to have excited more lively though perhaps less deep emotion in the mind of the beholder had he, like the painters of Bologna, been content with arbitrary composition, and subordinated everything in the way of truthfulness to some theatrical effect. He was two or three times tempted to do this, notably in the *Terranova Madonna* (in the Berlin Museum), and in various studies for the 'Virgin in the Meadow,' where he represents the infant St. John with his arms crossed and bowing before the child Jesus in an attitude of profound veneration, or kneeling before him with a fervour which has nothing child-like about it. But he discovered his error, and in the final composition all trace of exaggeration disappeared. His genius,—the robust and wholesome genius of the Renaissance,—had no sympathy with an abstraction, and his preferences were for a figure worthy to take its place in painting, and to have an individual life, while his subjects were in conformity with their character and their age. Thus, his children were real children, and though it may be thought that in some cases the sentiment of filial tenderness is overdone, there is never anything theatrical or artificial about them. This, if I am not mistaken, is the secret of the charm which the Florentine Madonnas of Raphael have exercised for three centuries, and of their eternal youth."

The author rather misses the point here. It is certainly true that if Raphael had made his

Madonnas more distinctly ecclesiastical pictures, the interest in them would have depended greatly on the presence or absence of Church feeling and Church faith in the spectators. He remained, however, sufficiently near to nature to charm spectators of all countries quite irrespective of their creed. But the element of weakness in these exquisite works is that they are not decisively either one thing or another. They are not satisfying to the feelings of those who look for religious and devotional expression in such paintings, nor could it have been expected that they should be, seeing that they were painted in an age and for a society which had practically discarded religion and was living entirely for pleasure, intellectual or otherwise. This is the basis of the criticism which is passed upon them by some earnest-feeling writers on art in this country; that they are without earnestness, and give the impression of being painted with the deep feeling for their avowed subject. On the other hand, they are just far enough from nature, they have on them just enough of what to many minds is the taint of superstition, to present an incongruous element to those who would look at them as types of natural beauty, and who find them too much conventionalised to give entire satisfaction in that light. This is strikingly illustrated by comparing the first studies from life for some of the Madonnas, given in *facsimile* in this book, with the finished design. There is a life and verve in some of the sketches which seems to be refined away when the group comes to be toned down to the conventional expression of the Madonna's face and manner; lovely as the latter is in most cases, we cannot help feeling that Raphael might have given us something even more inspiring had he omitted the quasi-religious element altogether, something that would be more filled with the "one touch of nature." This is more felt, perhaps, when we go from one to another, and are struck inevitably by the sameness of the expression and motif, though in his finest examples Raphael contrived wonderfully to vary the composition while carrying out precisely the same general idea; and the exquisite art with which the figures are grouped so as to produce the utmost harmony and repose of life without the appearance of contrivance cannot be too much admired. But it is not surprising that some should feel that they would rather have real breathing life and nature and feeling than so many of even these exquisite and graceful Madonnas:—

"Her, San Sisto names, and Her, Foligno,  
Her, that visits Florence in a vision,  
Her, that left with lilies in the Louvre—  
Seen by us and all the world in circle."

The great Roman paintings, and the cartoons, stand on higher ground. In so far as regards form, composition, and expression, it may certainly be said that here Raphael reached the highest possible completeness of painting. While there is nothing startling, nothing abnormal or forced in these great works, there is at the same time no trace of that comparative insipidity and conventionality of attitude and expression which is the drawback to the enjoyment of the Madonnas. Socrates arguing in the School of Athens, Paul preaching, are figures which give us, with the intuition of genius, an ideal of the characters which we at once feel to be true, and which, once seen, can never be forgotten. There are grander and more powerful conceptions by Michelangelo than any that Raphael has produced, and he was unquestionably the greater man; but it must always remain a question whether the man who produced occasional colossal conceptions amid a good deal which was forced and abnormal in taste and feeling, was greater than he who, like Raphael, was able to produce so many great works in which such an even balance of power and beauty was maintained. One defect Raphael shared with his giant rival,—he never was a great colourist, and he was not, even in one sense, a great painter; he was a great designer and draughtsman: he had not that power over richness of tones and surfaces which was the glory of the great master of the Venetian school. Titian was an incomparably greater painter than Raphael, but it may be questioned whether he was so great an artist, in the intellectual qualities of art, and the question comes with all the more force when we remember the age at which Raphael died.

M. Muntz gives some interesting particulars as to what he has been able to ascertain in



regard to Raphael's method of fresco painting, and the time which his great works in fresco occupied. The preparation of the cartoon, and the transference of it to the plaster by pricking and pouncing, was, of course, the ordinary operation in such cases; Raphael seems to have touched in the outline with the brush afterwards and availed himself of this opportunity to remodel it if necessary. As to the time occupied in execution, M. Muntz makes these observations:—

"It is impossible to say how much time Raphael devoted to the execution of his drawings and cartoons, but so far as regards the mural pictures themselves, the bevelled edges of each day's work,—an arrangement which was necessary in order that the mortar of one day should adhere to that of the next,—enable one to follow the progress of the work step by step. I have calculated that in the *Incendio del Borgo*, the large group to the left, composed of four figures, all more than life-size, was painted in a week. In the "School of Athens" each figure took less than a day." The architectural parts were executed with prodigious rapidity, and as Raphael generally had a very large surface prepared by the mason, the mortar was often still too wet when he began to paint, the consequence being that there are deep cracks in various parts of the portion. The after touches, it is true, must have necessitated an addition of work, and this is especially noticeable in the "Parnassus," where the sky is fresco, while the laurels which overshadow the Muses are in *tempera*, the consequence of which is that the colour comes off on the finger at the slightest touch. But about 1516 Raphael had become so proficient in fresco work, that he rarely had occasion to go over the ground a second time."

Among the later chapters of the work is a very interesting one on "Raphael and the Antique," in which the author considers the effect which the study of antique models exercised upon the painter's later style. He is, no doubt, right in tracing to this influence the change from the paintings of the Florentine period, the graceful and rather sentimental Madonnas, to the far more "Classic" and, as in one sense it may be called, Pagan style of his later Roman paintings. We must pass over this, however, and say a word as to the chapter dealing with Raphael as an architect. The part which he played in the construction of St. Peter's was in reality, of course, very small; but his appointment as architect was evidently highly valued by him as a post alike of great honour and great interest, and led to his systematically studying what were then regarded as the true principles and models of architecture; much more systematically than he would probably have done otherwise. He felt fully the responsibility of the position, writing in one of his letters that the Pope, in thus honouring him, had also laid a great burden upon him adding,—

"I hope I shall not fail, especially as my model pleases his Holiness, and has obtained the sanction of many competent judges; but I aim higher than this. I wish to discover the principles of the beautiful forms of the antique. Perhaps my flight will be like that of Icarus. Vitruvius gives me much enlightenment, but not enough." The architect introduced into many of his paintings shows a strong feeling for the beauties of Classic architecture. But of the power of Gothic architecture he had not an idea. M. Muntz quotes at some length his opinions thereon, expressed in the "Report" addressed to Leo X., in which he proposed (if the Report is his, as there seems reason to believe it is) to collect the measurements of every existing Roman building of antiquity, and by means of these to attempt a reconstruction of the capital of the Cæsars. The Report, after deploring the utter extinction of architectural art with the fall of Rome, continues, "this German architecture then became general; an architecture opposed in every way, as we can now see, to the beautiful style of the Romans and ancients. The latter, putting out of the question the main portion of their edifices, executed cornices, friezes, architraves, columns, capitals, bases, of the greatest beauty; all the decoration was as good as possible. The German, on the contrary, whose manner is still in favour with many, often used for ornaments or supports stunted badly-executed figures, strange animals, or figures and foliage treated without

any taste whatever; nothing could be more opposed to good sense. Still this architecture has a meaning, it is an imitation of uncultured trees" (!), "of which the branches make, when bent and tied down, sharp-pointed two-centred arches. Although this meaning may not be completely condemned, it lays itself open to adverse criticism. Indeed, the huts described by Vitruvius, in his dissertation on the origin of the Doric style, with their beams joined together, their posts for columns, their pediments and roofs, are much stronger than pointed arches which have two centres. Do not mathematicians teach us that a half-circle, every point of which thrusts towards a common centre, can support a much greater weight? Besides its weakness, the pointed arch has none of the grace of the perfect circle; Nature herself uses no other form than the latter."

Apparently, in Raphael's theory, architecture was simply the application of ornament to a building. It is curious to find so great an artist laying down principles so precisely the reverse of those which really characterise true architecture, though, of course, one could not expect otherwise in the age and under the influence amid which Raphael lived; it is still more curious to find his modern biographer quoting such criticism with evident sympathy, and citing the opinion of an eminent living French writer (name not given) as to the irrational character of Gothic architecture. Such observations show how much some writers on art are still at sea about architecture. But Raphael's practice was somewhat better than his theory, and he had more true architectural taste and perception than Michelangelo evinced. His well-known Pandolfini Palace, of which we reproduce the view given in M. Muntz's book,\* shows, in its powerful treatment of the rusticated doorway and angles, and the simple but suitable arrangement of the windows, a true feeling for architectural expression, free from pretence or affectation, and arising naturally out of the necessary features of the building.

It is singular how little we seem really to know about the man Raphael, in spite of the prominent place he filled in an age not so very remote from our own, and abounding in documentary record. A few letters give evidence of that amiable and affectionate disposition with which he was universally credited; and a romantic halo hangs about the story of his "Fornarina," accompanied by an uncertainty as to the real nature of the attachment and the real character of the evidently plain and un-cultured woman who has won a kind of nameless immortality in connexion with his name: but our personal knowledge of him is singularly limited in comparison with the marvellous qualities and fecundity of his artistic achievements. We carry in our minds the figure of a person of charming manners, and of a delicate physical beauty strangely at variance with his immense artistic activity; but we have little definite idea as to the speech and manners and daily life of the slight, gentle, ethereal-looking man who has filled the world with the fame of works which, to quote our biographer, "breathe an exquisite goodwill, a serene and profound faith in humanity, and a love for all that is pure, and great, and noble."

#### THE PRUSSIAN ACADEMY OF ARCHITECTURE ON FIRE IN THEATRES.

AFTER the disastrous catastrophe in the Nice Theatre in March last year, when over eighty persons lost their lives, Prince Bismarck, by command of the German Emperor, requested the Prussian Academy of Architecture to draw up a memorandum embodying its opinions as to the measures requisite to ensure safety from fire and its consequences in theatres. It has only been since the far more terrible calamity at the Ring Theatre in Vienna that this document has seen the light.

This memorandum, which is entitled a "Summary of the Regulations and Arrangements serving to Diminish Danger from Fire in Theatres," we give in translation as follows:—

I. *The Sites of Theatres.*—Large theatres should be erected on open situations, and should be kept detached and separated from other buildings by the widest practicable intervals. According to the police regulations respecting buildings in Berlin, all new theatres are to be divided from other buildings, and from the

boundaries of the neighbouring sites by an intervening space of 51 metres in width. A smaller interval than this is allowable if the neighbouring buildings are quite fireproof. (According to the police regulations in Paris, 3 metres' distance only is required when the neighbouring walls are fireproof.) In Berlin, new theatres, of small size, are allowed to be built contiguously with other buildings, provided the walls are fireproof and of sufficient thickness. The minimum thickness to be recommended ought, as prescribed in the Paris regulations, to be not less than 25 centimetres. Herr Fölsch gives 2 metres as the height to which the fireproof walls ought to rise above the level of the roof; but a smaller height, say one-half or six-tenths of a metre, would be sufficient. Where existing theatres are separated only by narrow lanes or courts from the neighbouring houses, the latter should be required to provide all the windows and doors opening on to the theatre with iron shutters or curtains.

II. *On the Construction of Theatres in General.* The outer and party-walls of theatres ought all to be built of massive masonry; floors and ceilings ought, as far as practicable, to be fireproof; corridors especially ought to be protected by vaulted ceilings. In the construction of the roof iron ought to be employed, and the use of wood avoided to the utmost practicable extent. (The Paris regulations prescribe that the ceiling above the auditorium must be a fireproof structure, entirely of iron and plaster.) So far as wood is employed for this purpose, it should be impregnated with some material protecting it against the flames. The experiments which Herr Fölsch last year made with a preparation of this nature in Berlin were attended with very favourable results. There may be real obstacles and sound objections to the applications of such protective preparations to curtains, stage properties, dresses, &c., but there is no reason why such means should not be used for impregnating the wood employed in the construction of the building.

III. *Respecting the Internal Arrangement of Theatres.*—Both the auditorium and the rooms used by all persons employed in theatres must be separated from the stage by fire-proof walls. All doors in these walls are to be of iron, and made so as to close automatically. The opening between the stage and the auditorium,—that is, the front of the stage,—must be provided with an iron curtain to shut it off from the rest of the house. The utility of an iron curtain has been disputed in several quarters. But it remains beyond doubt the most effective means of preventing a panic seizing the audience in case of an outbreak of fire on the stage. According to the information we have received, curtains of this description have recently rendered excellent service in the Court Theatre at Munich, and in the new theatre at Frankfurt-on-the-Main. Such a curtain prevents the smoke penetrating into the auditorium, while, in the absence of such an expedient, the strong current of air moving from the stage to the chandelier draws the smoke and gases from the fire into the body of the theatre. Another point is that the store-rooms for the stage decorations, and so forth, ought to be kept separate from the theatre. The lodging of servants or employés on the theatre premises, too, should be avoided or restricted to the utmost practicable extent.

Most particular attention must be paid to the construction of the stairs, corridors, and passages of egress. Stairs must be built fireproof, and vaulted underneath. They should be in long flights, without turning, and have strong handrails on either side. As regards the stairs for the auditorium more especially, they ought to be capable of being easily found, and should be arranged so that the public will leave the theatre in as many directions as possible, radiating from the centre of the building, and so that they may reach the open air by the shortest possible line. The minimum dimensions for the width of the stairs required by the Paris regulations are 1½ metre for the upper flights, and widening in the lower flights in proportion to the number of persons who would pour into them. As regards the width of the passages in the pit, and the total breadth of the ways out into the corridor, it is necessary that definite dimensions should be assigned, bearing a proper proportion to the number of seats. In Paris, the requirements are generally either a central passage of 1½ metre, or two side gangways of 1 metre in breadth, while the openings on to the corridor must have a total breadth of 6 metres, and be as near as possible to the vestibule.

\* Of course, the time occupied in the broad handling of a fresco style cannot be put in comparison with that required for the delicate and detailed realistic treatment of flesh, for instance, in oil painting.



The corridors in all tiers should be of adequate width, and should not be used as cloak-rooms. The latter should be immediately adjacent to the corridors, and so arranged as not to give rise to opposite streams of people. The doors of all the exits must open outwards. If the doors are double or folding, then the wing which is generally unopened must be capable of being opened as easily as possible. The Paris regulations require that the total width of all ways out into the street shall be six metres for the first thousand seats, and three-fifths of a metre for every additional hundred. Herr Fölch, for the same purpose, assigns two metres for 600 seats, and 35 centimetres for every hundred more. He considers that every house ought, under ordinary conditions, to be capable of being cleared in four to four and a half minutes. Further the exits must, as much as possible, lead away from the stage, so that in case of a fire breaking out there, no person in the house should, on his way out, be forced to go nearer to the flames, but that every step should take him away from them and nearer to the open air.

The windows ought nowhere to be defended by iron gratings. By the Paris regulations, iron ladders, regardless of appearances, must be fixed to the side fronts and in the inner courts of the building so as to facilitate escape in case of necessity.

All approaches to the roof must be closed by iron doors, closing of themselves. The gas is to be arranged under three different and independent groups, one for the auditorium and connected apartments, another for the stage, and the third for the managing department. The tubes must never be of any metal but iron; the gas-lights are as far as possible to be fixed and not with movable arms or brackets. The Paris regulations further require that the lighting of the curtain shall be effected by means of flames burning downwards and defended by guards; and that the wires for electric lighting shall be contained within inflammable casings, as, in case of interruptions the wires acquire very high temperatures.

The arrangements for warming the building must be according to some system of central heating by pipes. Iron stoves must be prohibited under all circumstances.

Theatres ought to be provided with a water supply in all parts, and under high pressure. Where the pressure is not sufficiently high to reach the highest portions of the edifice, there ought to be on the roof reservoirs of sufficient capacity or so-called compressors. The water-cocks ought to be sufficiently numerous, and part of them should be as near as possible to the stairs, so that the firemen may be able to keep their position as long as possible. The Berlin regulations of June 29, 1881, lay it down that the arrangements for extinguishing fires are to be provided and kept in order in accordance with the rules of the City Fire Brigade department. It appears desirable that definite principles should be settled as regards theatres.

There has been a good deal of opposition to the proposal for a so-called artificial shower on the stage. In several theatres, however, as Munich, Götting, and Frankfurt, this system has been applied, and has done good service. There is, perhaps, some truth in the objection that the apparatus is difficult to manage, and that the water does not at once reach the spot where it is wanted. On the other hand, the apparatus offers the advantage of continuing to act automatically after firemen have been compelled by the flames to withdraw from the interior of a burning building. That this apparatus cannot be regularly tested without doing much damage to the stage through the quantity of water it pours down is, of course, an objection to it. But we must remark, that if the pipes are of copper, there is no need to fear that the fine apertures will be closed by rust. Nor is it probable that dust or any other cause could close the openings so as to prevent the water coming out when required.

In the above we have touched upon the essential points connected with the architectural regulations and arrangements for the prevention of fires in theatres. What influence the eventual introduction of the electric light as the exclusive source of illumination in theatres may have upon the question of danger from fire in such buildings cannot at present be determined. It may be remarked that it will probably not be found possible to draw up regulations under the three heads adopted in this memorandum because the necessary measures for cases under different heads will be more or less the same

This, however, will present no great difficulty to the drawing up of a code of rules to cover every essential requirement as pointed out in the preceding remarks.

Since the preceding memorandum was published in the *German Official Gazette*, it has been announced that the Architectural Academy is engaged upon a much more detailed report upon the same subject. In this it is availing itself of the assistance of the Prussian Provincial Administrative Boards, as well as of a number of distinguished architects and other experts, more particularly persons acquainted with the requirements of the stage and management of theatres, as well as with the extinction of fires. This document will probably be some time in preparation, but, when ready, will be published by the Prussian Ministry of Public Works.

#### THE BURLINGTON HOUSE LOAN EXHIBITION.

THE Dutch pictures of the year include, besides the examples specially mentioned in our last notice,\* a good many satisfactory, sometimes more than satisfactory, specimens of well-known painters of the Dutch school or schools: Teniers and Ostade, Both, Cuyt and Hobbema. We have seen some such splendid examples of these and other Dutch masters here in previous years that we cannot expect to find this department of the exhibition so brilliant as it has sometimes been. The most important Teniers is the "Kermesse" (88), from Buckingham Palace, a composition of medium size, but containing a crowd of figures, of whom the centre group is thrown out in full and strong light in a very effective manner. The execution of detail is not, however, so crisp and powerful as in some otherwise less important works, such as the "Chapeau Rouge" (85), and the "Old Woman peeling Turnips" (108). The "Village Fête" is one of the painter's few large-scale pictures, one of a class which never seem to us pleasing on account of the artist's dingy and dreary colouring of the landscapes, which in this case, however, is pleasing as to mere drawing, though the colour is no better than usual. A good specimen of Metsu (92), "Lady pouring out Wine," is recognisable at once by the figure in the red bodices which he has so often painted; it is a small work with three or four figures only. Ostade's "The Nativity" (91) is a very fine specimen, not only for the usual qualities of rich tone and powerful effect, but for a certain rude pathos in the countenances of the Dutch boors who come to adore the infant Saviour. The Ostade lent by the Queen, "A Boor and his Wife in an Arbour" (114), differs a good deal from Ostade's usual manner in the brighter tone and the absence of that deep shadow effect which he usually was so enamoured of; the figures and accessories are painted with great minuteness. Frack Hals is represented by one of those bold dashing "Portraits of the Painter" (87) which he was so fond of producing; and there is a small powerful study of a head by Rembrandt (100) with the paint loaded on in thick lamps so as almost to produce the effect of relief. Rembrandt's well-known and extraordinary conception of "Christ and Mary Magdalene" (117) is lent from Buckingham Palace; with some touches of the painter's genius, it is too absurd when considered as an illustration of the subject.†

There is a good specimen of that overrated artist, Hobbema (62), a woodland scene, looking like a Constable with all the air taken out of it. Another example (80) shows a somewhat warmer tone than that cold, deathlike grey which was Hobbema's usual translation of nature's light. A more interesting landscape than either of these is a small one by Paul Potter (69), a quiet composition with a straight sluggish stream stretching away past some buildings, seen in warm evening light; it has probably been retouched or repainted in parts. There is a powerful little cattle study by Potter, "Bull and Cows" (112), in his best style of draughtsmanship. There are various Cuyts, with solemn and lazy-looking horses bestridden by equally lazy riders; one or two good Van der Neers; some Boths that are not much; in Gallery IV. is a fine Wouverman, "The Miseries of War" (229), a battlefield from which vic-

torious horsemen are hauling away captives from their burning houses, deaf to the entreaties of women and children: this is not only a very fine and effective work as a whole, but the separate horsemen are painted with even more than Wouverman's usual force and fidelity in dealing with such figures. In the same room is Rembrandt's life-size, and, in its way, capital, study, "The Portrait of his Cook" (234); the left hand is bad in colour, but the figure as a whole is remarkable as a hasty and powerful transcript of character.

The major part of Gallery IV., as usual, is devoted to specimens of early Italian painting, many of which are of the greatest interest. Sandro Botticelli's "Virgin, Child, and St. John" (196), a circular composition, is almost enough to justify the exaggerated praises which have been bestowed on this artist of late years, so delicate and luminous is the colour-effect, so spiritual the figures, so light and floating the draperies. It is difficult to believe the "Atalanta's Race" (195) to be by the same painter; curious it is, but feeble and ugly. Sir F. Leighton contributes a beautiful specimen of the peculiarly decorative art of Pietro da Sieva; mild, gentle heads, with long almond-shaped eyes set in a ground of decorated gold. This highly artificial picture is happily contrasted with Lucas Cranach's "Lucretia" (192), a charming painting of a German flax-haired *mädchen*, plump and rosy, but with a gentle sorrow on her face, a slight gap between her parted lips, as she prepares to plunge the sword into her bare bosom. The association of her costume is magnificent; the landscape seen through the window is almost sublime in its absurdity. Next we have Quentin Matsys, with his curious and elaborate "Adoration of the Magi" (193), where a crowd of figures of two opposite types of face, hook-nosed and bearded men, and square-faced and snub-nosed men, press forward, the latter bearing in their hands jewelled golden vessels, on the elaboration of which the artist has expended himself *con amore*. It is to be noted in such a work as this, absurdly materialistic as it is in some ways, that the painter does attempt distinction of race and national character in his figures; he does not, like the Ostades and Jan Steens, bring in only the men he sees in the street every day. This is observable also in Van der Weyden's painting of the same subject (189); there is a certain definite attempt at idealising. Carlo Crivelli's "St. George and the Dragon" (194) has the usual characteristics of the painter; the horse's furniture is realistically represented in embossed leather and nails let into the picture; the sky is an expanse of gold, the horse has no muscles, and his skin falls into curious creases at the bendings of the limbs; yet through all this antiquated mannerism we discern a spirit and power in the conception, in the manner in which the terrified horse turns his head as far as possible away from the dragon, and the determined action with which the knight swings his two-handed sword.

A very remarkable painting is that belonging to Mr. Magnire, and attributed (with a query in the catalogue) to Holbein, "Christ Mocked" (198). If it be not by Holbein, and in some respects it certainly differs much from the painter's usual style, it is at least difficult to say to what other known painter the figure on the right could be attributed. It is a picture containing only five half-length figures, in the countenances of two of whom the expression of scorn is most forcibly, almost painfully realised. The execution is sligher than is usual with Holbein, if it be his. Among other works in the same room, Andrea del Sarto's large painting of the "Sacrifice of Isaac" (208) is notable for the finely-drawn and conceived figure of the kneeling Isaac, a naked youth, behind whom rises the dignified full-robed figure of Abraham; the two figures are bent together in that perfectly consentaneous unity of line and action which is seldom seen in such perfection except in the compositions of Raffaele. Paris Bordone's "Hephestus and Thetis" (211), belonging to Sir F. Leighton, is a fine life-size group, very warm in colour, and exceedingly effective, though there is nothing remarkable in the conception: indeed, the Hephestus is but a very weak ideal of the god of the forge and anvil. Holbein's portrait of "Sir Thomas Cromwell" (222), Rubens's free and powerful study for the altar-piece of Antwerp Cathedral, "The Raising of the Cross" (220), and a brilliant flower-piece by Van Os (225), are among the attractions of this room; and in a central position on one of the walls is a splendid specimen of

\* See p. 3, ante.

† Why is the artist called in one place in the catalogue "Rembrandt van Rijn," and elsewhere "Rembrandt," as if they were two different men?



the peculiar powers of Panini, "The Piazza Navona at Rome" (209), lent by the National Gallery of Ireland. This, representing the occasion of a great festival, is a splendid piece of architectural painting on a large scale; but it is equally remarkable for the minute and careful painting of the crowd of small figures which occupy the space in front of the buildings. From the catalogue we learn that "the scene represents the Piazza on the occasion of a fête given there on November 30, 1728, by the French ambassador, the Cardinal de Polignac, to celebrate the birth of the Dauphin, son of Louis XV. Panini himself designed and arranged the fête, and painted the picture for the Cardinal, whose portrait is introduced standing in the centre."

Among the important pictures in the large room which we have not previously mentioned is an unquestionably genuine repetition (146) of Titian's "Venus and Adonis," belonging to the Earl of Normanton, and little, if at all, inferior to the National Gallery picture. Paolo Veronese's "Venetian Lady playing a Guitar" (153), lent by Mr. Woolner, is a sumptuous portrait of a sumptuous dame of the Venetian type. On the south wall is a small but notable collection of landscapes. Two Turners, "Pope's Villa" (175) and "Sea Coast, Hastings" (179), are hung as pendants to one another; the latter represents the painter's early style of cool colour and wonderfully fresh aerial effect; the former is probably somewhat later, and gives a beautiful and serene view of the Thames with the villa and wooded banks in the middle distance, bathed in the soft mellow evening sunshine. Two landscapes, with figures by Gainsborough, bear the same title, "The Cottage Door," (172, 177); they have somewhat the same characteristics; in No. 172 the concentration of light on the group of figures is effective, certainly, but somewhat too unreal and contrived. These appear, it must be confessed, somewhat tame and mannered when compared with Constable's splendid work, "The Look," referred to in our former notice. There is a large Gainsborough landscape in Gallery V., the property of Lord Penrhyn (265), representing a composition which the painter has repeated several times in its main features. The composition is beautiful, and the glimpse of the distance between the trees is very fine, but the mannerism of Gainsborough's trees is a great defect in this as well as in others of his landscapes. The large Gallery also contains two Claudes, a "Landscape" (145) and "The Pilgrimage of Sta. Paula" (149); the latter is one of Claude's sea-pieces, with architectural foreground, which represent a very mannered, though pretty, style of sea-painting. The former is a work in his finest style, remarkable for the aerial perspective of the hazy golden distance; it illustrates also Claude's effective manner of using buildings at various degrees of distance to increase the effect of perspective; the most distant building, only a small cube breaking the line of the landscape, carries on the eye far away over the scene, and yet far beyond this are successive planes of country receding into extreme distance. The value of the buildings in helping this idea of distance is perhaps even more evident in the "*Liber Veritatis*," where we have not the additional aid of colouring. A small landscape by Reynolds (184), is an interesting point in the exhibition, and a very beautiful little composition.

We omitted to mention before, Reynolds's picture of "The Piping Boy" (185), a half-length of a beautiful child with long fair hair, followed by a dog: in the warm and golden colour this painting suggests comparison with "The Strawberry Girl," and would form no bad pendant to it, though a little more ideal in feeling. It has probably faded a good deal, but the drapery is deficient in finish and texture; but the general style of the work is in Reynolds's finest manner. Among the curiosities of the exhibition is an interior with figures, by Turner (30), in which the effect of bright sunlight on the miscellaneous pile of articles in a laboratory is the object; in this respect it is a remarkable specimen of Turner's power of painting light: the figures are very poor, and probably introduced only to give a name to the painting.

**St. Bartholomew's Hospital.**—We understand that Messrs. Dunn & Soman have purchased for St. Bartholomew's Hospital fifteen acres of land at Snaresley for the erection of a convalescent home.

#### AN ORIGINAL FELLOW OF THE ROYAL SOCIETY ON SMOKE ABATEMENT.

It is not calculated somewhat to arouse surprise that the great fog and smoke nuisance with which London has allowed itself to be inflicted each year as winter sets in should only now, after 200 years and more have passed, be the subject of anything like serious consideration? It was not until matters had reached a culminating point that it was deemed advisable to urge the adoption of some steps towards the remedy of so self-inflicted an injury. Whether the results expected by the promoters of the Smoke Abatement Exhibition will in any measure be attained is difficult to decide; in the meantime, King Fog rules supreme, and even in these revolutionary days seems to find his regal power in no way threatened. We have endured his tyranny for over two centuries, with that placid and proper submission to the powers that be which so distinguishes the English character. Democratic complainers against the nuisance find themselves in the minority, not but what there have been champions for the popular rights of hygiene and common sense.

Just 220 years ago John Evelyn published, "at the command of his Majesty" (Charles II.), an interesting tractate, which, as may be imagined, is now rare, and which he termed "Fumifugium; or, the Inconveniences of the Air and Smoak of London dissipated, together with some Remedies, humbly proposed by J. E. Esq. MDCLXI. (1661)." As may be gathered from the title, Evelyn's is a warm attack on the fog and smoke nuisance which as far back as that date appears to have rendered the British capital infamous. The fervent words of the refined old diarist curiously chime in with the sentiments of many in the present day, and it is for this reason, we trust, that a summary of the quaint little quarto tractate may prove not uninteresting to our readers. It will form one more attack, supported by good authority, on a public nuisance, which it would indeed astonish old Evelyn, that accomplished gentleman of the seventeenth century, to find that we, his advanced and civilised descendants, should not yet have abolished from our noble city.

In his "Dedication," Evelyn explains how the idea of his little work was suggested by noticing in walking one day in Whitehall "a presumptuous smook to be issuing from one or two tunnels near Northumberland House and not far from Scotland Yard, and which did so invade the Court that all the rooms, galleries, and places about it were filled and invested with it." This "pernicious accident," he takes as the theme of his discourse, and appealing to the king's love of beauty, urging the injury caused by the smoke, he proceeds to speak of its injurious effect on the health. His "Dedication" dismissed, it is "to the reader" that his remarks are henceforth addressed. It is curious to find a writer who knew the Continent so well as Evelyn expressing already, two centuries ago, his disappointment at "the small advancement and improvement of public works in this nation, wherein it seems to be much inferior to the countries and kingdoms which are round about it;" and urging the adoption of "whatever any of our neighbours enjoy of more universal benefit for health and ornament, in sum, whatever may do honour to a nation so perfectly capable of all advantages." It is precisely the sentiment of so many in the present day on this very fog question, the amazement that "where there is so great an affluence of all things which may render the people of this vast city the most happy upon earth, the sordid and accursed avarice of some few particular persons should be sufficient to prejudice the health and felicity of so many. That men, whose very being is aer, should not breathe it freely where they may, but condemn themselves to this misery, is strange stupidity." "That this glorious and ancient city," continues our author, writing in the day when London resembled some of the few old towns still left, though in this direction at least we have made some advance since Evelyn's time, "which from wood might be rendered brick, and, like another Rome, from brick be made stone and marble, should command the proud ocean to the Indies, should wrap her stately head in the clouds of smoke and sulphur, so full of stink and darkness, I deplore with just indignation." Though progress has of late years been made, Evelyn's complaint, we are afraid, still holds good as applied to too many parts of the

metropolis. "That the buildings should be composed of such a congestion of mishaps and extraordinary houses, that the streets should be so narrow and incommod in the very centre and busiest places of intercourse (etc.), are particulars worthy of reproof and reformation."

With an original member of the Royal Society\* it may be imagined that the enumeration of the properties of "aer," the influences of climate, take in the discussion their due place, but the chief point is to show the importance of pure air; food we eat only at stated times in the day, while the air we continually breathe whether asleep or waking. "From these and the like considerations it might well proceed," continues Evelyn, enunciating a sentiment that cannot too well be borne in mind, "that Vitruvius and the rest who follow that master builder mention it as a principle for the accomplishment of the architect, that being skillful in the art of physic amongst other observations he sedulously examine the aer and situation of the places which he designs to build, the inclination of the heavens, and the climate, *sine his enim rationibus nulla salubris habitatio fieri potest*. There is no dwelling can be safe or healthy without it." That these considerations were observed in the original foundation of London is unquestionable; but returning to the smoke-polluted air of the metropolis, "it will be found to be but something extrinsic and accidental only which naturally does not concern the place at all, but which may be very easily reformed without any the least inconveniences." This "something" Evelyn, without more ado, roundly states to be "that Hellish and dismal cloud of Sea Coal which is not only perpetually imminent over our head, but is so universally mixed with the otherwise wholesome and excellent aer, that we withal breathe nothing but an impure and thick mist accompanied with a fuliginous and filthy vapour which renders them obnoxious to a thousand inconveniences, corrupting the lungs and disordering the entire habit of their Bodies, so that Catharrs, Phthisicks, Coughs, and consumption rage more in this one city than in the whole Earth besides."

Follows then a short dissertation on the nature of smoke, of which the most noxious of all, our author points out, is that of sea-coal, which in London alone exposes our metropolis "to one of the foulest inconveniences and reproach that can possibly befall so noble and otherwise incomparable a city." Under the combined influences of "culinary fires" and factories, the London of Evelyn's day, if we are to believe his picturesque description, was scarcely less begrimed than the London of the present; "for where," continuing his picture, for the truth of which any Londoner can fully vouch, "in all other places the air is most serene and pure, it is here collapsed with such a cloud of sulphur as the sun itself which gives day to all the world besides, is hardly able to penetrate, and impart its heat, and the weary traveler at many miles' distance sooner smells than sees the City to which he repairs." In every point the picture tallies, the "sooty crust" forming on everything, "spoiling the moveables, tarnishes the plate gildings and furniture, and corroding the very iron bars or hardest stones with those piercing and acrimonious spirits which accompany its sulphur, and executing more in one year than, exposed to the pure air of the country, it could effect in some hundreds. It is this horrid smoke which obscures our churches and makes our palaces look odd, which fouls our clothes, and corrupts the water, which scatters and strews about those black and smutty atoms upon all things which it comes, insinuating itself into the most precious repositories, diffuses a yellowness upon our choicest pictures and hangings, suffering nothing in our gardens to bud," and, on this point, Evelyn mentions a characteristic incident, which we quote in the author's own quaint words,—"Not, therefore, to be forgotten is that, which was by many observed, that in the year when Newcastle was besieged (1644) and blocked up in our late war, so, as through the great dearth and scarcity of coals, those fumous works, many of them either left off or spent but few coals in comparison to what they now use, divers gardens and orchards, planted even in the very heart of London (as, in particular, my Lord Marquis of Hertford, in the Strand, and my Lord Bridgewater, and some

\* Though the charter of the Royal Society is only of 1663, and Evelyn's "Fumifugium" was published two years previously, it is well known that the Royal Society was in existence many years before the granting of the charter. See Evelyn's "Diary."



others about Barbican), were observed to bear such plentiful and infinite quantity of fruits as they never produced the like either before or since, to their great astonishment, but it was by the owner rightly imputed to the penury of coal, and the little smoke which they took notice to infest them that year," and Evelyn draws a very natural inference from this fact that the air which is impure for the plants must be impure for human beings. Even if it be true that human nature can acclimatise itself to even unhealthy conditions, it is none the less true that this is only done at a certain sacrifice, and many can fully bear out Evelyn's statement that an absence from the metropolis is singularly conducive to increased appetite and spirits. What, he adds, "if there appear to be an arsenical vapour as well as sulphur breathing sometimes from this interperate use of sea-coal in great cities?" And here our author falls sadly upon "Newcastle Cole" and the injurious effects of the arsenical vapours of all subterranean fuel. As for the impurities connected with the use of coal, these appear to have been long known; and Evelyn refers to the "Blasphemy about Hoxtem prohibiting by law the use of coal for miles round, and the dyers and weavers of damask and other precious silks at Florence the least ingress of smoke to the looms." As for the view of the disinfecting value of smoke,—one which even to this day has its upholders,—our author very pertinently asks if the London smoke protected the metropolis from the attacks of the plague. "I do affirm," remarks Evelyn in another place, "that it is not the dust and ordure which is daily cast out of the houses, much less what is brought in by the feet of men and horses, or the want of more frequent and better conveyances, which renders the streets of London dirty even to a proverb, but chiefly this continual smoke which ascends in the day-time, and is by the descending dew and cold precipitated again at night," a fact which he notices from the dirt that may be seen on the lion, "the stinkiness of the water,"—one can scarcely imagine 200 years have passed since this natural complaint,—and the prodigious use of almond powder and soap." This his first part he concludes with the hope that he may succeed in pointing out to all "how pernicious this smoke is to our inhabitants of London, to decrie it, and to introduce some happy expedient whereby we may to the future hope to be freed from so intolerable an inconvenience."

In the proposal to rid the metropolis of "the clouds of smoke which so universally and so fatally infest the air and would in no city of Europe be permitted where man had either respect to health or ornament," and which, by its abatement, as we should say now, would bring a new life to London, and make it a new city, Evelyn's remedies resemble many made by later reformers; if the suggestion of the removal to the east end of all factories, is no novelty, that of "charking the culinary fires,"—using, that is (we presume), charcoal in our kitchens, as Evelyn had seen in France and as is there still done,—is one which has not been put forward, but which merits attention, for the belief in the unwholesome effects of charcoal is founded solely on its mismanagement. We have often heard it stated that our London smoke is met with by ships far out in the British Channel, but it is certainly curious to hear 200 years ago, of France complaining that our sea-coal injured their vines. That this injurious effect of the smoke of coal has long been amply recognised is proved in the quotation by Evelyn of a law of James I. prohibiting, in various counties of England, the use of certain obnoxious fuels, and Evelyn brings to his support many classic examples; the Israelitish sacrifices being burnt outside the camp; the prohibition among the Romans to bury or burn their dead within the city walls. It may be said that we have not yet realised this simple hygienic precaution, and Evelyn, 200 years ago, we find drawing attention to a dangerous practice not yet discontinued. Every one, too, must appreciate the fervent desire of old Evelyn, that the silver channel of the Thames may be kept pure. Evelyn, we see, was an early hygienic reformer; he was warm in his views, and the appeal he makes to all "that have houses in the city, you that bring up your wives and families from their sweet habitations in the country, that educate your children here, that have offices at Court, that study the laws," applies equally well to the present day. "Health and beauty are concerned in this petition, and it will become

ur wise senators, and we earnestly expect it, that they would consult as well the state of the natural as the political body of this great nation so considerable a part whereof are inhabitants of this august city, since without their mutual bearing and well-being there can nothing prosper or arrive to its desired perfection."

It is but what we might expect from the delightful and refined author of "Silva, or the Forest Trees," that one proposition for the remedy of the smoke-nuisance of London should consist in the suggestion to plant sweet-smelling shrubs and flowers in the open spaces about the City.\* It is not a little amusing that as early as this we find exception taken at the "exorbitant increase of tenements, poor and nasty cottages near the City," which our author urges, should be prohibited, as disgracing and taking off from "the sweetness and amenity of the environs of London."

The remedy suggested is not of a nature, we are afraid, practical enough for the present day; but the suggestion is none the less one that merits attention. We may, to great extent, counteract the noxious effects of smoke and impure air by the growth of greenery, and when once this fact is admitted more generally, perhaps London may be planted with trees like Paris. In the mean time our increasing number of chimneys will continue to befoul the London air, unless some steps be taken to check what is becoming yearly a greater infestation, and which, from the possibility of its prevention, or at least, its abatement, is only the more humiliating by its presence. Agitation only is necessary to rouse public action against what is no natural evil, but a purely self-inflicted torture. This point, 200 years ago, old Evelyn saw and endeavoured to show to his contemporaries, and yet, in 1832, can we say that we are nearer the solution of the problem than was this original Fellow of the Royal Society?

#### THE ACQUISITION OF OPEN SPACES IN LONDON.

It is satisfactory that there now exist some clear and definite rules for the preservation of open spaces within the area of the metropolis. The crude provision of the Metropolitan Open Spaces Act, 1877 (40 & 41 Vic., c. 35) are now supplemented by the Metropolitan Open Spaces Act, 1881 (44 & 45 Vic., c. 34), and the two combined may be said to form the code of rules which regulate the acquisition of a public open space in London. The Act of 1877 was, as we have said, comparatively a crude one, for it only enabled the Metropolitan Board of Works, by purchase on voluntary sale or by the gift of persons entitled to dispose of the ownership of an open space, to hold the same in trust for the perpetual use of the public. There was also a provision by which, where an open space was used as a place of recreation for the inhabitants of the surrounding houses, the owners or occupiers of such houses, that is of all the houses, might convey to the Board of Works as trustees for the public the right to enter and use such places on agreed terms. For the purpose of carrying out these objects the Board was empowered to defray any expenses caused by the fulfilment of the provisions of the Act.

So the law stood until last session, by which time it had become evident that however useful it might be as it was, yet it by no means was sufficiently wide in its operation. Every year the question of open spaces in the metropolis has been becoming more important, and therefore it was of no little moment that the law should facilitate the possession of such as exist by a public body, as perpetual "lungs" and places of recreation for the crowded inhabitants of London.

A brief review of the provisions of the Act of 1881 will show to what extent the law has been improved on this subject, and what are now its leading features.

When any open space within the metropolis is under the provisions of any private or local Act, placed under the care and management of trustees or any other representative body, they may convey it to the Metropolitan Board of Works, or to the vestry or district board of the

place where it is situated, and this conveyance may be either for a nominal or a substantial sum, and extend to any term of years or limited interest in such a space. But before any such conveyance as we have mentioned can take place, two things must have been done: the trustees must have passed a resolution to effectuate the conveyance, and the owners and occupiers of the houses which front on this open space must have given their consent. It is important, however, to notice that such a resolution is valid if it is passed by a majority of two-thirds of the persons present, and the same majority of occupiers and owners is required to give an effectual consent at a meeting called for this purpose. Therefore, it is pretty obvious that if there is any substantial reason against transferring an open space, it will not be done; but if only a small section of the inhabitants are adverse to a change, they will not be able to prevent the public from having the benefit of an open space, which it may be well that they should be able to use. There are, however, two provisions which seem unnecessary. The first, that no meeting for the purpose of effectuating a transfer shall be held between the 1st of August and the 31st of January; and the second, that when a resolution for a transfer has not been carried, it shall not be put again for three years. Both spaces of time seem to be too long, though, we presume, the first is meant as a protection to those who live in West-end squares which are little likely to be acquired by the public. The provisions which we have already noticed are applicable to cases where a single person is the owner of the space, and the dwellers in the neighbourhood have the right to use it.

The remaining provisions, exclusive of what may be termed minor details, are also important, since they enable disused burial-grounds and churchyards to be vested in the Metropolitan Board of Works or other local body, "with a view to the enjoyment by the public of such churchyards, &c., in an open condition free from building," but not for the purpose of games and sports. It is also satisfactory to see that the authorities are specially empowered to "drain, lay out, turf, plant, ornament, light, seat, and improve" those churchyards of which they obtain the management. The result, we hope, of this Act will be to make the old churchyards of London no longer an eyesore, and will enable the inhabitants of a neighbourhood to enjoy the open spaces, which are now too often monopolised by half a dozen individuals. It will also prevent any chance of any open space being built over, which it may be desirable to keep as a public recreation-ground; and we may further express a hope that similar provisions will shortly become law in regard to our large provincial towns. The graveyards of Liverpool, for example, are now a blemish to that fine city.

#### ASHBURNHAM HOUSE.

ASHBURNHAM HOUSE, Westminster Abbey, has recently attracted a considerable amount of public attention, chiefly from the fact of its having been, through some curious legal arrangement, transferred from its original possessors, the Dean and Chapter of Westminster, into the hands of the governing board of Westminster school,—a change which is, for many reasons, to be deplored.

There seems to be evidence of a fairly reliable kind that Ashburnham House is, for the most part, the work of Inigo Jones. The whole question has been ably argued in a letter by Mr. Alfred Marks, which we published last week (p. 27, ante). Portions of the building certainly exhibit some of this architect's peculiarities in a very marked manner, notably the staircase of which we give an illustration.

The house is situated upon a plot of ground between the south cloister walk of the Abbey and the yard of Westminster School, having entrances from both. As the principal entrance, however, is from the school, or south side, we shall speak of that as the front, and call the other the garden side, as it looks over an old-fashioned terrace-garden terminated by the high wall of the ancient refectory of the Abbey.

Ashburnham House consists of a centre pavilion and two wings, constructed of red brick, all very plain, and depending for its ornament upon the old brick architraves of the doorway and a simple band and cornice; the proportions, however, are decidedly pleasing, and before the centre pavilion was raised a story it must have

\* The names of those he gives as likely to prosper in the London atmosphere are—jessamine, myrtle, Gualder roses, mase, Spanish heath, bay, juniper, ligum vite, and lavender, "but, above all, rosemary," vines and hops, lime-trees; in the beds,—pinks, carnations, cloves, gilly-flowers, and primroses, arbutus, violets, cowslips, lilies, narcissus; thyme, mist, &c.; other plants reserved for beans, peas, and cabbage, as cutting they give off a bad smell, "but sweet-smelling and useful plants."

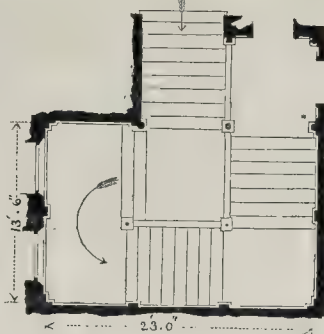


been a very characteristic example of the plainer style of domestic architecture of the seventeenth century.

All the principal apartments appear to have been originally upon the first floor, the ground-floor being used for kitchens and other offices. The most remarkable portion of the building is the main staircase leading from the entrance-hall to the first floor, the arrangement of which can be better understood by looking at the plan and engraving that we give than by any amount of description. The whole of the architectural detail is of wood, except the ceiling, and the joiner's work rather partakes of the Mediaeval manner of construction than the modern; thus wooden pegs are used where we should now use screws, and the work is, in general, cut more out of the solid than it would have been if executed at a later date. The great profusion of panelling and the variety of its treatment and forms seem also to bespeak a kind of recollection of late Gothic work, though the detail itself is quite that of the Renaissance. One feature also which is, we think, peculiar to Inigo Jones is here to be noticed: we refer to the marked entasis given to the Ionic pilasters. At Whitehall the pilasters have the entasis, though the best authorities on Classic architecture seem to be opposed to this treatment. It will also be noticed that no frieze or cornice intervenes between the great cavetto of the ceiling and the architrave of the colonnade, the cavetto itself serving as a part of the entablature. The most interesting portion of the design is the oval skylight or lantern, which is very elegantly treated, and serves to give an air of great dignity and importance to this moderately-sized staircase (it is in reality only 23 ft. square from wall to wall). The small landing at the top of the staircase leads, by means of two doorways, to the old dining-room, which is lighted from the garden side of the house, and contains a most charming recess or alcove for the sideboard, and to the ante-room or vestibule of the great drawing-room; the two latter are richly panelled, the architraves of the doors adorned with a good deal of carving in wood, and the ceilings are elaborate examples of plaster-work divided into large square and oval compartments. The extremely intelligent clerk of works of Westminster Abbey, Mr. Wright, informed us that the large oval compartment in the centre of the drawing-room had formerly a dome over it, which was probably destroyed when the top story of the house was added. There seems to be a great deal in favour of this view, as there can be no doubt that the timber-work over the ceiling at this point has been altered, and also the inner rim of the mouldings which surround the panels, is here wanting. Now, it does not seem likely that this feature would have been omitted in the most important panel of the whole ceiling, and if it had been removed at any time we should be sure to find some mark upon the flat plaster-work. The mantelpieces are good in design, though rather plainer than might be expected in such a house. There is nothing much of interest in the top story, except the little gallery surrounding the oval lantern of the staircase. The windows which light it retain the original wooden mullions and glazing, and the tile roof is very quaintly treated. These are additional evidences of the early date of the staircase, and are quite what one would expect to find in a house erected at the end of the reign of Charles I.

The ground-floor contains a large entrance-hall or vestibule; a kitchen, which retains an old arch that evidently belonged to the monastic buildings; the apartments upon this floor have, however, been refitted within the present century, and are uninteresting. We must not, however, omit to notice a fine old Perpendicular doorway, with its original doors of oak (unfortunately in a very bad condition), leading into a kind of cellar.

The little courtyard in front of the house is paved with stones of various colours, arranged in patterns, and in the garden in the rear of the house is a little summer-house or alcove, which is also considered to be the work of Inigo Jones.\* It bears a certain kind of resemblance to parts of York Gate, which is supposed to be the work of the same architect. The columns are constructed of brick covered with plaster, and although there is little to be said for such a mode of construction, it is not improbable that this is the earliest example of it at present existing in England.



As we have said before, we consider it a matter of regret that this building should have been allowed to pass out of the hands of the Dean and Chapter into those of the school authorities. We can scarcely credit a report which has reached us that the present possessors of this interesting mansion seriously contemplate pulling it down at no very distant date, and are convinced that public opinion would strongly condemn such an act. But apart from this, there are other considerations of a still more serious kind, which lead us to consider it in every way undesirable that Westminster School should make any further encroachments upon the precincts of the Abbey. By a very wise and judicious arrangement, the great boarding-schools of the metropolis are one by one being removed into the country or suburbs, and in no instance could the reasons for such a removal be advocated with greater force than in the case of Westminster; a more unsuitable site as a dwelling-place for a large number of youths could be scarcely conceived, surrounded as it is on all sides by the mouldering remains of humanity, which have been accumulating for more than a thousand years. Speaking from a sanitary point of view, what is the Abbey? A vast charnel-house. The cloisters are a crowded burial-ground; the very playground is a diseased cemetery; while within a stone's throw is the enormous churchyard of St. Margaret's. An immense hospital overlooks on one side, and a series of crowded alleys and narrow streets occupying the other (a trap for London fogs and stagnant air), render this one of the least healthy situations in the whole of London, and we cannot help feeling convinced that before many years are over, Westminster School must either return to the original intentions of its founders, and become a day-school pure and simple, without any boarding-houses attached to it, or be removed bodily into the country or suburbs. It is absurd, in view of those sanitary reforms elsewhere which have been forced by the growth and conditions of the metropolis, to allow our great boarding-schools to remain in the midst of over-populated and unsuitable districts.

#### ROUND ABOUT ALDERSGATE.

"ALDERSGATE, or Aldersgate, so-called not of Aldrich or of Elders,—that is to say, ancient men builders thereof; \* not of eldarne trees growing there more abundantly than in other places, as some have fabled; but for ye very antiquity of ye gate itself, as being one of ye first four gates of ye city, and serving for ye western parts as Aldgate for ye east; which two gates are for difference's sake, called ye one Baldegate and ye other Aldersgate." The Ealdgate, or Aldgate, of which Stow thus speaks, was built in the later Roman wall of London, as a way into the city from the east, upon the construction of the bridge at Stratford over the river Lea. The claims of this and of Aldersgate to antiquity are rivalled by Bishopsgate and Newgate. The foundation of Bishopsgate is ascribed to St. Erkenwald,† in the year 675 A.D. Newgate was built in the city wall during the reign of Valentinian, emperor of the West (364-375 A.D.) for an entrance by the new road leading from Tyburn,—along what are now Oxford-street, High-street and Broad-street, St.

Giles's, Holborn, Newgate-street, and Watling-street,—to the new bridge (London Bridge) across the Thames. The old road to the river turned southwards at the Marble Arch, going down Park-lane, and so, keeping to the west of the river Eye, or Aye, along the marshes of Thorney Island to the ford between Millbank and Westminster. At this time London was known by the complimentary title of *Augusta*; shortly afterwards the Roman forces were gradually withdrawn from Britain to resist perils that threatened nearer home.

The entry of King James I. from Scotland into London, through Aldersgate, was commemorated in the New Gate, which, in the year 1617, was built close to the site of the former, between Little Britain and Ball and Mouth (Boulogne Mouth) street. This new gate was designed by Gerard Christmas, who, Vertue alleges, was architect of Northampton House, Charing-cross, built for Henry Howard, Earl of Northampton, on the ruins of the Hospital of St. Mary, a cell to the Priory of Runneval, Navarre, and founded temp. Henry III. The house was subsequently called Northumberland House, on the marriage of a daughter of the Earl of Northumberland with the Earl of Suffolk, to whom the house was left by his kinsman, Henry Howard.

Christmas's Gate presented the customary features of a central archway flanked by two square projecting towers. Over the roadway, facing to the north, up Aldersgate-street, which began here, was set up an equestrian figure, in high relief, of King James I. At the sides were inscribed two appropriate verses of Scripture—"And Samuel said unto all Israel, behold, I have hearkened unto your voice in all that ye said unto me, and have made a king over you" (1 Sam. xii. 1); and "Then shall there enter into the gates of this city kings and princes sitting upon the throne of David, riding in chariots and on horses, they, and their princes, the men of Judah, and the inhabitants of Jerusalem; and this city shall remain for ever" (Jeremiah xvii. 25). On the inner front appeared the king's effigy seated in a chair of state. John Day, the printer, had a lodging in the gate-house (just as Cave, many generations after him, lived over St. John's Gate, Clerkenwell). Here, in the year 1594, he printed his folio Bible, dedicated to King Edward VI.; with Latimer's "Sermons," the "Works of Roger Ascham," and Foxe's "Book of Martyres." The New Gate was once adorned with the heads and limbs of the regicides. Damaged by the Great Fire of 1666 it was sold by auction on the 22nd day of April, 1761, for 911., and was shortly afterwards pulled down.

Stow enumerated six churches of his time in Aldersgate Ward. Four of these that had been burnt in the fire were not rebuilt. These were St. John Zachary, an ancient foundation in Maiden-lane, Wood-street; St. Mary, Staining; St. Olave, Silver-street; and St. Leonard, Foster-lane. Of the other two, that of St. Anne and St. Agnes was also burnt, whilst St. Botolph's escaped. St. John Zachary is now united with St. Anne and St. Agnes; St. Olave with St. Alban, Wood-street; and St. Leonard with Christchurch, Newgate-street. The church of St. Anne and St. Agnes was formerly called St. Anne-in-the-Willows, but why so, Stow says he does not know, though he conjectures it may have taken its name from the multitude of willow-trees that grew in this locality. The church was burnt down in the year 1548, and soon afterwards rebuilt. In 1680 the present edifice was built by Sir Christopher Wren, at a cost of 2,448l. 0s. 10d. St. Botolph's was replaced with the present church in the year 1790, at an expense of about 10,000l. Its churchyard was thrown open in October, 1880, as a public recreation-ground. The southern boundary forms an interesting relic of the old London wall; but it is so embedded and lost in later superstructures and additions as to be well nigh indistinguishable. This is one of the four churches at the City gates which are dedicated to the popular St. Botolph. The story runs that, travelling with his brother Atolph into Gaul, he met there two sisters of Ethelmund, king of the East Saxons, who recommended him to their brother. Ethelmund gave him a piece of land in Lincolnshire,—a forsaken uninhabited desert, where nothing but devils and goblins were thought to dwell; but St. Botolph, with ye virtue and sygne of ye holy crosse, freed it from ye possession of those hellish inhabitants, and by ye means and help of Ethelmund built a monastery therein." Boston (Botolph's-town) is said to mark the site of this Benedictine monastery,

\* See Mr. Marks's letter (p. 27, ante).

\* The name appears as Aldrichgate in the London Chronicle, temp. Edward IV.  
† Fourth Bishop of London.



where Botolph, its first abbot, died in the year 680 A.D.

In Howell's "Londinopolis," 1657, it is stated that "Ye street resembleth an Italian street more than any other in London, by reason of ye spaciousness and uniformity of ye buildings and straightness thereof, with ye convenient distance of the houses; on both sides whereof there are divers fair ones." Aldersgate-street has been greatly modernised in past years, and but twenty-four months ago was despoiled of one of its few remaining ornaments, in the shape of the Half-Moon Tavern. The destruction of so unique a specimen of Elizabethan domestic architecture is much to be deplored. Its latest occupant, on what grounds is best known to himself, had placarded it as being "Shakespeare's House." Such it never was; but it was a favourite resort of Ben Jonson and the wife of his own and succeeding generations. A fine drawing of the house is included in the Crace collection, now in the Kensington Museum. But the chiefest glory of this street (and also doomed to speedy demolition) is Thanet, more commonly known as Shaftesbury House. This stands on the eastern side, and will readily be identified by its handsome elevation, with eight pilasters, the work of Inigo Jones. He built it for the Tuftons, Earls of Thanet, who are now represented by Richard, first Lord Hotfield. From the Tuftons it passed into the hands of Sir Anthony Ashley Cooper, bart. Sir Anthony was the great-grandson of Richard Cooper, owner of the mansion of Paulet, which he purchased in the twenty-second year of King Henry VIII., of Sir Amyas Paulet, the same Sir Amyas who built the former Middle Temple gate, as a fine to Cardinal Wolsey. Sir Anthony Cooper, born on July 22nd, 1621, was actively engaged during the civil wars. Espousing first the one cause, and then the other, he finally contributed to the restoration of the monarchy, and for this service was created Baron Ashley of Wimborne St. Giles, county Dorset, in April, 1661. The following year he was elevated to the Peerage as Earl of Shaftesbury, and in November, 1692, was declared Lord High Chancellor. To him the country is indebted for the Habeas Corpus Act, and the judges' independence of the Crown. Lord Shaftesbury's political reputation, however, is best remembered in the fine lines of Dryden:—

"For close designs and crooked councils fit";

and the stanzas in "Hudibras," beginning,—

"'Mong these there was a politician,  
With more heads than a beast in vision."

He married three times, but left only one surviving son, by his second wife, Frances, daughter of David Cecil, Earl of Exeter. A strong opponent of the subsequent measures of the Court, he was compelled to emigrate to Holland, dying there, of gout in the stomach, on the 22nd day of January, 1683. About twenty-five years after his death, the house reverted, in 1708, to the Tuftons. In 1720 it became an inn, in 1734 a tavern, in 1750 it was converted into the London Lying-In Hospital, and in 1848 into a dispensary. Its present aspect will be seen in my sketch (fig. 1). The town mansion of another famous member of the "Cabal,"—John Maitland, second Earl and first (and only) Duke of Lauderdale, stood in this street. Some would identify it with the fine red brick mansion near Lauderdale Buildings; others say it stood at the top of Hare-court, where, in later years, was built the well-known meeting-house,—premises now converted, by the superposition of a third and fourth floor, into a printer's establishment. At the back of this, again, may be seen a set of old-fashioned little houses, which will well repay a visit. Beyond Lauderdale House, and on the "Lauderdale Estate," was the Bell Inn, two or three doors from the Barbican, "of a pretty good resort for wagons with meal." Hence, on the 14th day of July, 1618, John Taylor, the Water Poet, started upon his "Pomonaesque Pilgrimage" to Scotland; following, by a few days only, in the footsteps of Ben Jonson. It is a mistake to ascribe Jonson's tour solely to his desire to visit his fellow poet and fellow countryman, William Drummond. But he did go to Hawthornden; and one morning in January, 1619, Drummond, waiting under the yewmower which yet stands before the house he had himself built, saw the burly form of his guest approaching on the road leading from Lasswade. "Welcome, welcome, royal Ben," to which the latter replied, "Thank ye, thank ye, Hawthornden"; and they went in and fraternised. Drummond, in his *Noctes Camague*, "has preserved to us," in Professor

Masson's words, "such morsels of Ben's talk as are worth pages of our dry literary histories of that period"; but though he stayed for three weeks in the house of one who was an ardent admirer of Shakespeare, some of whose then rare works were on the shelves of the room in which they would sit together, it happens by the unluckiest of chances that nothing but a fragment passed about the poet, and that to the effect, said Jonson, that "Shakespeare wanted art," in his play of the "Winter's Tale." In his "Carriers Cosmographie," Taylor names four inns in Aldersgate-street,—the Peacock, Bell, Three Horse Shoes, and Cook. Westmoreland Buildings marks the site of the town residence of the Nevilles, Earls of Westmoreland, whose line now rests in the Marquess of Abergavenny. Trinity-court, hard by, perpetrated the fraternity of the Holy Trinity, founded in 1377 as a brotherhood of the Saints Fabian and Sebastian. Licensed by King Henry VI., they were suppressed in the reign of King Edward VI. The hall was standing as late as the year 1790: a view of it will be found in Brayley's "Londiniana," 1829. Henry Pierrepont, Marquess of Dorchester, lived in Peterborough House, which once stood opposite to Thanet House. Converted by Cromwell into a prison, it subsequently became the town residence of the Bishops of London, their other home in St. Paul's Churchyard having been destroyed in the Fire. Here the Princess Anne found refuge when, deserting her father, King James II., in 1688, she fled hither, escorted to the house by Bishop Compton in a hackney coach. A few steps further on is a group of three or four very picturesque old houses, with square bays. Amongst others whose memory gives an exceptional interest to this district, I may mention Mary, daughter of Sir Henry Sydney, K.G., and wife of Henry Herbert, second Earl of Pembroke, to whom Sydney dedicated his "Arcadia." She died, of a green old age, at her house in Aldersgate-street, on the 25th day of September, 1621; but lives in the inscription by Ben Jonson, on her tomb at Salisbury Cathedral,—the six lines which begin:—

"Underneath this humble hearse,  
Lies the subject of all verse."

Also Brian Walton, bishop of Chester, editor of the Polyglot Bible, who died here in 1661; Harry Percy, the "Hotspur" of Shakespeare; and Mordaunt, Earl of Peterborough.

LITTLE BRITAIN takes its name from the mansion of John, Duke of Bretagne and Earl of Richmond, temp. Edward II. A charming description of its houses and their occupants is given in Washington Irving's "Sketch Book"; but his words must be taken as extending to the neighbouring precincts of Bartholomew Close and Cloth Fair. Little Britain formed the centre of the bookselling trade in the time of the Stuarts. Richardson the elder recounts, upon the information of Dr. Isaac Robinson, that Lord Buckhurst (whom he erroneously styles Earl of Dorset, a title to which he did not succeed until many years afterwards), hunting about here for books in the company of Mr. Fleetwood Shephard, lighted upon an epic poem, in ten books, which greatly took his fancy. The dealer begged he would speak favourably of the work, if he liked it, for the copies lay on his hands as waste paper. Lord Buckhurst sent the volume to Dryden, who returned it with answer, "This man cuts us all out, and the ancients too." The poem in question was "Paradise Lost," which just two years before this Milton, by a contract, dated the 27th day of April, 1667, had sold to Simmons, the printer, for an immediate sum of 5*l.*, with a further sum of the same amount payable upon the sale of the first thirteen hundred impressions. The receipt for the latter payment bears date the 26th day of April, 1669. The work was clearly not "waste paper" when Lord Buckhurst is said to have seen it for the first time, and Dryden was then, and had been for some while, acquainted with Milton. On these, and on other grounds, Malone conclusively rejects the authenticity of the story; just as he dismisses the apocryphal account of Sir John Denham entering the House one day with a sheet of "Paradise Lost" wet from the press, and exclaiming,— "Part of the noblest poem that ever was printed in any language or in any age." Even supposing a proof-sheet to have fallen into Denham's hands, he was then not only disordered in his understanding, but not a Member of Parliament.

From his lodgings in the house of one Russell, a tailor, at St. Bride's, a house of which the site is now occupied by the *Punch* office in Fleet-

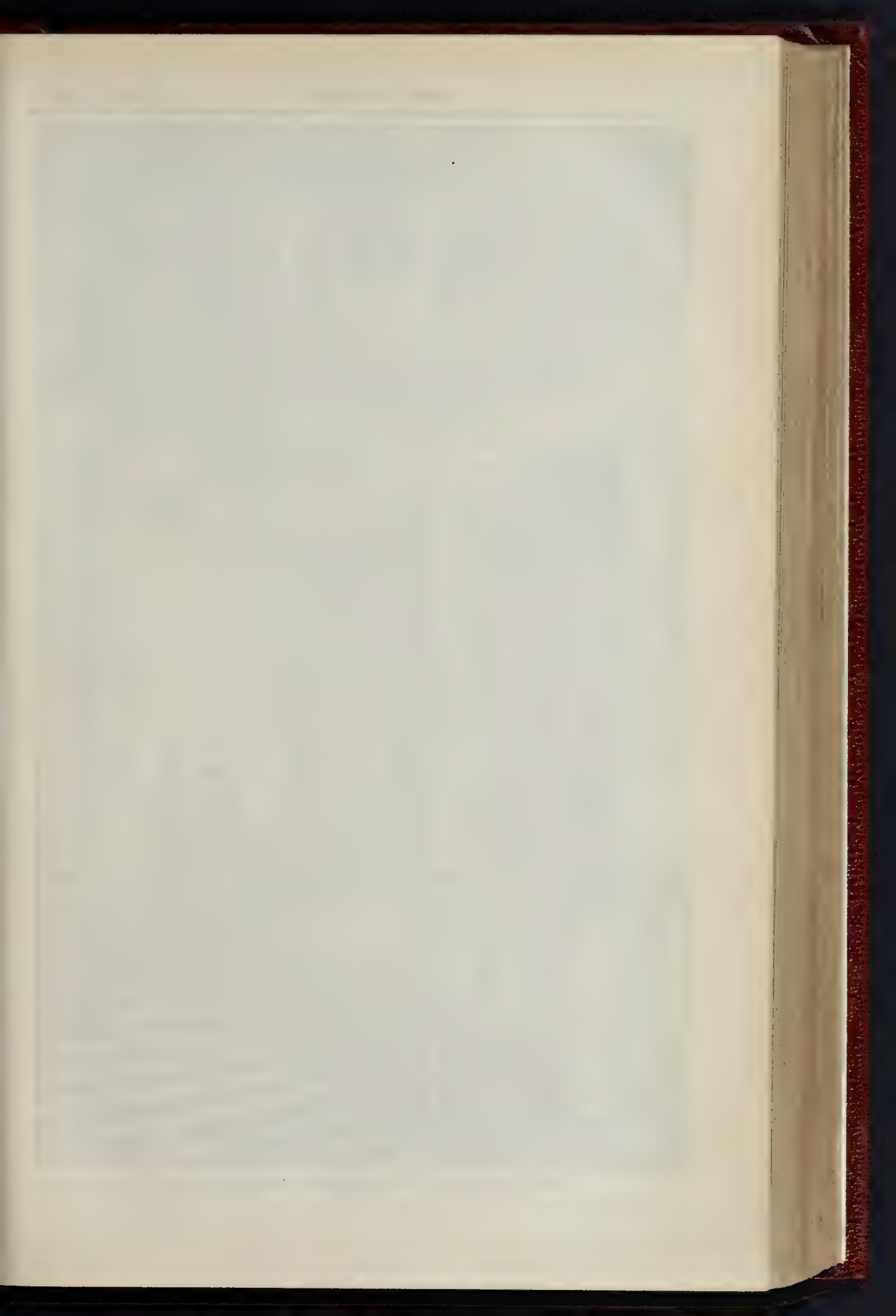
street, and whither he had conducted his young rovelist wife, Mary Powell, Milton removed to Aldersgate-street. In his "Life of Milton," 1694, Phillips says:—"He made no long stay in St. Bride's Churchyard; necessity of having a place to dispose his books in, and other goods fit for the furnishing of a good handsome house, hastening him to take one; and accordingly a pretty garden-house he took in Aldersgate-street, at the end of an entry, and therefore the fitter for his turn, by the reason of the privacy, beside that there are few streets in London more free from noise than that." There were many of these "garden-houses," that is to say, houses situated in gardens, upon the then outskirts of the City, especially in the northern suburbs. The term is a technical one, and frequently occurs in Wood's "Athen." and "Fast Oxon." Milton's house in Jewin-street, a turning out of Aldersgate-street, to which, in the year 1661, he subsequently removed (after a brief sojourn in Holborn, near Red Lion-fields), was also a garden-house, as were, indeed, most of his dwellings after his first marriage and settlement in London. The corner-house of my sketch (fig. 2) is said, but on no very trustworthy authority, to be the one in Cloth Fair, where he lay concealed at the Restoration, until his pardon was obtained; though, as Dr. Johnson observes, he does not seem to have been very diligently pursued. That house adjoins the now churchyard of St. Bartholomew's the Great. At the outbreak of the Plague, in the year 1665, his third wife, Elizabeth Minshull, having died in the previous year, Milton left his house, in Jewin-street, and went to the cottage provided for him at Chalfont St. Giles, by Ellwood, the Quaker, who, on the 26th day of August, 1662, had been seized whilst preaching at the Bull and Mouth Inn, and thrown into Newgate. Returning to London in 1666, Milton took a house in Artillery-walk, Bunhill-fields, and there he died on the 8th day of November, 1674. "I cannot but remark," says Dr. Johnson, "a kind of respect, perhaps unconsciously, paid to this great man by his biographers: every house in which he resided is historically mentioned as if it were an injury to neglect naming any place that he honoured by his presence." These no longer exist; the last to remain was that in Petty France, Westminster (No. 19, York-street), inscribed by Benham, "Sacred to Milton, Prince of Poets," and inhabited by Hazlitt. This was destroyed a few years ago. The Lacedæmonians, and the hero of Macedonia after them, spared Pindar's house in Thebes; but the Apollon of modern improvement, as mighty a conqueror as Alexander, though without his magnanimity, leaves us no one of the many homes whereof one could say, "Here lived Milton!"

CLOTH FAIR, a narrow street with many curious corners and covered passages, stands to the north of Bartholomew-close. It is so named as being associated with the resort of the clothiers of England and the drapers of London, together with the French and Flemish merchants, to the churchyard of the Priory of St. Bartholomew the Great, when the time-honoured fair was celebrated every Bartholomew-tide. Here may still be found many characteristic survivals of Tudor London. One of these is shown in my view (fig. 3), of the "Stings" public house. Bartholomew Fair was established in Smithfield, or Smoothfield, by Rahere, jester to King Henry I., and founder of the neighbouring priory and hospital. Stow says he was "a pleasant witty gentleman, and therefore in his time called the king's minstrel." But that he was something more than this is amply testified by a MS. (too long for quotation here) written soon after his death by one of the resident monks. The writing is in the Cottonian MS. "Vespasian," B. ix. In the year 1544, King Henry VIII., in consideration of a sum of 1,064*l.* 11*s.* 3*d.*, granted the property of the dissolved priory to Sir Richard Rich, the net income of the priory at the dissolution of the year 1539 was, according to Dugdale's *Vestiarii Monumenta*, 693*l.* 0*s.* 10*d.* Sir Richard Rich, whom Queen Elizabeth created Lord Rich, was progenitor of the Earls of Holland and Warwick, a line that expired with the decease, in the year 1759, of Edward Henry, seventh Earl.

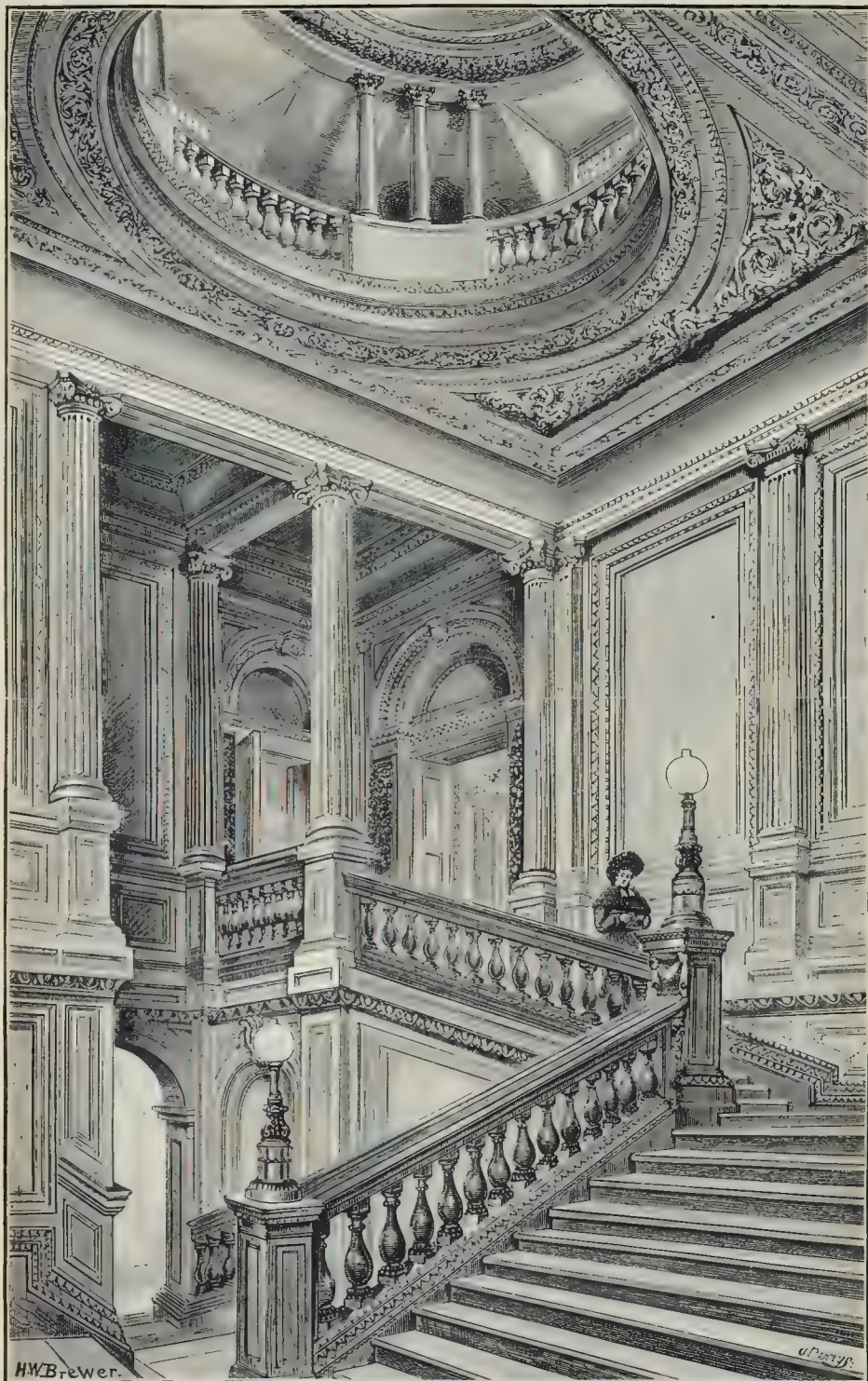
W. E. MILLIKEN, B.A.

Finchley and Muswell-hill Coffee Tavern Company, Limited.—The competition has been decided in favour of Mr. J. Treadway Hanson. It was a limited competition, to which five architects were invited.





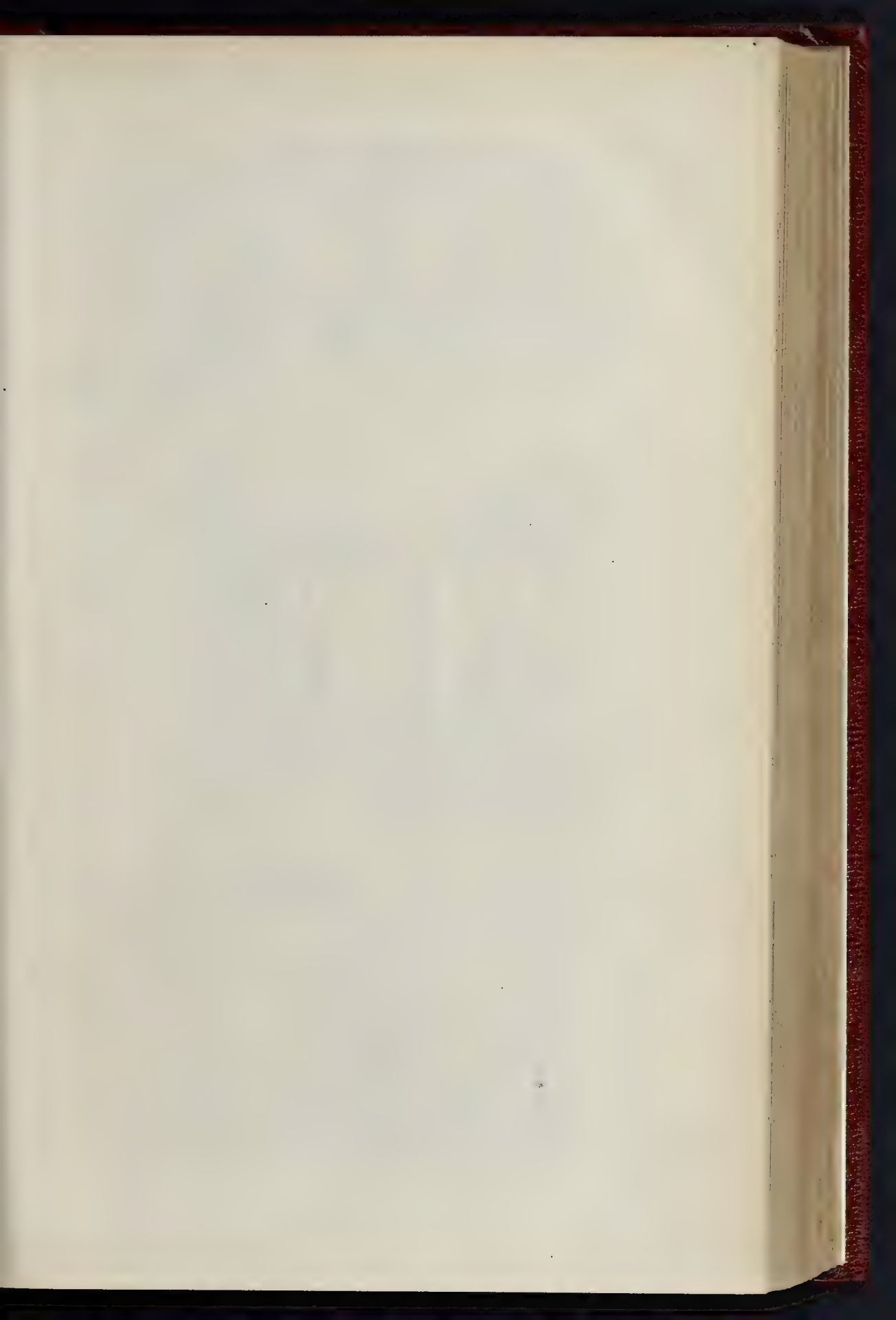




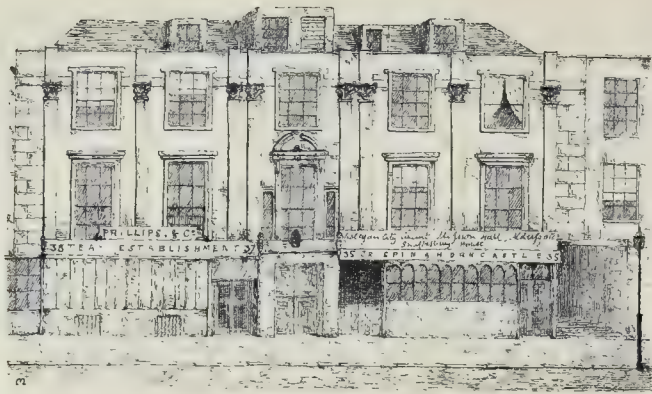
ASHBURNHAM HOUSE: THE STAIRCASE.—Attributed to Inigo Jones.

[See p. 38, ante.]

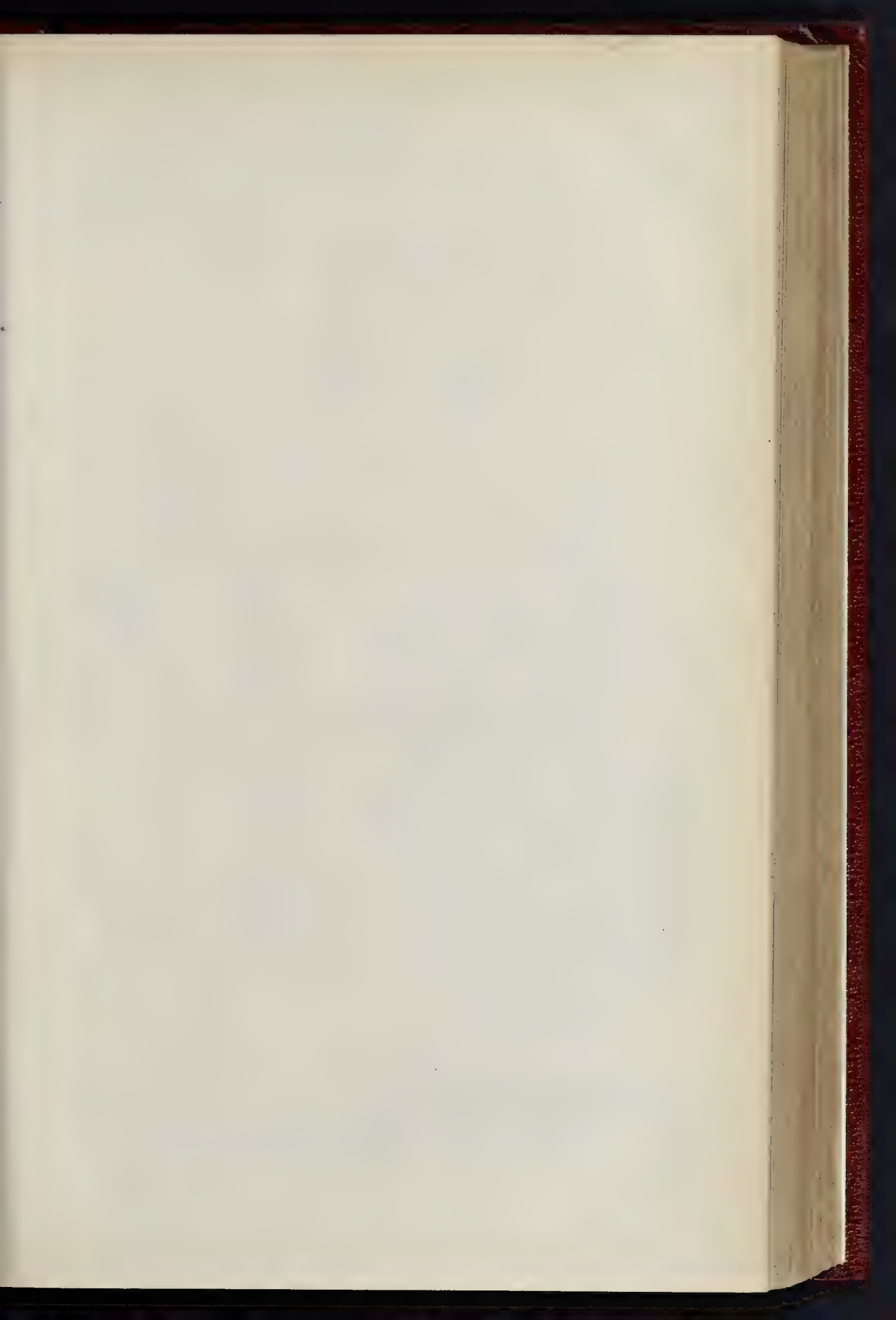


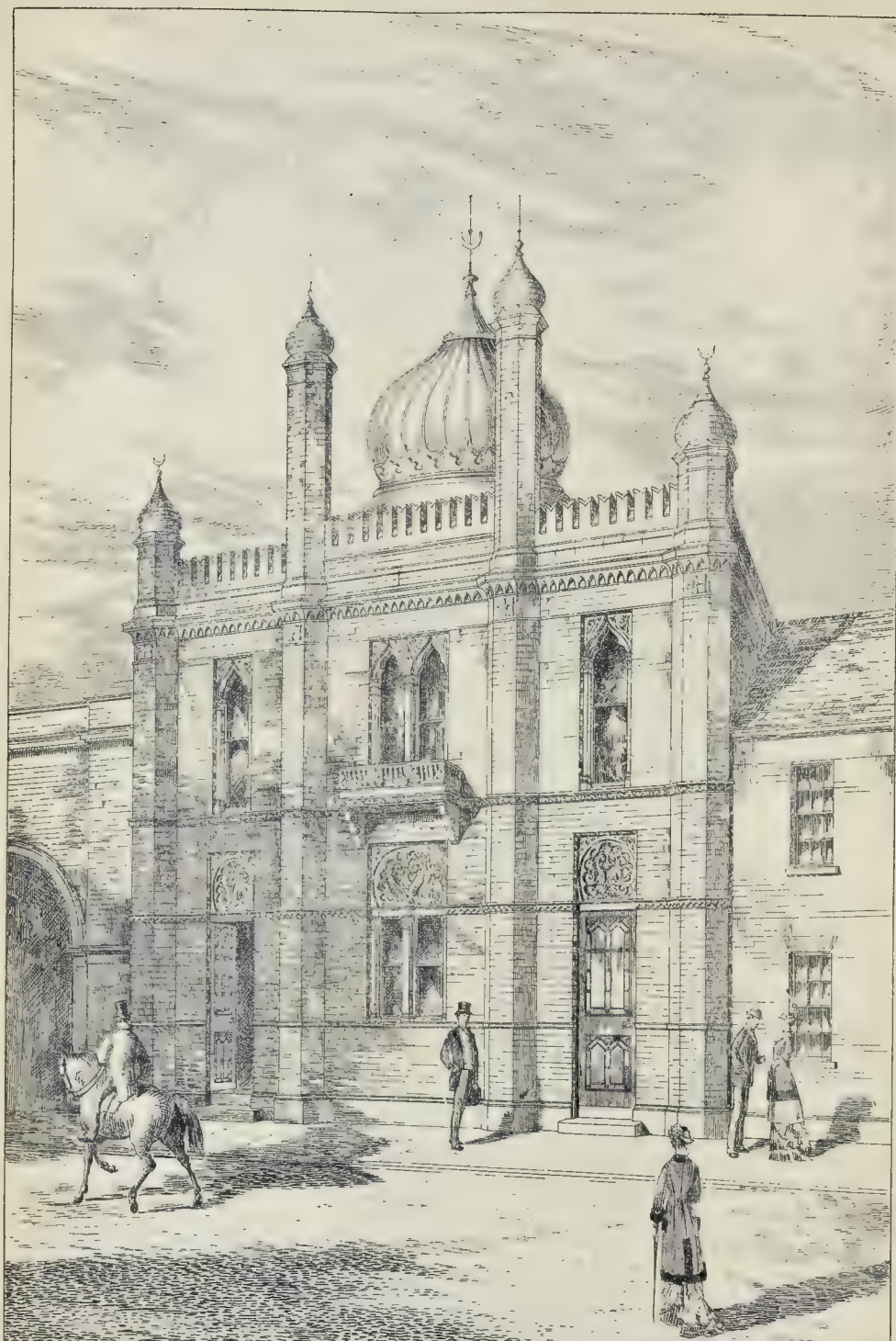










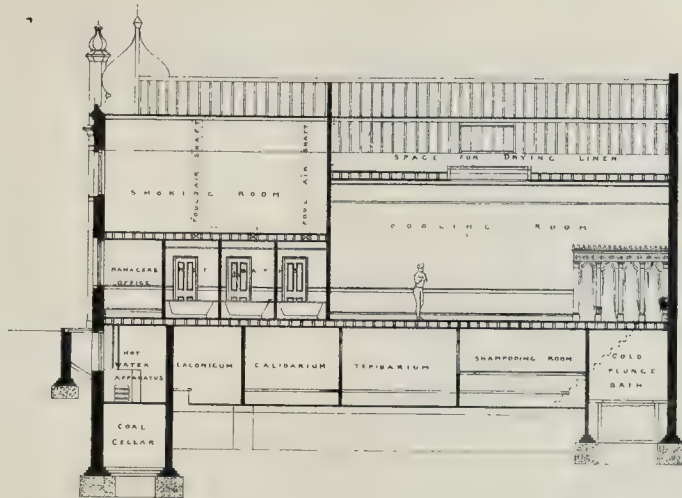


DALSTON JUNCTION TURKISH BATHS. J. HATCHARD SMITH, ARCH<sup>T</sup>

Photo Lith<sup>d</sup> by P. F. Redd, Castle St. Holborn, E.

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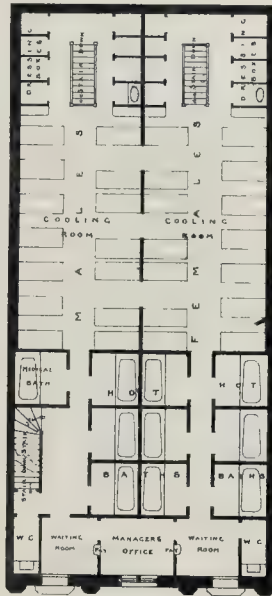




LONGITUDINAL SECTION.



BASEMENT PLAN



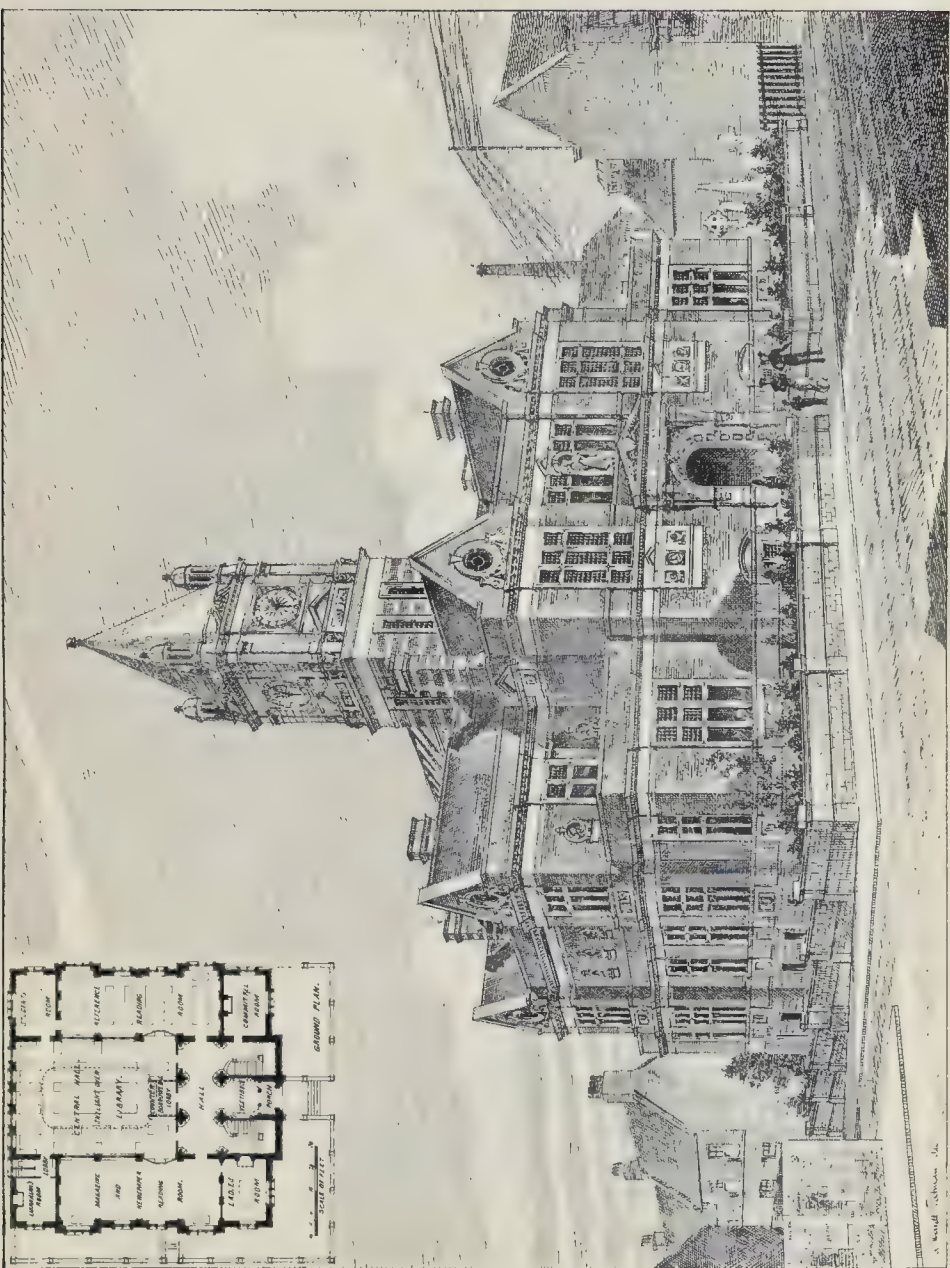
GROUND PLAN.

10 20 30 40 FEET.

# DALSTON JUNCTION TURKISH BATHS





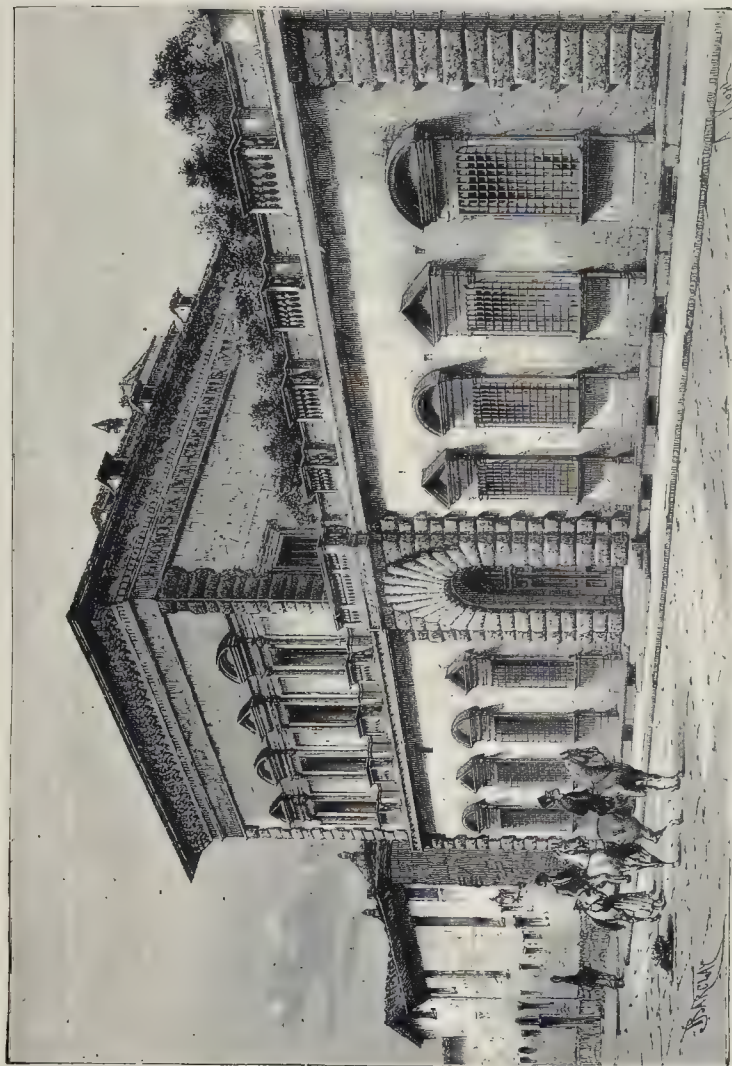


W. & A. G. & S. P. H. & S.

DESIGN SUBMITTED FOR THE FREE LIBRARY AND MUSEUM AT OLDHAM: BY MR. A. H. TILMAN AND MR. H. SHAW, ARCHITECTS.







THE PANDOLFINI PALACE, FLORENCE.—DESIGNED BY RAFFAELE.

[See p. 33, ante.]





## THE DALSTON JUNCTION TURKISH BATHS.

We publish this week the plans, sections, and front elevation of the above baths, the works at which are nearly completed. It is hoped that the drawings will prove sufficiently explanatory; therefore it will be only necessary to describe the general features.

On entering the vestibule, which is lined with marble tesserae, the bather passes through to the large cooling-room, 32 ft. by 32 ft. by 16 ft. high, lighted by two ceiling-lights. The room is divided by a partition having openings in it, which can be closed by movable doors, in order to allow one side of the building being used for private Turkish baths or for ladies three days a week. The bather undresses in one of the small chambers which he will find on either side, and then descends a short flight of stairs to the first hot room, which is heated to about 100°, a temperature which the most delicate person will regard as simply delightful when the body is not hampered with clothing. In the next room, called the "Tepidarium," the temperature is higher (about 120°), and so on through the other rooms till a temperature of 230° is reached. The bather can recline either on the settees, or on the marble slabs which surround the various rooms. When he has been in the hot rooms for about half an hour,—or, in fact, whenever he wishes it,—he passes into the shampooing-room, where, lying on a marble slab, the flesh is carefully rubbed and then washed with a fibre-brush, and he is at once passed on to the shower-bath, which is regulated to any temperature; or, if preferred, to the cold plunge-bath. At the further end of this he is received by an attendant, who conducts him to a couch in the cooling-room. The bather can either stay there and have refreshments or ascend to the smoking-room, which is situated on the mezzanine floor.

The baths are supplied with hot water from two tanks, one for each side. The boiler and hot-air apparatus are in the basement.

The building is faced with red Suffolk bricks: the arches are of yellow Malms; the cornices, caps, cupola, &c., are of cement.

The decoration of the cooling-rooms will be left till the spring, in order that the plastering may get perfectly dry. The hot baths are lined with blue tiles, and the hot rooms have painted dados, and the walls above are coloured.

The works have been carried out by Mr. J. Holland, builder, of Poplar, and the engineer's work is by Messrs. Tylor & Sons, under the superintendence of Mr. J. Hatchard Smith, architect, of Moorgate Station-buildings, E.C.

## A DESIGN FOR FREE LIBRARY AND MUSEUM, OLDHAM.

The view and plan we have given illustrate the design for proposed Museum and Free Library, submitted by Mr. A. Hassell Tiltman, No. 7, John-street, Bedford-row, and Mr. Henry Shaw, 52, New Broad-street, architects, jointly. The materials proposed to be used were red bricks, with terra-cotta dressings, and the estimated cost of the work was 8,800l.

## REPORT OF THE LIGHTNING-ROD CONFERENCE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary business meeting of this Institute, held (open only to members) on Monday evening last,

The Chairman (Prof. T. Hayter Lewis, Vice-President), after other business, said,—I have to bring to your notice the Report of the Lightning-rod Conference. The subject of injury to persons and property by lightning has forced itself upon the attention of scientific men for some time, more especially in France. It was forced upon Frenchmen by the extraordinary number of accidents. The returns there have been taken for nineteen years, and more accurately than we do, because they take the accidents which are not fatal as well as those that are, and in these nineteen years no fewer than 6,714 persons were struck by lightning, and 2,238 killed. We cannot wonder, then, that the subject has attracted great attention. The subject was taken up here by the Meteorological Society two years back, and they sent out invitations to different societies, and, amongst others, to our own, asking that delegates should be sent to a Conference to be held, which

was to go thoroughly into the matter. Six societies responded and sent delegates. The Meteorological Society sent Mr. Brooke, who unfortunately died very soon after he was nominated. He was elected chairman, but occupied that position only a short time. Mr. Dymond, as a vice-president of the Meteorological Society, attended nearly every meeting, and Mr. Symonds, who was its president. The Society of Telegraph Engineers sent Mr. Latimer Clark and Mr. Preece, the Electrician to the Post Office, both gentlemen having likewise been its presidents; the Physical Society sent Professor Adams, a colleague of Professor Kerr at King's College, and Professor Carey Foster, a colleague of my own at University College. In addition to these, there were Professor Ayrton and Professor Hughes, both first-rate authorities in electrical matters; and lastly, you did us the honour of sending Mr. Whitchord and myself to represent you. For secretary we had Mr. Symonds, who brought the whole chaos of materials into order, classified them properly, and at last drew up a skeleton report which was adopted pretty nearly as he suggested. The first thing we did was to send round circulars to the different manufacturers to know what their practice had been. The Institute sent a circular to its members, asking them to send in particulars of any accidents known to them occasioned by lightning, and stating the circumstances in tabular form. We had thirty-six replies, which form part of the Appendix. Then particulars of other accidents of various kinds for a number of years were collected by Mr. Symonds, and we had a very good basis of facts to start upon. As a large amount of information was scattered in different reports from scientific societies,—more especially in reports made to the Academy of Sciences in Paris,—these reports were analysed and abstracted. Then we had likewise the opinion of foreign authorities as to the best mode of protecting buildings. Finally we had some reports that were made, giving the information at Paris up to the present time according to the best authorities. A couple of pages have been added, giving information to architects which will form the basis of specification for any building in which you want conductors fitted up in the best possible manner,—in fact, giving a regular specification from which anyone may draw out his orders so that you may not be at the mercy of contractors.

More than that, there was a paper drawn up, giving directions for personal safety, by Professor Carey Foster, and another drawn up by another member of the Commission, showing how, in the ordinary construction of a house, and using the ordinary material without any special apparatus, you could use the gutters, the water-pipes, &c., so as to produce a certain amount of protection, though not perfect protection. As far as Mr. Whitchord and myself went, our knowledge of electricity was not sufficient to enable us to take a very leading part in the matter, but anything we said was listened to with great attention and carefully considered, and we were able to point out work which would not have come under the notice of a person not thoroughly acquainted with building construction. The report has been signed by the whole of the members. I am told that it is looked upon as a very valuable contribution indeed to electrical science. As far as we are concerned personally as architects, I think we are very much indebted to the members of the Conference for the extreme care and attention they have bestowed.

Professor Kerr.—I have the pleasure to move, "That this Institute acknowledge with its best thanks the great success of the Committee's labours and the value of their Report." I have had the satisfaction of looking through the volume, and I must say that a more elaborate and exhaustive discussion of the subject could scarcely be supposed possible. Our distinguished friend, Mr. Symonds, will tell us more about it presently; but to me, as being not an electrician, but only an architect, it seems to be very successful indeed. Gentlemen may perhaps wish to know in half a dozen words what is the conclusion arrived at with regard to the effect of a lightning-rod applied to a building. It is this,—that by carrying down from the summit of a lightning-rod a line at an angle of 45 degrees with the horizon, and causing that line to revolve round the vertical axis so as to form an imaginary cone, the point of the lightning rod which is the apex of that cone is said to protect all that lies within the cone. Why that should be so I am obliged to say I am totally at a loss to see. I

should like if Mr. Symonds would give us some idea of the reason. It seems to me that the imaginary cone ought to be turned upside down and made to proceed upwards from the point of the lightning-rod, because then such a cone, or, for instance, the intersection of several of such cones proceeding from several such points, would seem to direct one's attention to the attraction of the electric spark from the upper air (as the region from which comes the influence against which the building is to be protected); whereas, I cannot see how a cone proceeding downwards from the point should have any reason for protecting all that is within its circuit. That is the only point which attracted my notice as requiring explanation. The rules which are given in the volume for the mechanical part of the disposition, arrangement, and construction of lightning-conductors are very elaborately discussed, and no architect can fail to inform himself from that volume of all that he really requires to know. I, therefore, have very great pleasure in moving the resolution which I have the honour to lay on the table.

Mr. John Honeyman, of Glasgow, said,—I have great pleasure in rising to second the motion. I think that our chairman has given a very modest sketch of the united labours of the Conference in preparing this admirable report. It is impossible to look through it without being struck very forcibly by the tremendous amount of labour and time which must have been expended in its preparation. We, I am sure, are deeply indebted to the Conference for the result of their labours. I notice, amongst other things, that the report itself is a model of conciseness and comprehensiveness. Indeed, the volume may be considered a compendious handbook, not only for direction in the construction of lightning-conductors, but for any amount of research in regard to the scientific questions involved. There is still room left to the architect, undoubtedly, after all has been said and done, for the exercise of his judgment to a large extent, and of his taste in the application of these conductors; but the great point gained is that we absolutely know what is necessary, and on the very highest authority. I have no doubt that this volume will be of immense interest and use, not only in Great Britain, but throughout the world, because, of course, in a matter of this sort, what is good for us is good for anyone anywhere, and this, I am sure, will be the highest reward the members of the Conference can have for their labours. One result of the perusal of this book has been to make me somewhat covetous of something more being done in the same direction. There are, for example, such questions as dry-rot, decay in stone, &c., where the combined conference of distinguished scientific men would be of immense advantage, and it would be a cause for our additional thankfulness to the present Conference if it should lead to the Institute inaugurating some such investigations.

Mr. G. J. Symonds, F.R.S. (President of the Meteorological Society).—I feel some hesitation in rising, because I know very well the services that have been rendered by those members of your own body whom you selected to represent you, and that thanks are due rather to them than to myself. Mr. Honeyman, in his remarks, called attention to the quiet and modest way in which Professor Lewis spoke of the work of the committee, but even he did not know, as I do, how enormously we are indebted to Professor Lewis himself for the assistance he has given. If Mr. Honeyman had looked into the index he would have been astonished at the number of abstracts which have been contributed by Professor Lewis, and in saying so I do not ignore the valuable assistance of Mr. Whitchord. I am only speaking the sentiments of the members of the Conference if I say that we feel much indebted to the Royal Institute of British Architects for the excellent choice they made. We are also indebted to them for the circular which they issued to their brother members, and for the responses obtained. They formed the practical element in the Conference; the Telegraph Engineers and the Physical Society the electrical element; and the Meteorological Society—well, I don't know what element they supplied, except, perhaps, the digestive. There was one point which I regret, and for which I cannot account, and that was the singularly small number of manufacturers who responded to our circular. We sent to ask them what they were doing, and what rules they were following, but my impression is that we did not have answers from more than one in a dozen



We had valuable replies from about ten manufacturers, but a very large proportion said nothing. Possibly the reason is that many of them are working by rule of thumb, without very much knowledge, and hence were afraid to commit themselves to pen and paper. One or two of those who did reply have committed themselves very considerably with respect to the bibliography. I do not suppose any one was more astonished than I was at the number of books that had been written about lightning-conductors. The list of publications in that report includes 704 works, but many of them are a reiteration one of another, without apparently involving very much beyond copying what had gone before. A remark was made as to our report being of some use abroad. Perhaps it is a little bit of vanity to say so, but I have already had three or four letters from most distinguished electricians on the Continent, expressing their extreme satisfaction with the work, and this must be gratifying to those who assisted in compiling it. With respect to the area of protection I cannot without the black-board make myself thoroughly clear. The main idea to be kept in mind in considering damage by lightning is that of a fluid. I think you will get all the best rules for the formation of conductors if you will imagine a sort of atmosphere denser than our own, or, if you like to call it so, "an ocean," which has the power of being attracted and drawn up just as the tides in the ocean are drawn up by the moon. I must, to be clear, go back to first principles. A flash of lightning is simply the discharge of two opposite electricities, the one in the clouds, the other in the earth. If you have a rod of metal reaching from the earth to the cloud, the lightning would pass down that, and there could be no discharge. If, on the other hand, you have merely a brick chimney, then the lightning, finding a bad conductor, breaks that, and so you have damage done. Take the chimney away altogether, and what happens? The electricity in the earth may be imagined to be drawn up just as the electricity in the clouds is drawn downwards, and they will break across each other at a certain point, and then there will be the lightning flash and a destructive discharge. Now the rule of the angle of  $45^\circ$  is not based upon an electrical theory at all, but upon actual experience. M. Duprez, of Belgium, and others, have for several years investigated the cases in which buildings, already provided with adequate conductors, have been struck, and the question is—How near to the conductor may a building be struck? Take a church with a single steeple at one end, and a long nave, and perhaps a little transept. If you have a conductor on the steeple it by no means necessarily protects the chancel. It all depends upon the height of the steeple, and there are many cases in which a church with a good conductor on the steeple has been struck on the chancel or transept. That shows that there is a point beyond which the super-elevation will not afford protection, and a large number of measurements, which have been taken of the horizontal and vertical distance from the conductor, give us only two, and those doubtful, cases of injury within a radius of  $45^\circ$ . These are the facts upon which the rule is based. You will find the whole thing rather fully worked out in the report. Mr. Freese read a paper before the British Association at Swansea, in which he went carefully into the subject from a purely electrical point of view, and he got a curved value, his curved value giving an area of protection rather less than ours. His curve runs down the steeple rather closely, and does not go off at an angle of  $45^\circ$ , but spreads out at the base. Practically the two things are nearly the same. The area protected, generally speaking, is of a radius equal to the height. I have to thank you for the way in which you have received our efforts.

The hon. secretary having put the motion, it was carried by acclamation.

Concerning the question of Architectural Competitions, it was resolved that the report presented by the Special Committee appointed to consider the subject be printed, with other cognate papers, in the "Journal of Proceedings," to be issued on Thursday, the 26th inst.

**Birkenhead Town-hall Competition.**—We have received copy of a correspondence on this subject, showing dissatisfaction on the part of architects with vagueness of conditions, but it reached us too late to be considered.

#### ARCHITECTURAL ASSOCIATION.

At the ordinary general meeting of this Association on the 6th inst., Mr. Aston Webb, President, in the chair, the following gentlemen were elected members, viz.:—Messrs. Jas. Mitchell, J. H. Morgan, P. M. Johnston, G. T. Poole, J. Bathurst, W. E. Fewick, D. Powell, H. A. Whitburn, W. R. Mack, W. J. Cook, C. J. Bradley, W. A. Webb, L. R. Ford, H. R. Goodrham, W. D. Gravell, A. A. Field, F. W. Pickering, W. F. Young, A. Howell, H. Field, S. S. Markham, J. W. Hughes, F. L. Hooper, F. Simpson, and J. G. Sankey.

The President said it was always a pleasant duty to notice the successes of the members of the Association. This year, the Gold Medal for Architecture at the Royal Academy had fallen, as usual, to a member of the Association (Mr. J. Howard Ince). The second medal of the Academy, for measured drawings, had also been gained by a member of the Association (Mr. T. C. Yates). The Chairman also said that the announcement which had been made of the appointment of their esteemed member, Mr. Hugh Stannus, to be the teacher of modelling in the Architectural School of the Academy, would give them all great satisfaction.

Mr. Ewan Christian was announced to give an address on "Specifications," but having unfortunately (as we are sorry to hear) injured his knee, he was unable to be present. Under these circumstances, Mr. R. C. Page, who had intended merely to move a vote of condolence with the family of the late Mr. Street, R.A., somewhat extended the remarks with which he would have prefaced that proposition had Mr. Christian been present, and read the following brief sketch:—

THE LATE G. E. STREET, R.A.

Since last we met in this room our profession has, as you all know, sustained a great and irreparable loss in the death of George Edmund Street. Our President has asked me to say a few words to-night, and to move a vote of condolence with Mr. Arthur Street. I am sure there is not a man in this room but will agree in the propriety of such a step; for in a society like ours, the energy and enthusiasm of a great architect must always be appreciated, and, therefore, it is fitting and right that when such a one passes away, we shall place on record our appreciation of his powers, and our regret at the loss to our profession. I wish that an able man than I had been chosen to address you to-night, but as I had the inestimable advantage of working in Mr. Street's office for some years, and as I am not altogether unknown in the Association, I regard the task suggested to me as a duty I owe both to Mr. Street's memory and to the Association, and therefore I felt but little hesitation in according to our President's request, as it seemed to me more fitting that what we have to say this evening should be an expression of the feeling of the Association, and as such should come from Association men, and not from those outside our ranks better qualified to speak, and who doubtless, had they been invited, would have attended this evening.

I began my remarks by describing our loss as irreparable, and in no conventional sense have I used the term; for, believe me, as such I regard it. Although, fortunately for our profession, there are many men left to us of distinguished ability, I venture to state, without fear of contradiction, that Mr. Street's death has left a void in the ranks of our profession which it is quite impossible to fill. Whether regarded as an artist, a man of business, or a man of the world, he was, indeed, remarkable; and although doubtless there are many architects possessing those advantages separately (though even then I am fain to believe they possess them in a lesser degree), I am not aware of the existence of a man in whose person they are combined as they were in the person of George Edmund Street. It was impossible to be in Mr. Street's society without feeling that one was in the presence of a man of mark—a man amongst men; his appearance and manner impressed one at once, and seemed to stamp him as a man far above his fellows. So great a loss have we sustained in the death of Mr. Street, that I am almost disposed to regard it as a professional calamity, occurring at a time like the present, when architectural taste is in such a state of hopeless confusion. The present is not a time when we can afford to lose a recognised leader of an archi-

teetural school of thought, and that Mr. Street's death will affect the progress of the Gothic cause I, for one, have no doubt. To our finite understandings it seems very hard that a man such as he whose loss we deplore should be taken from the scene of his labours at the very height of his success, his popularity undiminished, his artistic powers showing no sign of decadence, and last, but not least, with a new career before him in the cause of art as President of the Institute. From his appointment to the chair of the Institute much was to be hoped for, and, indeed, his influence had already made itself felt, his opening address receiving far more attention from the daily press than is usually accorded to architectural utterances. The "leading journal" thought fit to give an account of the opening meeting and a leader on the subject of Mr. Street's address. I fear we must regard this action of the press in this matter as due rather to the professional position of Mr. Street than to a newly-awakened interest of the public in architectural questions. As an artist, Mr. Street, as is well known to you all, possessed wonderful ability; but on this subject I think it would be presumptuous for me to speak. I may, however, say in passing that it always seemed to me Mr. Street was at his best when dealing with a small subject such as a village church, or a group of buildings such as the Convent at East Grinstead. The simple beauty of the detail, the picturesque grouping of the parts at East Grinstead, mark the work as coming from the hand of an artist, and the design of the building is, it seems to me, such as to rank it with the best buildings of Medieval times. To those who knew Mr. Street's method of working it never occasioned much surprise that his smaller buildings were more successful than the larger ones, as a design was almost invariably treated in sections or parts, and each detail seemed to be regarded as a separate work rather than as a portion of the entire scheme. To a man of lesser ability this method of procedure would be impossible, and with such a large practice as Mr. Street had, any other mode of work would have precluded him from giving the personal attention which he very justly thought his clients had a right to expect. I have no intention of giving a list of his works; those of you who wish for information on this point should consult the professional journals; nor do I, for the reason already stated, propose to discuss the relative merit of Mr. Street's designs, confining myself with the mention of the design for the Convent at East Grinstead, which has always been, and, I believe, always will be, to me, at least, a work of beauty.

As a worker, Mr. Street was simply indefatigable, and the rapidity with which he worked, and the number of drawings he made, have always occasioned surprise; indeed, when I have mentioned the matter to any of my brother professionals, the information I have given has invariably been received with an air of incredulity,—quite excusable when, as is no doubt the case, such a man as Street is judged by other men's standards. In his work he never spared himself, and rarely spared any one else; he was actuated by a stern sense of duty, and in all his dealings was entirely honourable and just, and as he behaved towards others, so did he expect others to behave towards him. His power of detail was remarkable; many of his mouldings will compare favourably with ancient examples; not only were they beautiful in themselves, but in many instances Mr. Street drew the mouldings he desired without the necessity of any alteration, and it was by no means uncommon for him to carry on a conversation at the same time as he was preparing details. In many instances designs for buildings which seemed somewhat below Mr. Street's standard have been redeemed by the beautiful detail which he put into his work as it progressed, and that, too, without appearing to alter the original design. All the work undertaken by Mr. Street was sound in construction, and of enduring character; and I recollect his once telling me, "Remember always that we build for all time," this, indeed, seemed to be the idea he ever had before him. As we all know, difficulties in carrying out a building must and will arise, and few men could more readily devise a way out of an awkward situation than Mr. Street; so clever was he in this respect, that what with a less able man would have been a blemish in the design, became with him a positive merit. Whatever he undertook he did thoroughly, and every building he was called upon to carry out bore the impress of his own



ability and genius. It was this thorough devotion to his art which was his chief characteristic, and few can read his Academy lectures without realising that the talented author really felt and meant what he said; and, further, that what he most desired was not mere popularity for himself, but that others should feel and act as he did. On reading these powerful addresses one feels inspired with fresh energy and enthusiasm, such as one experienced when the glory and beauty of Gothic architecture came as a revelation in the youthful days of one's student-ship.

As a man of business, Mr. Street was shrewd and clear-headed, and always expressed his views distinctly and decidedly. He possessed the power of saying the right thing at the right time, and invariably made his points tell. He had the courage of his opinions, and did what he believed to be right and just regardless of consequences. As I knew him late in life, so I believe him to have been all along, a man to whom success came, leaving him as it found him, pursuing the path of duty, not spilt by the accident of the circumstances in which he found himself. Such, gentlemen, is a brief sketch of the late George Edmund Street, a man who, all through his career, brought honour to the profession he loved so dearly, and who now rests from his labours within the walls of the glorious Abbey of Westminster, beside a multitude of noble and great men whom the world has elected to honour, and, in his case, the honour conferred on him is reflected on the profession he so long adorned.

Much could be written with regard to Mr. Street, and doubtless one or another of his contemporaries will undertake the task of writing a memoir. I have simply endeavoured to express my view of Mr. Street as I knew him, and my knowledge is necessarily limited both by time and opportunity. It now simply remains for me to propose the vote of condolence, which is as follows:—

"The members of the Architectural Association have heard with inexpressible regret of the death of George Edmund Street, R.A., and desire to convey to Mr. Arthur Street their sincere sympathy in his bereavement, as well as their condolence with him in the irreparable loss which he has sustained."

Mr. L. C. Riddett said that, as one of the Vice-presidents of the Association, he had been asked to second the vote of condolence, which he did with profoundly melancholy feelings. His personal acquaintance with Mr. Street was of the slightest, but, during business intercourse with him on one occasion not long ago, he had been struck by the marvellously clear way in which he had grasped a situation which was one of extreme difficulty. Mr. Street would be remembered amongst other things for his opening address as President of the Institute, and the burden of that address would, he trusted, continue to ring in the ears of the public. Mr. Street's bold advocacy, in that address, of good building-work in the houses of the people must produce fruit. The time must come when architects as a body would have to protest as they had never yet protested, and to take decided action, against the bad vernacular buildings of the present day. Mr. Street's loud protest against it, from his position as President of the Institute, was a very satisfactory sign. In the same address Mr. Street had referred to the future of the Association in terms which, though giving rise to some difference of opinion, were dictated by his kindness of heart and by his appreciation of the work of the Association.

Mr. Arthur B. Pite, as a student who felt that he owed much to Mr. Street's teaching, supported the vote of condolence. It seemed to him that the great lesson to be learned from Mr. Street's career as an architect was constancy of purpose. He endeavoured earnestly to find the truth, and finding it early, with a steadfastness and determination beyond all praise he never swerved from it, either to the right or to the left.

Professor Kerr, who was called upon by the chairman to speak, said he had come down to the meeting in the expectation of hearing his friend Mr. Christian discourse upon an important practical subject, and, therefore, he was not at all prepared to say anything on the sad subject of Mr. Pate's address. His (the Professor's) individual tastes had never been in any degree in accord with those of Mr. Street, but at the same time he had always esteemed him personally, and had supported him whenever occasion offered for anything being done by

him to the advantage of the profession. It was not at present easy to grasp the precise position which Street occupied, or, rather, it was easy to overlook it. In order to know what had been doing in the Gothic revival within the last twenty years by its most conspicuous leaders, it was necessary to contemplate the characters of Sir Gilbert Scott, Mr. Burgess, and Mr. Street. While Pugin might be called the John the Baptist of the Revival, these three men were its apostles. There were great differences in the characters of the three. Sir Gilbert Scott was a very great man,—a much greater man than some people supposed. He was a man essentially for the public of this country, and was a man of compromise. He struggled very hard to discover what was the principle he was expected to stand by, but he was not, like Street or Burgess, possessed by an intuitive determination to do one thing, and nothing else. He was perhaps the most popular architect of the nineteenth century. He was most amiable in his disposition, upright, friendly, and generous in his dealings and altogether a man of very refined character. But he was essentially a man of compromise. Burgess and Street, on the other hand, were not men of compromise, but were the resolute and determined foes of compromise. It might be thought that Burgess was tending towards compromise when, during the last year or two of his life, he began to speak favourably of Greek architecture. But in that there was no tendency to compromise. Burgess, who was instinctively an artist, began to see that there were two sides to the question, and he showed that he was capable of looking at the question from its opposite side. Street was, on the other hand, so resolutely bent on the pursuit of one object that he had no time to consider the other side. Burgess was a man of very refined and elegant tastes, and his designs, though masculine, were withal elegant. The elegance which characterised them was not present in Street's work in the same degree. Street was the representative of absolute unswerving masculinity and muscularity. If anybody had said to him that a tower, for instance, designed by him was ugly, his answer would have been something like this: "I don't care if it is, if it is true to its purpose. If it indicates my intention, if it is architecture, sound and good, you may call it 'ugly' if you please." The loss of Mr. Street at the present moment would prove to be, he thought, a great blow to the Gothic revival. Considered as an artist, his loss was very great, but that could be repaired. There were several architects, men of sincerity, fixedly attached to the same end which he had in view, who would take his place so far as related to the movement which he represented, but the supreme leadership which had devolved upon him since the death of Scott and Burgess would not, he thought, be taken up by any one of his friends or successors. As a dispassionate spectator he should be sorry to see any weakness accrue to the Gothic camp because of Mr. Street's death, because he thought that Medieval architecture had still a career before it in this country, especially for ecclesiastical work, and he did not think that the whole of the excellences of the style had yet been revived.

Mr. J. P. Seddon said that Mr. Street was a personal friend of his, and one for whom he had the greatest regard. In the course of his remarks, he incidentally observed that we have not in this country a good translation of M. Viollet-le-Duc's "Dictionnaire." [This remark provoked the suggestion, by a subsequent speaker, that the work of worthily translating the profession as a memorial to Mr. Street.]

Mr. Cole A. Adams, and one or two other gentlemen, supported the vote of condolence, Mr. Adams giving it as his decided conviction that Street's detail would compare with anything that had been done, ancient or modern.

The vote of condolence having been passed, the meeting terminated.

**The Collected Compositions of H. R. H. the Prince Consort**—We are glad to hear that Messrs. Metzler & Co., of Great Marlborough-street, are, by command of Her Majesty, preparing for publication a complete collection of the Musical Compositions, Sacred and Secular, of H.R.H. Prince Consort, the whole being produced under the able supervision of Mr. W. G. Cousins, Her Majesty's "Master of Musicks."

#### MAINTENANCE OF MAIN ROADS THROUGHOUT THE COUNTRY.

MR. GEORGE BURT, of Grosvenor-road, has addressed a letter to the President of the Board of Trade on this important matter. Mr. Burt says that having great faith in the system pursued by the late Sir James Macadam of making and maintaining roads with proper materials and in first-class condition, he would recommend that a similar system be adopted with regard to the main roads throughout the country. He continues,—“As an essential element to this being carried out, I am of opinion that all the main arteries of traffic should be distinguished as ‘county roads,’ and be under the control of one Board and one practical road surveyor,—not a civil engineer or architect only,—for each county; and that the Secretary of State, or some other person, should have the necessary power, from time to time, to declare a road a county road or vice versa. The main sewage through these roads, as well as county bridges, should also be under the control of the same Board.” Mr. Burt is of opinion that if the roads were made of suitable material, and once got into a proper condition, they could be efficiently maintained at a cost of something like 50 per cent. less than is entailed by the present piecemeal and extravagant mode of maintaining them.

#### THE “NEW ROAD” AND PAVING QUESTION.

DECISION AGAINST THE HACKNEY DISTRICT BOARD OF WORKS.

MR. BARSTOW has given an important decision at the Clerkenwell Police-court in the case of Messrs. G. Searle, T. Young, and W. A. Snee, who were summoned at the instance of the Hackney District Board of Works, for payment of the sums of 54*l.* 5*s.* 11*d.*, 52*l.* 7*s.* 4*d.*, and 44*l.* 8*s.* 10*d.* respectively, being the apportioned paving rate in respect to Woodberry Down, where they resided.

Mr. Richard Ellis, the clerk, appeared on behalf of the Board. The defendants were represented by Mr. Poland, instructed by Mr. Ricketts.

Mr. Ellis, in opening the case, stated that the question at issue was one which had caused a great amount of litigation under the Metropolis Local Management Acts and the Amendment Act. The Board in 1869, under the powers vested in them by sec. 105 of the first, and sec. 77 of the second Act, formed and completed the road in question, the expense of which was apportioned to the inhabitants, but it was not paved in consequence of their desire that it should remain in a gravelled state in order to present a suburban appearance. Since that time the traffic had increased, and the Board in June last considered it necessary that the paths should be paved, and the present proceedings were to recover the amounts apportioned to the owners in consequence.

Mr. F. S. Farey, deputy clerk, produced the minute-book containing the resolution of the Board on the 22nd of April, 1869, which was to the effect that the road be formed and completed at an estimated gross cost of 804*l.* 18*s.* 6*d.* to be apportioned by two instalments, the first of which was to be levied as soon as the work was commenced, but the second was not to be called in till it had been executed to the satisfaction of the Surveyor.

Witness then produced the minute-book containing the resolution of the 22nd of June, 1881, directing that the footpaths should be asphalted.

Mr. J. Lovegrove, the surveyor to the Board, stated that upon the resolution of the 22nd of April, 1869, being passed, the first instalment of the apportioned amounts were levied upon the owners. The Board had decided at that time to pave the footpaths 4 ft. 6 in. wide, but at the wish of the owners the road was left in a gravelled state. Since that time the Board had kept the road in thorough repair.

Mr. Poland contended that the Board, under the powers vested in them by the Acts already referred to, exercised their right in 1869, and at that time formed and completed the road in question, levying the apportioned expense upon the several owners chargeable. This having been done, their right ceased, and the road remained entirely in their power. He cited in support of this, the case of Regina v. Hackney District Board of Works, in which it was held that, having once levied, they were bound for



the future to keep the road in thorough repair, and were not exonerated from any expense arising therefrom. It seemed to him that the Board had entirely forgotten what they did in 1869, and having regard to the action taken by them at that time, his clients were not liable in any further amount. Under section 106 the road could not be considered a new one, and he asked that the summons might be dismissed, with costs.

Mr. Barstow thought the road was not a new one, within the meaning of the Act, and the resolution of the 22nd April, 1869, relieved the owners of any further responsibility. He dismissed the summons, and allowed ten guineas costs.

Mr. Ellis asked for an appeal summons with respect to the question of the new road; but Mr. Barstow declined to grant it.

#### LYCEUM THEATRE.

The general scheme of decoration adopted in the entrance-hall, vestibule, and grand staircases of the Lyceum, just now reopened, is eclectic, its character being, however, based chiefly on Eastern designs and tints. The general tone of colour is rich red and gold, relieved by greenish blue, deep gold being used in the ornamentation of the former, and green-gold in that of the latter. The designs for the fretwork and stencilling are chiefly Arabian and Persian. The grand staircase, now nearly 20 ft. wide, opens between two massive gold candelabra which stand upon high plinths of majolica. The stairs are covered with a rich velvet pile Axminster carpet, of ruby colour, with a wide border of amber and black. At the top of the staircase, where it enters the vestibule, is a handsome silk plush *portière* of old gold colour stamped with a broad band, and hanging in curiously-rich folds. The same scheme of colour which governs the decoration of the hall is carried into the vestibule. The balustrade, which runs round the balcony in the vestibule, is of malachite, with pillars of gold, behind which rises a wall of greenery, palms, and foliage plants of all kinds. The doors leading from the vestibule to the circle, are of silk plush, to match the *portière* of the grand stair, and studded with gold nails in an Eastern pattern. The vestibule is lighted by Moorish candelabra, gaseliers, and swinging oil-lanterns, all of which have ruby glasses. The passages and stairs are lighted by the swinging lamps in addition to usual gas appliances. The decorative work has been designed and carried out by Messrs. Campbell, Smith, & Campbell, of Southampton-row, and deserves praise.

The revived "Two Roses," with which Mr. Irving opened, is admirably well played, and fills the house nightly.

#### DARWEN.

THE new schools for St. James's parish were formally opened on the 31st ult. The buildings are in the Gothic style, and one story high, and have been designed by Mr. W. Perry, architect, of Market-street, Darwen, and Lord-street-chambers, Southport. Provision is made for a mixed school, 60 ft. by 42 ft.; infants' room, 36 ft. by 28 ft.; two class-rooms, each 16 ft. by 11 ft. 6 in.; one, 22 ft. by 20 ft. 6 in.; another, 22 ft. by 14 ft. 8 in.; and cloak-rooms and porches. There is one large cellar, 36 ft. by 27 ft., utilised for sundry purposes, and also for the heating apparatus. The cloak-rooms are in close proximity to the main entrance to the school, and side entrances to the playgrounds, so that they may be utilised by the scholars without in any way affecting the order of the school. All the rooms open directly into the main school. The total cost of the buildings has been about 2,000l., and the following are the names of the local contractors who have carried out the work in a satisfactory and substantial manner:—Mason and joiners' work, Messrs. Lloyd & Millward; plastering, Mr. R. Watson; plumbing and glazing, Mr. J. S. Briggs; slating, Mr. Miles Eccles.

**The Balloon Society.**—This society, which takes a wider range than its name suggests, holds its meetings at the Royal Aquarium. On this Friday evening, January 13th, a lecture on the Elements of Art, will be delivered by Mr. Joseph A. Stark, architect.

#### CLERKS OF AUCTIONEERS AND SURVEYORS.

THE Lord Mayor presided, on the 7th, at a preliminary meeting of the members and representatives of a large number of firms of surveyors, auctioneers, estate and house agents, at the Auction Mart, Tokenhouse-yard, when the question of the formation of a benevolent fund for the benefit of the clerks of auctioneers and surveyors was brought under their consideration. At a subsequent public meeting, largely attended by both principals and clerks, Mr. Daniel Watney presided, and said, that as treasurer of the Auctioneers' Benevolent Fund he knew that there were numerous applicants for its benefits; but notwithstanding that many of the cases were very distressing, they could not be relieved because the applicants not having been in practice did not come within the rules of the fund. Therefore, he and others felt the necessity of a society or fund for the benefit of the excluded class being formed. He thought that a benefit fund for the clerks of surveyors and auctioneers was much needed. It ought, he thought, if formed, to be under the entire control and management of the clerks themselves, although for himself and other heads of large firms he could say that they would give such a deserving movement every encouragement and support, and help, as far as they could, those who desired to help themselves. On the motion of the chairman, supported by Mr. Galsworthy, the following resolution was carried unanimously:—

"That it is desirable to establish a provident society, to be called the Benevolent Fund for Clerks of Surveyors, Auctioneers, Estate, and House Agents."

A committee was afterwards elected.

#### LIGHTING BUILDINGS.

SIR,—In reply to "Electricity" in the *Builder* of the 31st ult., I may tell him that if the gas-pipe is perpendicular to the plane of the screen the surface at the centre of the latter will receive the greatest illumination when the light is placed at a distance of 14.14 ft. from the wall. This distance is easily found by multiplying the given distance of the gas-pipe from the centre of the screen by  $\sqrt{2}$ , that is by  $\cdot 707$  nearly. The following investigation will show how this rule is arrived at. Let (r) be the distance of the light from the wall, and let (a) be the distance of the gas-pipe from the centre of the screen, also denote the angle under which the rays of light meet the surface by Q. Now, the degree of illumination varies as the square of the distance (r) inversely when Q is constant, and directly as the sine of Q when (r) is constant. But  $r^2 = a^2 + x^2$ , and  $\sin Q = \frac{a}{r} = \frac{a}{\sqrt{a^2 + x^2}}$ .

Hence by the theory of variation the intensity of illumination varies, as  $\frac{a}{(a^2 + x^2)^{\frac{3}{2}}}$  when r and Q

are both variable quantities. Therefore, when the illumination is greatest the value of the latter function must be a maximum; or taking the logarithm the value of  $\log. a - \frac{3}{2} \log. (a^2 + x^2)$  must be a maximum. Denoting this last function by u, and differentiating, we have

$$\frac{du}{dx} = \frac{1}{a} - \frac{3x}{a^2 + x^2} = \frac{a^2 - 2x^2}{a(a^2 + x^2)}$$

Equating the last expression to zero, we find  $x = a\sqrt{\frac{1}{2}}$ . Thus, as x passes through this value  $\frac{du}{dx}$  passes through +0— and the value of the function is then a maximum.

J. G. VINE, F.R.A.S.

#### ALBISSIMA PAINT.

SOME strong testimonials to the goodness and usefulness of the Albissima paint from men whose names have weight have reached us, and these are capped by the fact that it obtained the silver medal at the late Brighton Sanitary and Domestic Exhibition, Mr. Grace, of Wigmore-street, and Mr. R. W. Edis, F.S.A., being the judges in the class to which it belonged. The fact that it is absolutely non-poisonous commends it to us, and those who have used it claim that its covering power considerably exceeds that of the best white-lead, and works with ease under the brush.

#### LEISURE FOR THE WORKING CLASSES.

ONE of the shrewdest and pleasantest of modern writers, Arthur Helps, used to say that the great end of work was to obtain leisure, but this was going a great deal too far. Work in itself is a useful and even a grand thing. There is no honest vocation in which we may be engaged that is not good for other reasons than that it earns the maintenance of the worker, which again is a more important matter than the earning of more or less leisure for him. But without subscribing fully to Mr. Helps's assertion, there is no doubt that the worker is the better for having leisure to look forward to, that the hope of a little leisure every day sweetens the day's work; that the prospect of a longer holiday, as in the case, say, of our English lawyers, enables them to do an enormous amount of work during term time; and the thoughts of the freedom and leisure, after a fortune is made, keep business men working steadily and cheerfully year after year till the wished-for competency is realised.

With some workers there is very little, if any, time allowed for leisure. There is no one amongst them for an idle man to be idle with; and though perhaps for a week or so a visitor may find sufficient amusement with them in London, especially during the present season, there soon comes a time when he longs for his ordinary work. The distribution of leisure, like that of wealth, is not so unequal in a new country as in an old one; and it is to be noticed that, while many of our workpeople who have emigrated to one or another of our colonies, speak in their letters home of having shorter hours of labour, more holidays, and higher wages than when in England, they remark also on the fact of it being difficult, in the land they have selected at their future home, to point to ten idle men not superannuated, or to find as many women as completely absorbed from domestic cares and duties as those of the Upper Ten Thousand are in the country from which they sprang. The girls of the well-to-do classes, however, when they leave school are apt to find time rather heavy on their hands, unless their mothers are wise enough to organise sufficient employment for them, or unless they have some tastes strong enough to become pursuits. We have seen clever girls turn with disgust from crochet and crewel work, morning calls, lawn tennis, and evening parties, as being too useless for the whole occupation of a rational human being, and who from their hearts envy their brothers who go into offices or into business, who earn their leisure and prize it. In America, they say there is no leisure; but that refers exclusively to the men,—the womankind belonging to the rich business men have leisure enough and to spare.

In France, as well as in this country, for those with time and money at command, there are organised various forms of amusement, exercise, and dissipation for morning, noon, and night,—sport in every varied form,—public entertainments and private hospitalities,—travel abroad and at home,—and these meet the wants of what are called emphatically the leisured classes. But with the shortening of the hours of labour, which is one of the forms of modern progress in the interests of both physical and intellectual development, there comes into the possession of all the working-classes an amount of leisure which it is difficult for them to utilise profitably and cheaply.

A man who gets as much for nine hours' work as he did for ten is poorer at the end of the year if he spends more money through not knowing what to do with his time. The artisan or the day labourer takes all the public holidays at his own cost; and it shows how deeply rooted is the idea that a holiday is good when he clings to it, even though he both loses wages and spends money.

The author of a book on "The Soul, its Sorrows and its Aspirations" (Professor Newman, I think), expresses his conviction that the working-classes, then more uneducated than they are now, found the enforced idleness of the Sunday a weariness, and that a greater boon would be given by having two half-holidays,—one on Sunday and one on Wednesday,—in its stead. This he advocated in the interests of the spiritual life, as well as of the intellectual and moral, and looking on the Sabbath as made for man, and not man for the Sabbath; for nothing is more deadening to devotion than keeping up its forms when the heart is not in them. But the half-holiday could not be utilised for a visit to a friend at a little distance, and for keeping



up family associations, like the whole day. In French life, we notice that the sempstress or shop-girl looks forward to her turn of a *dîmanche tout entier*, a quite whole Sunday, which may come every other week or every fourth week. She certainly is not overburdened with leisure, for the hours of work in France are longer than in England, and there is no weekly half-holiday, such as Professor Newman suggests, to compensate for the encroachment on the Sunday's rest.

The difficulty of finding cheap and innocent recreation for the leisure hours the working people have fought so hard for appears to be at times so great that many men of a higher station look on them as a doubtful good. The time has come to the workman before he knows how to use it; and the theatre, the music-hall, and the public-house have more attractions for him than the reading-room or the book at home. It is not so much instruction or information that the tired workman pines for: it is cheerful talk with his fellows about the news of the day, and that cannot easily be had at home. The female workers, such as girls in clothing and vest factories, who now have their day limited, and who on the average, earn considerably less wages than those of the other sex, though they spend too large a proportion of their wages in dress, utilise their leisure so as to save money rather than to spend it.

We should be sorry to have it thought that our remarks are applied to working-people generally. What we say, however, is, in plain words, that many of those who depend on their daily toil to keep body and soul together, had they to work but six or seven four hours during the four-and-twenty, would find even then little time for leisure. We have not far to go to convince ourselves of the fact.

AN OLD COLONIST.

#### THE CITY CHURCHES.

At a meeting of the Council of the City Church and Churchyard Protection Society, Mr. Toulon in the chair, it was announced that another City rector had been served with notices that his church is scheduled for demolition by a railway company. The London and South-Western Railway having scheduled the church of the united parishes of St. James Garlickhithe, and St. Michael Queenhithe, together with the church of St. James Garlickhithe, in a Bill to be introduced in the forthcoming session, the Council has unanimously decided to repeat their action of 1879 with respect to the church of St. Mary-at-Hill, which was scheduled by the Inner Circle Railway, but by the interference of the President of the Society, Lord Devon, in the House of Lords, and by the Hon. Percy Wyndham, M.P., in the House of Commons, a clause was inserted in the Bill in Committee binding the company to take another route, and the church is still standing.

The Council determined not only to give this railway Bill the utmost opposition in their power, but also the Bill which is threatened to be introduced into Parliament in the coming session to demolish the City churches in a wholesale manner; the Union of Benefices Act of 1860 having proved a perfect failure, since the founding of the City Church and Churchyard Protection Society in 1879, not one City church having been destroyed during the last three years.

The following resolution, proposed by the Rev. Arthur Trower, and seconded by Mr. Henry Wright (honorary secretary), was carried *nem. con.*—"That the Council of the City Church and Churchyard Protection Society learn with much regret that the Church of St. James Garlickhithe has been scheduled by the new scheme of the London and South-Western Railway. The Council are prepared to oppose such a scheme by every means in their power on the ground that the church is one of Sir Christopher Wren's masterpieces, that there is a good congregation and a resident population, with the Rector living in the City."

Carlisle.—A new coffee tavern has been opened here. It has been built at the sole cost of Messrs. Ferguson Bros., by Mr. Geo. Black, contractor. The architect of the building was Mr. Geo. Dale Oliver.—A new mission-hall, class-rooms, and keeper's house is about to be erected in connexion with St. Paul's parish. Plans, prepared by Mr. Geo. D. Oliver, architect, have been approved, and tenders will be invited shortly.

#### GLASGOW MUNICIPAL BUILDINGS COMPETITION.

THE assessors, Mr. Chas. Barry and Mr. John Carrick, the City Architect, have got through the first part of their duties. Their task has been to examine 125 sets of sketch designs, sent in by 110 competitors (several sending more than one design), and to reduce them to ten, whose authors are to compete in much more detail. Each of the ten, it will be remembered, is to have 150l. towards his expenses; and the one eventually adjudged the best is to have the commission as architect, the estimated cost being a quarter of a million,—i.e., if he prove (when his envelope is opened) to be a man of good repute, and fit to be entrusted with so large a work.

The assessors have laid it down as a principle not to open any of the envelopes, not even those of the selected ten, but, as our advertising columns show, to inform them by their mottoes in the public papers of their position.

The conditions for the second and final stage of the competition have been prepared. The final designs are to be sent in on the 1st of June. We understand that some very fine designs have been sent in, and are glad to infer that Classic architecture still has distinguished and able exponents.

#### DUBLIN SCIENCE AND ART BUILDINGS COMPETITION.

IN reply to the offered premiums in this competition, sixty-eight sets of designs were received, and from these the committee appointed for the purpose selected five, the authors of which have received, or are to receive, 150l. each, with instructions to enter a final competition, the author of the best design to have charge of the works at the usual rate of commission.

We learn that of the selected five, three are from London, one from Liverpool, and one from Bolton.

It will be some time before the final competition will be determined, as the instructions have only just now been issued. The following compose the Committee of Selection:—Lord Powerscourt, Sir George Hodson, Sir Robert Kane, The Lord Major (Mr. G. Moyers), and Mr. John McCurdy. Colonel Festing, R.E., on behalf of the Science and Art Department, and Colonel Rae, R.E., for the Board of Public Works, act as Assessors.

#### FROM ABROAD.

*Ancient Roman Architecture.*—The *Hamburger Nachrichten* reproduces an address delivered by Professor Eissenhardt before the Association of Art and Science, dealing with the development of architecture in ancient Rome. The old Roman house covered with straw and with three divisions, was considered by the lecturer as closely resembling the type of domestic architecture described by Galenus as existing in his Pergamonic home, and of which an example may still be seen in the so-called house of Romulus at Rome. Roofing with shingles formed the next step, and then progress seems to have remained stationary until Rome entered upon the development of culture which was working its way from the East. The want of trees in the colonies bordering on some parts of the Mediterranean caused the inhabitants to devote attention to substitutes for wood. From the investigations made it would seem that mortar was composed at an early period of pozzolano earth and lime. Beams were formed of planks and boards joined together by some adhesive substance. The first notable change came from Greece in the shape of peristyle buildings, in which marble and burned brick took the place of air-dried bricks. Staircases do not, however, seem to have much advanced beyond primitive models and the absence of windows in the walls (as still seen in outlying Italian villages) forms a disadvantage. Afterwards there arose a distinct taste on the part of Roman architects instead of a mere imitation of foreign models. The main roads were first laid with loose stones, and were afterwards paved. The Via Appia is a notable instance of Roman street-making; structures of a magnificent character arose, such as triumphal arches, baths, bridges, and aqueducts. But while Rome thus advanced in architecture it was near its political downfall; after which architecture, in common with other arts, was for many ages in a dormant condition.

*Wall-paintings at the Emmeran Church at Mayence.*—The most recent examinations seem to have established the fact that the whole of the church had wall-paintings of a similar character to those discovered some time ago in the northern side aisle. The whole of the walls have been freed from the parget with which they were covered, and much valuable work has been brought to light. Sketches have been taken of the various subjects discovered, where they have been sufficiently preserved to admit of this being done.

#### SAFETY IN THEATRES.

The discussion of this subject has spread far and wide. M. E. Colibert, architect, of Madrid, has addressed a letter concerning it to the "Municipalidad des Deux Mondes." After urging, as others have done before, that where theatres are isolated, special staircases should be formed on the side walls of the building communicating with the different floors, he makes the bold proposition that where the theatre is surrounded by other buildings the staircases of these should be utilised by means of openings through the party-walls at different levels. Iron doors, and a guardian at each during every performance, would afford means of emptying the house with rapidity in the event of fire or panic. The inhabitants of the houses would receive compensation for the interference with their privacy. The public safety, says M. Colibert, requires that a sacrifice of money shall be substituted for human hecatombs.

#### THE ARTISANS', LABOURERS', AND GENERAL DWELLINGS CO., LIMITED.

SIR,—My attention has been directed to a paragraph in an article that appeared in the *Builder* of December 24th last, entitled "The King of Spain's Commissioner on English Artisans' Dwellings," in which it was stated that Senor Belmas, although speaking very favourably of the Shaftesbury-park Estate, yet found the structures built thereon "somewhat dimsy;" at the Queen's-park Estate he is reported to have thought that the land was very damp, and that some of the houses were being built on refuse.

Such statements, if left uncontradicted, may create a very unfavorable impression, on the part of your readers, of the operations of the Company, and may tend to discredit the good work it is now carrying on. I must therefore beg leave, as the architect of the Company, to state—in the first place, that the dwellings of the Company are built in a much more substantial manner than is usual in the erection of such small cottage property as that which it is the object of this Company to build, and that it could not be built more substantially unless much higher rents were charged. Secondly, at the Queen's-park Estate the cottages are not being built on refuse; the trenches are being carried down in every case to the solid ground. There is no refuse on the estate, but in cases where the ground is filled up, a layer of concrete is laid over the whole area of the building, as now required by the Buildings Act. The land is a stiff clay soil, and as there are from 400 to 500 cottages now being built thereon, the roads in that part of the estate are of course much cut up, and the surface drainage is interrupted, so that no doubt the land does appear to be very damp after heavy rains; but when the houses are finished and the roads made, I can confidently state that on no other building estate will there be better drainage than at Queen's-park.

I can find no record of Senor Belmas visiting the estates of the Company, and much regret he should have been so much mistaken and that he should have published such opinions as he appears to have formed without endeavoring to learn something of the important operations of the Company from those whose duty, as well as pleasure, it would have been to have afforded him every information.

The Artisans', Labourers', and General Dwellings Company exists solely for the purpose of erecting cheerful, healthy, and properly-constructed cottage homes for the industrial classes, at as cheap rentals as is consistent with the payment of a very moderate return by way of dividend on the capital expended. The rentals vary from 7s. to 13s. per week; but on a new estate which is just now being developed



at Hornsey, the rentals will be very considerably lower.

In conclusion, allow me to state that a due appreciation of the Company's work is sufficiently shown by the fact that houses cannot be built fast enough for the requirements of the tenants, and that on the two large estates of the Company, above mentioned, the loss from empty houses and non-payment of rent is quite inappreciable when compared with the rentals received.

ROWLAND PLUMBE,  
Architect to the Company.

#### THE USE MADE OF A FREE LIBRARY.

THE borough of Middlesbrough-on-Tees has had now a free library for ten years, and in the decade there has been an interval long enough to appreciate the uses of such an institution in a town that needed such a one, but was not the most likely to furnish readers. It is, as most readers know, a new town, comparatively—a town that has attracted to itself a vast population from many parts. Agricultural labourers have been drawn in; ironworkers from Staffordshire and Wales; shipbuilders from Scotland, and others,—many without taste for reading. There was, down to ten years ago, a Mechanics' Institute that had a comparatively large number of members, but which deemed the free-library system more likely to attract readers, and transferred its library as the nucleus for that of a more popular one. Thus, and with the support of the penny rate, the new institution started ten years ago. Its receipts for the financial year just closed were 746*l.*, of which 700*l.* was derived from the town council, and the bulk of the remainder was in the form of fines. With this sum two large free reading-rooms have been kept up and the free library maintained, 392 books being added in the year to the 8,991 previously in the library. In addition, some sixty-three books, worn out by circulation, have been replaced, and six books that had been lost were replaced also by the borrowers or guarantors. When the library was first commenced 33,073 books were issued yearly; last year 58,748 books were so issued, so that the increased popularity of the institution and the enlargement of the taste for reading is at once shown. And it is interesting to notice that the increase is not confined to fiction alone. The number of issues of books on theology has doubled in the decade; those on moral philosophy more than doubled. Natural philosophy has added 50 per cent. to the amount of the issues at the beginning at the beginning of the decade; history and biography are doubled; drama and poetry are increased in like ratio; art-books are trebled; whilst essays and lectures are less used than ten years ago. Periodicals have doubled their issues; fiction has been not quite doubled, though it is of course now, as of old, the preponderant issue, and juvenile books have been issued also twice as much. There have been 8,741 borrowers of books since the beginning of the library, of whom some 40 per cent. may be said to be employers, clerks, and professional persons; 35 per cent. are artisans; 16 per cent. are working women; and the bulk of the remainder are boys and girls at school. Out of the issues of the books 67 per cent. is the proportion of books of fiction; over 8 per cent. that of history and biography; natural history, &c., and magazines circulated last year over 5 per cent. each; and juvenile books stand next highest in the remaining classes on the list.

These dry facts record more or less the story of the Middlesbrough Free Library. It is true that out of a population of 50,000, one-fourth only are borrowers, and that is a small proportion, but it is a growing one, and to it is to be added the vast numbers who use the free reading-rooms frequently. The library is growing slowly, and as it grows it must be expected that it will become increasingly popular. But the main idea to be drawn from the record of ten years' work is that the people increasingly appreciate their institution; that it draws a larger number of supporting borrowers and readers; and that there are circulated amongst them a much greater number of volumes than under the old system. And as the cost to the ratepayers,—1*d.* in the *£.*,—is but 700*l.* a year, it must be considered that as one of the real "resources of civilisation," and as one of the humanising influences of the times, it is one of the cheapest. Those who know the town and its singularly mixed, and at times rough, population, will recognise the fact that the opening of two free reading-rooms and a free library have done much good and familiarised the people with a literature that would have been in considerable degree above their means of acquisition. Middlesbrough has not hitherto housed her Free Library over well; but in the municipal buildings that she is expected to build soon, it is to be hoped that there will be not only suitable but elegant preparation for what is one of the cheapest, the most useful, and the best known of her institutions, and what must have a higher use in the future than in the past.

#### BUILDING PATENTS.\*

##### APPLICATIONS FOR LETTERS PATENT.

- 5,721. J. S. Stevens and C. G. Major, Battersea. Hydraulic lifts. Dec. 30, 1881.  
5,735. T. Drake, Huddersfield. Apparatus for heating water for warming rooms, &c. Dec. 31, 1881.  
5,747. A. M. Clark, London. Roofs for protection of buildings in course of construction, &c. (Com. by A. C. de Barbaran, Paris.) Dec. 31, 1881.  
30. Sir W. W. Hughes, Bayswater. Fire-grates. Jan. 3, 1882.  
33. S. L. Hunt, London. Street cleaning and sweeping apparatus. Jan. 3, 1882.  
42. E. G. Lakeman, Modbury. Stoves and furnaces. Jan. 4, 1882.  
46. W. Haughton, Temple. Open fireplaces or grates. Jan. 4, 1882.  
54. J. Wetton, Abergavenny. A chimney-pot. Jan. 5, 1882.  
65. H. H. Lake, London. Construction of bridges. (Com. by G. Eiffel, Paris.) Jan. 5, 1882.

##### NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

- Jan. 3, 1882.  
3,820. F. G. Pearson, Dudley. Apparatus for facing or enamelling bricks or tiles. Sept. 2, 1881.  
5,279. T. Ivory, Edinburgh. Heating and cooking by gas, &c. Dec. 2, 1881.  
5,590. H. H. Lake, London. Door checks, &c. (Com. by L. C. Norton, Boston, U.S.A.) Dec. 21, 1881.

Jan. 6, 1882.

- 4,102. A. Bedborough, Westminster. Window sashes and frames. Sept. 23, 1881.

##### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending January 7, 1882.

- 2,251. T. A. Brocklebank, London. Patting together or affixing stairs, steps, &c.  
The stairs, &c., are said to be held together by clips or crutches, having bolt or axle, and adjusted by springs or weights. (Pro. Pro.) May 28, 1881. Price 2*d.*  
2,382. H. A. Bonneville, London. Shutter workers.

These gears consisting by which the shutter is raised or lowered, consisting of a spur-wheel and pinion, actuated by a crank on a spindle brought down to the sill of the window. (Com. by R. D. Blake, Brooklyn, U.S.A.) (Pro. Pro.) May 31, 1881. Price 4*d.*

- 2,385. H. J. Hadden, Westminster. Ventilator or chimney tops or caps.

These consist of two cone frustrums, provided with a conically-shaped cap, supported from the upper cone frustrum. The lower frustrum has an air-tube inside, and is pierced by a number of holes at the level of the top of the air-tube. (Com. by R. J. Evans, Toronto, Canada.) (Pro. Pro.) May 31, 1881. Price 2*d.*

- 2,406. W. Chrystal, London. Chimney-tops or ventilators.

A number of upright plates are fixed radially round the central thoroughfare, and between each two are a number of upwardly-inclined deflecting plates or louvres. May 31, 1881. Price 8*d.*

- 2,443. C. H. von Ullner, London. Apparatus for regulating the flow of water, &c.

This is applicable chiefly to water-closets, &c., and consists of a syphon, which is brought into action by a movable box, which is raised by a lever, and fills the syphon. (Pro. Pro.) June 3, 1881. Price 2*d.*

- 2,464. J. Taylor, London. Tiles.

In order to lighten the roof, by not requiring so many tiles, these are made of hexagonal shape, so that they do not overlap so much as the ordinary tiles do. They are secured by a single hook, which passes through the lower tile to the shoulder, leaving the neck projecting, to secure the tile above. (Pro. Pro.) June 4, 1881. Price 2*d.*

Oldham.—Messrs. Platt Bros. & Co., the machinists, have determined to try the electric light in the moulding and joinery portion of their premises at Werneth.

\* Compiled by Hart & Co., patent agents, 38, New Bridge-street, E.C.

#### THE BRIGHTON SANITARY EXHIBITION.

Sir,—Exhibitors are often unreasonable, no doubt, but this altogether fails to account for the indignant feelings entertained by a large proportion of London and other exhibitors at Brighton. A protesting circular, issued just before the close, met with very general approval.

Our own exhibits were not only not examined, but were not even inspected by the judges. We, therefore, have no award whatever, although there were awards of four grades, and the chairman of our section was chairman at Eastbourne, where we had an award of the first class. As it is our intention to take legal proceedings to recover the whole of our expenses, the matter will probably undergo a thorough investigation, and Brighton will have to be more careful another time. The failure is the more to be regretted, as the exhibition has, in other respects, been a great success.

FREDK. EDWARDS & SON.

#### INVADDED BY ANTS.

SIR,—Allow me to make known, through your paper, an awful epidemic, in the hope that some one will suggest a remedy, and as I am not the only sufferer, the public will be greatly benefited thereby. I have lived in this house (near Onslow-gardens) for some years, and have made alterations and additions from time to time. The basement being overrun with rats and mice, I had the flooring joists and sleeper-planks taken up, and concreted the whole of the flooring of the basement. This soon proved an effective remedy, and we had no more visitors in the shape of rats and mice. About eighteen months after this we noticed, for the first time, some ants, and thought we had only imported these few from a baker's close by, but we soon found out that they were marching all about the drawers, &c. I then sent my family away, as I felt certain I could cure them by painting and stopping up every crevice, including ceiling and cement flooring. After a lapse of about a month, however, we found out the urgent visitors liked us as much as ever. I then had the walls plastered with Paris cement, thinking I was sure to stop them coming through some unobserved crevice, but found it useless, and have since tried everything that a practical mind could suggest, such as watching their movements, as they have got a regular place of assembly on the warm hearth, where they come marching from all quarters of the kitchen in regular lines; by throwing turps all over them and setting light to it; brushing them up with a wet paint-brush; laying Cayenne pepper all about the place, and continually washing the whole place with strong soda water and soft soap, until now it has come to such a pitch that either I have to get out of the place or find a means for their destruction. What can be done? H. S.

#### ANTHRACITE.

SIR,—In your issue of the 24th ult., I see a warning from "C. E." against the use of anthracite coal for domestic purposes. Any one unacquainted with such matters might suppose from "C. E.'s" statement that the peculiar use of anthracite was peculiar to anthracite coal, whereas it is common to all; and I am not aware that we can burn any carbonaceous matter without producing it. But, as regards the purity of our rooms, it is of little importance what fuel we burn; where the means of carrying away the noxious gases are efficient, and they certainly may be so,—we are safe, otherwise we must suffer. In my opinion, the use of anthracite offers the best means at present within our reach for the abatement of smoke. Of its practical use and cheerful smokeless appearance, each may judge for himself by studying the present exhibition at South Kensington. As regards its unwholesomeness or otherwise we may surely all be content to wait the result of tests conducted by a body of scientific gentlemen who will shortly enlighten us with their report. In the meantime I earnestly submit that it is most desirable that nothing should be said or done which may, however unintentionally, be calculated to create premature prejudices and unfounded fears.

I for one have great faith in the present movement, and, though reaching fast my "three score years and ten," still hope to enjoy the comfort of a warm room, a cheerful fire, and pure air.

S. R.

Costly Mortar.—News has been received at Acora confirming the original report of the murder of 200 young girls by the King of Ashantee, for the purpose of using their blood to mix with the mortar employed in the building of a new palace. It is understood that the girls were obtained from some neighbouring tribes, on whose town raids were made by the king's followers in order to raise the required number of victims. How long are such monsters to be endured?



## CHURCH-BUILDING NEWS.

**Ratby.**—The parish church of Ratby, in the diocese of Peterborough, has been re-opened, after having undergone a partial restoration under the superintendence of Mr. Nicholas Joyce, architect, Stamford. The whole of the roofs have been renewed and covered with local slates. The nave and aisles have been fitted up with new benches of pitch pine, and the chancel with stalls of oak. A new vestry, with chamber for heating apparatus underneath, has been constructed in the north side of the chancel. The old brick porches have been removed and a new porch of stone built on the north side. The nave arcade has been restored, and the decayed stonework in the walls, as well as in the windows, doorways, plinths, and string-courses, has been cut out and replaced with new stone. In the floor of the church were a large number of memorial slabs; these have been replaced in the positions they formerly occupied in the passages, the spaces between the slabs being made up with new slate paving. The pulpit is of Oasen stone, on a shaft of red stone; it is circular in plan, and has a richly-carved capping; in front are figures in low relief of St. Philip and St. James-the-Less. A stained-glass window by Mr. Francis A. Oldaker, of Epsom, has been placed in the south aisle as a memorial to the Geary family. The Committee have already expended over 3,000l. on the work. The contractor is Mr. James Stanford, of Ashby-de-la-Zouch. The hot-water apparatus is the work of Messrs. Messenger, of Loughborough, and Messrs. Brawn & Son, of Birmingham, have executed the ironwork.

## Books.

**Authorship and Publication: a Concise Guide for Authors in Matters relating to Printing and Publishing.** London: Wyman & Sons. ALTHOUGH intended chiefly for those who desire to send forth their thoughts or knowledge through the press, or, at any rate, are young authors, Messrs. Wyman's little volume contains matter which the oldest hand may find useful. It gives not merely those particulars concerning paper, printing, binding, and publishing, the preparation of "copy," and the corrections of proofs needed by the tyro, but it treats of the best modes of illustrating books, and of the law of copyright, and contains a valuable Bibliographical Appendix, including a list of books which give outlines of all the published literature of different subjects. It is an excellent specimen of printing and "getting up," and will doubtless, of itself, send many customers to their well-appointed establishment in Great Queen-street.

## VARIORUM.

The two volumes of "The Letters of Charles Dickens," edited by his sister-in-law and his eldest daughter, when published some short time ago (Chapman & Hall, Limited), received from us unqualified commendation. A third volume is now issued by the same publishers, and we give it as hearty a welcome as we did to its predecessors. It contains a number of delightful letters, and scarcely one that does not contain a characteristic touch very properly preserved. The volume includes the letters addressed to the late Lord Lytton, which could not be obtained in time for the previous volumes. Miss Dickens and Miss Hogarth have done well their labour of love. "The First Book of Knowledge," by Fredk. Guthrie, F.R.S. (London: Marcus Ward & Co.), will be found useful. The author says, at starting, "Clay is a stuff. A brick is a thing. I want boys and girls, and so, by and by, everybody, to know something about stuffs and things. . . . So I take such a house as most of us live in and show, first, of what stuffs, and how, its parts are made." A great deal of elementary knowledge is communicated, but Mr. Guthrie should have called in an architect to read it with him, and he would then have avoided a number of slips which enable much less instructed persons than himself to grin. For example, instead of saying, as he desired:—"Putty.—To fix panes of glass in sashes, putty is generally used," he thus misdirects his good little boys and girls,—"Putty.—To fix windows in their frames, putty is generally used." However, this, and such as this, are but specks, and we would gladly aid the circulation of the book. —The sale in England of American serials

appears to be spreading. *The Monthly Index* (Spruce-street, New York) says that 10,000 copies of the Christmas number of *St. Nicholas* have been sold here on the present occasion, 8,000 being the usual number. *St. Nicholas* is a well-illustrated magazine for young folks, of which Warner & Co. are the London publishers.

—A novelty in magazine literature has this year been introduced in *Cassell's Magazine*, under the title of the "Family Parliament." The discussions are exciting interest, and a new debate, we see, is to be opened in the February number on the question, "Are Early Marriages Unthrifty?" The debates are open to all readers of the magazine.

## Miscellaneous.

**A Harbour of Refuge.**—The Rev. Francis Gell, the vicar of Lydd, writes:—"Another serious casualty in the crowded Downs confirms the opinion expressed long ago by the Great Duke, when he was Warden of the Cinque Ports, that a harbour of refuge at Dungeness is essential to the safety of our mercantile marine. When that opinion was first delivered the carrying trade of England had not reached anything like its present gigantic dimensions. The President of the Board of Trade told us, the other day, that we have now invested in our shipping a hundred millions of money and 200,000 men, to whom wages are annually paid to the amount of ten millions; not to speak of 100,000 men, to whom seven millions more are paid for building and repairing ships. In the twenty-six years last past an army of the finest men in the world have been drowned on the coasts of England,—18,550 men! A large part of the losses in the Downs, and on the awful Goodwin, would be averted if a breakwater and harbour of refuge were run out from Dungeness, behind which ships of any tonnage might lie at anchor in these terrible south-westerly gales.

**London Association of Foremen Engineers and Draughtsmen.**—On Saturday the twenty-ninth annual meeting of the members of the London Association of Foremen Engineers and Draughtsmen was held at the City Terminus Hotel, Cannon-street, under the presidency of Mr. Joseph Vincombe (of the Royal Arsenal, Woolwich). After the election of some new members, the auditor's half-yearly report and balance-sheet was submitted to the meeting, which showed gross receipts (including members' contributions of 135l. 3s. 6d., and balance carried forward of 62l. 19s. 9½d.) of 221l. 5s. 9½d. The expenditure of the period under review was only 78l. 3s. 1d., leaving a balance in the treasurer's hands of 143l. 2s. 8½d. The ordinary fund amounted (with the sum in the hands of the treasurer) to 604l. 2s. 0½d. Of the superannuation fund, the total amount, which was invested in Three per Cent. Consols, was 21,419l. 18s. 5d. The payments to members during the six months under that account were 37l. 7s. 6d. The widow and orphans' fund reached a sum of 92l. 14s. 2d.

**College of Practical Engineering.**—We have received from this College at Muswell-hill a copy of a pamphlet on the subject of engineering education. It is written in the form of a letter to a friend by one of the pupils of the College, and describes the means in force for imparting engineering instruction to students both at home and abroad. It seems sensibly written, but it strikes us the College will require stronger testimonials than a letter from one of its pupils. The new college was established in the autumn, under the auspices of a number of practical engineers, and the fact was mentioned by us at the time.

**The National Freehold Land Society.**—The thirty-second annual report just now issued shows that the subscriptions during the year were 631,395l.; the withdrawals, 493,976l.; and the members' capital at the end of the year was 1,666,930l. The freehold and leasehold securities and properties have been increased to 1,409,787l., and the convertible securities to 327,545l. The rate of profit on uncompleted shares was three per cent., and of the interest on completed shares four per cent. throughout the year, the gross profit for the year being 74,732l.

**All Saints' Church, Derby.**—A new set of quarter chimneys has just been erected in this church, which play upon the whole of the ten bells, the largest of which is 32 cwt. The whole of the work has been carried out by Messrs. Smith, Midland Clock Works, Derby.

**Meagham.**—A new Roman Catholic chapel has been erected here, at the cost of the Countess of London and her family, who have also provided a proscriptory conveniently adjacent. The chapel is of red pressed brick, with stone dressings. The front next the road has a doorway in the centre leading into a spacious entrance lobby, and in a richly-moulded heading over it has been fixed a corbel to carry a life-sized statue of St. Charles Borromeo—the patron saint of the chapel,—and there is also a rich canopy with battlemented cresting in the sill of the three-light traceried window of elaborate design which is placed in the wall above the statue. The nave,—which is to be also used as a school,—will provide sitting accommodation for about 150 persons. It is well lighted from the aisles, and is covered with an open-timbered roof. The chancel is lighted by single-light cusped-headed windows at the sides and a quatrefoil window in the gable. In the opening between the chancel and the nave is placed a revolving shutter so as to shut the nave off when used for school purposes. The contractors for the work were Messrs. W. Beekworth & Son, of Whitwick, who completed the work some weeks before the expiration of the contract time. The statue of St. Charles Borromeo has been executed by Mr. R. L. Boulton, of Cheltenham, and the tabernacle by Messrs. Vaughan & Brown, of London. Mr. Stone, of Ulverston, furnished the revolving shutter, which is of great width. Mr. Thompson, of Liverpool, provided the sittings, and the whole of the works have been designed and carried out under the superintendence of Mr. C. G. Wray, architect, London.

**St. Botolph's Church, Bishopsgate.**—Two painted glass windows have been placed in screens at the east end of the church. They are about 12 ft. wide by 6 ft. high. In the window on the south side is "The Last Supper," and in that on the north side "St. Paul preaching at Athens." They are both the work of Messrs. A. L. Moore & Co., of Southampton-row, London. The following inscription is placed at the bottom of the screens:—"These windows were erected out of the fund for beautifying the Parish Church, bequeathed by Joan Wood, 1600, and Joan Ford, 1644. William Rogers, M.A., Rector. Frederick Dadswell and Frederick Collier, Churchwardens. 1832."

## TENDERS.

For the erection of a school-chapel, Chester-road, Sandrieland. Mr. H. T. Graddon, architect. Quantities by Mr. G. D. Irwin:—

T. P. Snares, Sunderland	21,976	0	0
Swan & Co., Sunderland	1,946	10	0
G. H. Hodgson, Sunderland	1,830	0	0
J. Coulson, Sunderland	1,850	0	0
Hirst & Sons, Sunderland	1,620	0	0
J. L. Miller, North Shields	1,565	15	6

For the addition of a billiard-room at Laughton House, East Montney, for Mr. G. le Doux. Messrs. F. Percy Harrison, Cooper, & Co., architects. Concrete floor and walling to ground-level not included:—

Alderton	£368	0	0
Moore	313	5	0
Palmer & Polkington	302	0	0
Dashwood, Farnham (accepted)	234	0	0

For new 5-gal. brewery buildings at Barton-on-Trent, for Mr. Peter Walker. Messrs. Scamell & Colyer, architects. Quantities by Messrs. R. L. Curtis & Sons:—

## No. 1 Contract.—Buildings only.

J. Morter, London	£23,229	0	0
Kirk & Randall, Woolwich	21,645	0	0
Davies Bros., Wrexham	23,309	0	0
Dennett & Ingle, Nottingham	24,387	0	0
J. Garlick, Birmingham	22,994	0	0
J. Brown, London	22,494	0	0
Hewell & Son, Bristol	22,337	0	0
H. Lovat, Wolverhampton	21,634	0	0
Dakin & Smith, Lichfield	21,885	0	0
J. Hartley, Birmingham	21,839	0	0
Low & Sons, Burton (accepted)	20,409	0	0

## No. 2 Contract.—Girders and Columns.

Patent Shaft Company, Snelthwick	£8,245	0	0
Lesidaw & Sons, Glasgow	5,830	0	0
Horsley Iron Company, Tip-on	5,352	0	0
Cockey & Sons, Frome	5,138	0	0
Cochrane & Co., Dudley	5,047	0	0
Thornhill & Warham, Burton	4,771	0	0
Handyside & Co., Derby	4,709	0	0
Kastwood & Swinger, Derby (accepted)	4,376	0	0

No plant included in the above tenders.

For the construction of road and drainage work on the United Land Company's Earmstead Estate:—

J. W. Simpson	£800	0	0
J. O. B. Marshall	832	0	0
V. Norr	825	0	0
Unassigned tender	790	0	0
G. Mitcham	750	0	0
G. Taylor	720	0	0
Ford & Everett	710	0	0
G. Krock	695	0	0
Wilkes & Co.	670	0	0
James Pacey	640	0	0
James Bloomfield	539	0	0
Jesse Jackson (accepted)	533	0	0



Hatton Garden, Liverpool; Great Clyde Street, Glasgow; and at Cyprus.



# The Builder.

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SATURDAY, JANUARY 21, 1882.

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### Destruction of Madras Harbour.

HE failure of a public work is not always an unmitigated misfortune. When the directors of the Great Western Railway met their engineer after the fall of Maidenhead Bridge, it was with faces of alarm and dismay that they referred to the subject. "It is an excellent thing that it has happened," said Mr. Brunel; "I was going to build a good many bridges on the same plan, and now I shall do better." It is, however, somewhat late in the history of the Madras Harbour for the engineer to have been taught by fact that he had under-calculated the force of a storm by no means of the most violent character known to occur on that exposed coast.

The plan of the Madras Harbour is extremely simple. The natural shore-line runs almost exactly N. N. E. and S. S. W. The shore shelves gradually, attaining the depth of seven fathoms at about 2,200 ft. from the beach. Two piers are run out at right angles from the shore, to the distance of 3,000 ft., and at that width apart. They return at right angles, the plan showing that the extreme angles are rounded off with a radius of about 500 ft.; and they left an opening of 450 ft. wide in the middle for the entrance of the shipping. The area thus protected is a square of the area of nearly 1,000,000 square yards, less the slight loss at the return of the walls. The monsoons blow from the N. E. in the autumnal, and from the S. W. in the vernal, half of the year; and the waves thus caused drive the sand before them in a southerly or northerly course, as the case may be, along the shore. The sea strikes obliquely, in the former case, on the south, and in the latter on the north pier and the face wall. The gale which did the mischief we have to describe, on the 12th of November last, blew from the north-west at Madras, while at Bimpipatam it was N. N. E.; and at Negapatam, due west. The vortex of the cyclone indicated by these currents was supposed to be about 150 miles east of Madras.

The principle on which Mr. Parkes, the engineer of the harbour, relied for the safety of his work, as stated by him in a lecture delivered at the Central Government Museum at Madras, on the 12th of February, 1881, was, that the action of the sea ceases to disturb loose material at a depth of 12 ft. under ordinary circumstances. In the case of tremendously heavy seas, however, he admits that the action is felt somewhat deeper. It was therefore thought better "to make assurance doubly sure by going to a depth about which there can be no doubt." Abandoning the principle of founding in the least depth possible, the depth of 24 ft. was adopted, as

giving the most economical proportion of rubble stone and concrete block work. This, of course, could only be fully carried out beyond the four-fathom line.

In January, 1876, the work was commenced by the formation of the rubble-stone embankment, called the North Surf Bank, which was to form the seat of the north pier wall. This bank is composed of laterite, a ferruginous marl, of varying quality, which is unfit for exposure to the destructive action of the sea, but the better qualities of which were considered suitable for the rubble mound. The material was dug at Ambatoor, about ten miles inland, on the line of the Madras Railway. It was conveyed to the shore by the Madras Company, and transferred into smaller trucks, which were run out by native labourers, and tipped into the bank. The action of the sea lowered the bank to a depth of, in some places, 10 ft. below low water, thus forming its own slope. Concrete blocks, weighing about 27 tons each, were lowered by a crane, to take their own bed on this submarine embankment. They were arranged in a double row, forming a wall 24 ft. thick, without, however, any cement or internal tie.

As soon as the harbour piers could be seen, on the morning of the 12th of November, it was observed that the northern and southern piers (those running at right angles from the shore), were intact, but that the eastern piers, lying parallel with the shore, were breached in several places. The "Titan cranes," as they were called, on these piers were, however, standing. At 10.30 a.m. a great sea struck the southern pier. It leaped some 50 ft. into the air, and the Titan crane collapsed and fell. At 11.30 the crane on the other portion of the pier gave way, and by this time some 700 ft. in length of the blocks forming the two piers had been washed away. The sea now rolled as a prodigious surf into the harbour. The two steam hopper barges moored within it were dashed together and sank, and the captain of the barges and some twelve natives were drowned. The *Madras Weekly Mail* says that out of 7,150 ft. of wall, 3,000 ft. failed. The velocity of the wind at the utmost, according to the astronomer of Madras, was thirty-three miles per hour, being at its height at 11 p.m. on the 12th, and at 1 a.m. on the 13th. The whole range of the wind for the twenty-four hours, from midnight on the 11th to the following midnight, was 530 miles. The rainfall between 1.30 a.m. and 8 p.m. amounted to 8.19 in., being the twelfth heaviest fall on record at Madras since 1803.

The extremities of the overthrown piers are in 48 ft. of water. When the wind moderated, it was ascertained that the whole eastern face of the harbour had been wrecked. Here and there, at long intervals, half a dozen or so of blocks appeared above the water; but for the most part, there was a series of great gaps or breaches, one of which was 18 ft. deep; showing that three out of the four courses of blocks have been swept away.

The same storm that so fatally disproved the calculations on which this harbour was constructed, tested, with more satisfactory results, the breakwater at Colombo. There, however, the wall was 34 ft. instead of 24 ft. thick. Chases, 18 in. wide and 6 in. deep, are cut in the back and face of each block, so as to form vertical holes of 18 in. by 12 in. when they come together. These holes are filled with concrete, rammed home, and forming a vertical bond; while the joints of the blocks are in the centre of the upper and overlying layers. Our Madras informant does not say on what this 34 ft. wall of Sir John Coode is founded. But in the case of the Madras wall the want of bond in the structure itself must divide with the specific gravity of the material employed the blame for what has occurred. We can only hope that the result will be to show to what depth the action of the waves has penetrated, in a storm which can by no means be called a typhoon, or one of the fiercest to which the locality is exposed.

We have no wish in any way to exaggerate the very serious disaster, or to add to the pain and regret which must be felt by those in any way responsible for it. Our question will be, not who, but what, is to blame. The estimated cost of the outer harbour was 565,000. The actual damage is estimated by a writer in the *Madras Mail* at 100,000. Mr. Parkes, the engineer, has had the experience of the works in Kurraachee harbour, originally designed by Mr. Walker, to which he acted as consulting engineer. Here a straight breakwater, composed of blocks of concrete of the same size as those subsequently employed at Madras, ran out for a distance of 1,500 ft. The Titan steam-crane were here used, and the bedding of the bottom row of blocks, which were set on end, and at a batter of 3 in. in the foot, on the rubble bank, was effected by divers. The hydrographic situation of the two works is, however, as different as it is possible to conceive. The Kurraachee harbour is a large land-locked natural pool, with an area, at high tide, of eighteen acres. The object of the breakwater, or rather the mole, was to protect the narrow entrance to this harbour, and to allow the scour of the backwater to lower the bar. The site is exposed to the south-western monsoon, and protected from the north-western, but out of the region of typhoons. There was, however, ample proof of the action of the waves in the monsoon in causing the wall to split internally over places where boulders had been met with in the foundation. A more distinct proof of the necessity of bonding together the blocks instead of laying them like a row of bricks on end, could hardly be given. The total cost of this work was 109,000.

With regard to the rubble foundation, Mr. Parkes may be credited with having gone on the safe side, as far as the accepted facts of wave-action are concerned. If 12 ft. be taken as the lowest depth to which violent action usually reaches, a depth of 24 ft. gives a large margin of safety. It will be remarked that





there is no evidence as yet of the disturbance of the rubble bank by the storm. In the lowest breach a row of blocks is referred to as left in place. We may thus conclude that the experience obtained in the Kurraachee mole was so applied as to prevent any danger from a block resting in a too narrow a point of live rock. And in this respect we see no cause for impugning the general design.

It is, in our opinion, quite different as regards the plan. At the Manora Point there was, no doubt, admirable reason why the breakwater should be straight. At Madras we can trace no such reason, but the reverse. Nothing can be more simple than the plan of the Madras harbour, which is simply a back yard built out into the sea. We conceive that there were abundant reasons for adopting a very different plan. The effect of the north-eastern monsoon on the northern and western exposures of the harbour is direct and violent. The south-western monsoon blows off the shore. Thus much less resisting power is needed for the south pier than for the other portions of the breakwater. If a bold curved sea-wall had been thrown out from a point to the north of the Madras Railway terminus to a position on the seven-fathom line some 500 ft. to the south of the present opening, and then made to abut on a substantial tower, an arched barrier would have been presented to the most violent surf, in the most impregnable form. A curved wall to the south, from a second sea tower to the shore, would have required probably a less substantial section.

That, however, may pass for what it is worth as a theoretic opinion. The question is more urgent whether any improvement in plan would have made up for what seems to us to be the extremely unmechanical way of dealing with a material which needs every aid that the engineers can apply in the way of strengthening its hold on the ground where exposed to a violent sea; if it is, indeed, safe to use at all. At Kurraachee, and subsequently at Madras, the concrete blocks, containing 18 cubic yards, weighed 27 tons. This gives a specific gravity of nearly 2.0, or less than twice the weight of sea-water. Each block, then, when surrounded by a wave, weighed only 13.5 instead of 27 tons, and the force of a wave might then readily be enough to make a mere plaything of such a block if left alone. In our recent articles on lighthouses we took occasion to call attention to the importance of securing the highest possible specific gravity for any building material which is to be exposed to the action of the waves. Granite, magnesian limestone, basalt, quartz, and slate, have specific gravities ranging from 2.5 to 3. Thus, a sea-wall composed of either of these stones, in so far as it depended for its strength on weight alone, would have been, foot for foot, from 1½ times to twice as strong as the concrete wall.

In face of this undeniable fact, it can hardly be disputed that the duty of the engineer who adopts this material is to endeavour to provide, by the internal bonding and tying together of the large blocks, such an aid to their mere resistance of inertia as shall enable them to resist the impact of waves of which the specific weight bears so close a relation to the resisting weight of their own bulk when submerged. The curved plan to which we above referred would have tended to this end. But that each block should have been keyed or joggled to six other blocks we hold to be a primary rule of safety. At Colombo, as we have seen, something of the kind has been successfully carried out. Our readers are aware how this principle was first applied by Smeaton, and how it has been carried out by the Stevensons and our other great lighthouse builders, and that, although they wrought in stone and not in concrete. Whether stone itself, or, as at Colombo, concrete, would be best suited for these internal joggles, may be a matter for discussion; but of the absolute propriety of laying the blocks in bond, and of strengthening the bond by joggles, we hold that there can be no doubt whatever, when the specific gravity of the material is borne in mind.

That we are in no way exaggerating the importance of this error may be seen by reference to the account of the Manora breakwater at Kurraachee that is contained in the forty-third volume of the Proceedings of the Institution of Civil Engineers. We are there told expressly, and shown by the plans and sections, that the sea-wall constructed on the top of the rubble bank consists "of concrete blocks, each 12 ft. by 8 ft. by 4 ft. 6 in., of 27 tons weight, set in place, without bond; so that an end view presents six blocks, two forming the width, and

three the height. This makes a solid vertical wall, of which the width and depth are alike 24 ft. The blocks were laid with an inclination towards the shore of 3 in. to 1 ft. to insure the stability of the end during the progress of the work." The plan is spoken of as enabling each block to fall into place easily, and as helping to obviate distortion from slight errors or subsidence of the foundation. It seems to us that, considering the specific weight of the material, it would have been hardly possible to set the blocks in a less safe manner. In 1872, shortly after the monsoon burst, "eighteen blocks were wrested out of the harbour-side top course in one length of 80 ft." and there were other indications of the effect of setting these blocks "on edge, without bond." In the only plan now before us of the Madras harbour the same dimensions and arrangement of the blocks are shown. It seems to us that disaster is almost courted by such a mode of employing this material. It is certain that great disaster has resulted, and that not without ample warning.

#### BARTOLOZZI AND HIS WORKS.

This handsome book, in two volumes, \* is evidently levelled mainly at print-collectors. The book itself, in its square quarto form, with wide margins, thick-ribbed paper, old English type, as used at "Ye Leadenhalle Presse" (as Messrs. Field & Tuer absurdly call their establishment), and the white parchment binding which has been revived, and is so sure to sell very quickly, evidently is intended as a show production such as collectors of old books and old prints may be supposed to welcome as harmonising with the character of their gennie treasures. Apart from these fancies in the make-up of the book, however, the reception of which may be "as humours and conceits shall govern," some account of Bartolozzi is well-timed at a moment when his works, having, as the author says, climbed up to the bedrooms and even to the attics and lumber-rooms of their possessors, are now descending again to places of honour in the drawing-room. About this renewed taste for his engravings nothing need be said. It is mostly the offspring neither of knowledge nor taste, but merely due to the fact that he belonged to the era of art and architecture of which are now fashionable. As we do not follow fashions, and never would have assigned Bartolozzi's engravings to the attic, so we may be allowed to say that the revived admiration for him, which has been the occasion of the production of the book before us, is overcharged; not, indeed, in regard to Bartolozzi's own workmanship, which is beautiful, but in regard to the artistic value of many of the works he engraved. Many of these, especially the allegorical figures, belong to a style of weak, pretty, characterless art, and though this makes no difference in their merit as engravings, it very much influences their value in other respects, as artistic possessions.

The recapitulation of the main facts about the engraver may be useful to the many who are not likely to purchase a work of this stamp, the main value of which is in the large list of Bartolozzi's works which it contains, and which must render the work almost indispensable to collectors. Bartolozzi was born in 1727, in Florence, and, singularly enough, received his artistic education in that city from an English artist rejoicing in the name of Hugford, who resided there, a circumstance which affords a curious coincidence with the fact that his future career was destined to be almost entirely an English one. It is recorded that he studied anatomy with the greatest diligence, and drew from the life with equal assiduity, thus laying the foundation of that thorough understanding of his work which enabled him to follow out and to translate correctly every indication of the painter whose figure he was engraving, and even led him to be regarded by print-publishers as a *deus ex machina* providentially at hand to correct the drawing of inferior artists, whose work was sometimes accepted for engraving with all its imperfections on its head, under the consoling conviction, "Bartolozzi will make it all right."

\* Bartolozzi and his Works. By Andrew W. Tuer. A biographical and descriptive account of the life and career of Francesco Bartolozzi, R.A. (illustrated), with some articles on the present demand for and value of his prints; the way to detect modern impressions from worn-out plates, and to recognise falsely-titled impressions, deceptions attempted with prints, print collecting, judging, handling, &c.; together with a list of upwards of 2,000—the most extensive record yet compiled—of the great engraver's works. London: Field & Tuer, and Hamilton, Adams, & Co. New York: Scribner & Welford. (3s. 6d.)

Indeed, Sir Joshua himself, it appears, once pointed out, in a print from one of his own figures, how Bartolozzi had improved the drawing of the hands, which he confessed was careless in the original (as, to say truth, it was not unfrequently was). At eighteen Bartolozzi went to the engraver Wagner, at Venice, where he worked at subjects little to his taste, and in a mechanical style imposed upon him by his master, but keeping up at the same time his own power of draughtsmanship in separate studies and sketches, in which he pleased his own fancy. Shortly after his apprenticeship to Wagner ran out, he married "an Italian lady of good family," and went for a time to Rome, and on his return to Venice to practise for himself was in the enjoyment of a considerable and increasing reputation. It was in 1764, at the age of thirty-seven, that he was persuaded by Dalton, Librarian to George III., who had been sent abroad to purchase pictures for the king, to come over to England, where he was appointed "engraver to the king," and stepped easily into lucrative work of other kinds. He also had at once a friend, compatriot, and fellow-worker in Cipriani, who had come over to England four years previously, and the two lived together for some time in Warwick-street, Golden-square. He had a sharp rivalry with Strangé, who was especially irate at Bartolozzi's elevation to the full privileges of R.A., to which the latter had a claim, as being potentially at least a painter, while Strangé was an engraver merely. He had, however, on the whole, a very prosperous career, even in a commercial point of view, earning large sums with what to him was easy work, spending his money also very freely and carelessly, for he was a good-natured self-indulgent man, very fond of enjoyment and good living, and "his port, his cigar, and his biscuit," were the regular accompaniments of his work. He seems to have been a personal favourite, as a man who is carelessly indulgent to himself and to others usually is, and his studio was to a certain extent a fashionable rendezvous. He was a Freemason, and his name as "Brother Bartolozzi, R.A.," appears in conjunction with that of "Brother Stothard, R.A.," to a design painted by the one and engraved by the other in honour of some masonic celebration.

Bartolozzi had a great regard for England, which, however, he quitted at a very late period of his life, at the age of seventy-five, on the invitation of the Prince Regent of Portugal, coupled with the promise of knighthood and a pension. Here, however, he seems to have worked just as hard, almost up to his death, at the age of eighty-eight, passing from the service of the Prince Regent to that of Napoleon. Whether from his habitual carelessness about money, or from other causes, he seems to have been in rather straitened circumstances towards the close of his life. He died at Lisbon on the 7th of March, 1815, and was buried in the church of Sta. Isabel in that city; but it appears that during the re-flooring and decorating of the church recently, his tombstone or monument was shifted from its place, and not found again, so that the record of his precise retiring-place is obliterated.

At the time when Bartolozzi settled in England, the fashion for stippled engraving was just becoming general, and also for the quasi-imitation of crayon by means for such stippled engravings printed in red. Bartolozzi made this stipple engraving ultimately his favourite style, and gave to it the utmost delicacy of modelling and finish, by his minute and carefully-graduated shading. Several beautiful specimens of this work are published in the volumes before us, from plates which have not been too much worn to show the delicacy of the original work. The contrasted heads of "A St. James's Beauty" and "A St. Giles's Beauty" from paintings by a now forgotten artist, Benwell, are absolutely perfect in their beautiful exhibition of texture, in the faces especially; we seem almost to see the colour on the cheeks of the two pretty young women. The great beauty of this form of engraving is that it gives the soft and graduated effect of chalk or pencil drawing on a moderately rough paper, together with a command over the most delicate gradations of shading, when the placing of every dot can be separately controlled, such as pencil can rarely and crayon never achieve with the same perfection of finish. Nor is the process unreasonably lengthy; Mr. Tuer, who has probably good opportunities of knowing, describes it as occupying about one-fourth the time required to produce the same amount and finish of work



in line engraving. At the same time, we hold that there are two sides to the matter. The effect of the stippled engravings is very soft and delicate, but it is less brilliant and powerful than that of good line-engraving, and the latter form of art has more of interest for the draughtsman, so much of the effect depending upon the delicate manipulation of curves and of graduated distances and spaces; the lines in line-engraving being, in fact, to a great extent contour curves, indicating the modelling of the surface intended to be conveyed, by their direction and change of curve, as well as by mere proportion of light and dark. Let any one study carefully the manipulation of the shading of a face, for instance, in a fine line-engraving, and he will probably come to the conclusion that this is the more refined and intellectual art of the two, though not so delicately pretty in its result.

One of Bartolozzi's letters printed here (there are not many in existence), addressed to his friend Colnaghi, and especially taken up with his recommendations in regard to the health and safety of a child in whom he had some interest (probably the daughter of a relation), who was under Colnaghi's care, gives an idea of his being a man of kindly and simple nature. Among his recorded expressions is that of his high opinion of Hogarth, of whom he said "he knows everything, he is a designer and painter; his prints are a theatre of human life, and if he had been born in Italy he would have been a great Italian"; which last praise conveys a good deal, considering in what light Bartolozzi, no doubt, regarded the land of the "Italian masters."

The chapters on various forms of engraving, and the nature of the processes employed in them, add a usefulness to the book, giving as much information on such points as amateurs in general wish to have, and such as increases the appreciation of the value of an impression and gives it a new interest in calling attention to the means whereby the effects are produced. The chapter on stipple engraving is illustrated by some specimens showing various methods of shading surfaces. Print-restoring, in its legitimate form, is a special accomplishment, consisting in transferring the upper surface of an old plate on to a new and stronger paper; and a chapter is devoted to it. In connexion with this part of the subject is mentioned the story of a wealthy amateur who, wishing for a head of a Madonna to put as a frontispiece for a book, bought a Müller's engraving of the Sistine Madonna at about 60*l.*, and then and there cut out the head, leaving the rest of the print, as he "did not want it." The mutilated print remained in a drawer in the dealer's shop for some years, when he heard of the sale of the purchaser's books, bought the one with the Madonna head in it for a trifling sum, and inlaid it into the print again so successfully that the treatment it had received would never have been suspected.

The reader is given, in the second volume, some practical information as to the nature of some of the frauds practised in making imitations of old prints or in cooking up for the modern market prints which have decayed; and one or two specimens are given of old stipple engravings, showing one half in its worn state from frequent impressions, and the other half as re-bitten to pass as an unworn original. A chapter on framing, no unimportant consideration in regard to the best setting off of a valuable print, has some sensible remarks; the author is in favour of plain and unostentatious framing, and inveighs rightly against the folly of cutting down the margins of old prints to get them into smaller frames, thereby spoiling their appearance and saleable value. The list of Bartolozzi's works, which occupies the larger part of the second volume, is interleaved with some blank ruled pages, for noting down any examples that may come to light which have been missed from this catalogue. The book as a whole is both an ornamental and an interesting one.

**Census of St. Petersburg.**—The result of the Census of St. Petersburg, taken on December 27, has been published. The total population is calculated at 861,900. The number of males is 475,000, or nearly 90,000 in excess of the females. This curious fact is due to the system of fixing peasant families on the land, and forcing those who seek the pursuit of industry in the capitals to leave their wives and daughters behind them. The last census was taken in 1869, and that now taken shows an increase of 29 per cent. above the figure of twelve years ago.

#### THE EARLIER PARTHENON: OCTASTYLE NOT HEXASTYLE.

The glories of the Athens of Pericles are so abundantly in evidence, and so dazzling, that attention is apt to be withdrawn from the scattered, but sufficient proofs of the importance of the city both in arts and arms in times anterior. The splendour of the remains of the poetry, sculpture, and architecture which date under this great administration, or immediately before and after it, is enhanced by the full glare of contemporary history, lighting up all the circumstances of the civilisation amidst which they were produced. When we would scrutinise the conditions of preceding epochs, we find that within the limits of a single lifetime, as we go back this broad light becomes an uncertain twilight, that is, ever deepening into utter darkness. Nevertheless, we can discern by the light,—if only the flickering light of tradition,—sufficient indications of certain earlier epochs of the importance of Athens, which gave forewarning of the more comprehensive greatness to come. Keeness of the historic sense is tested by accuracy in appreciating the traditions of the time when the sacred fire in the prytaneum of Athens was the centre from which colonists started to conquer territories and found cities on the coast of Asia Minor,—to constitute the future Ionia. After a considerable interval succeeded the age of the tyrants, who in various cities of Hellas gave no little attention to the development of the refinements of civilisation,—to architecture especially,—and so did much to qualify the mischief of their usurpations, if by no means to compensate for them. Pisistratus and his sons may be taken as the last and not the least distinguished of their class, but no stimulus which they gave to the arts was equal to the spirit that was awakened upon the final expulsion of their last survivor.

"Athens," says Herodotus, "had even previously been a great power, but after the expulsion of the tyrants became still greater," v. 66. He continues soon after in a tone of calmly-convicted enthusiasm, if the expression will be allowed; and those who know his style may not think it inappropriate,—"The Athenians accordingly now made a great advance; and not in one instance alone, but universally, may equality before the law avouch itself as a thing of energy and spirit; inasmuch as in the case of the Athenians also, so long as they were under tyrants they were in no way superior in war to any of their neighbours, but as soon as they got rid of their tyrants, took the lead; this fact, then, goes to prove that while they were in subjection, they malingered as being put to work by a master; but so soon as they were free, every one of them was zealous as exerting himself on his own behalf," v. 78. These sentences are no unworthy prologue to the outburst of political energy and poetic and artistic genius that speedily followed. One of the first results in Hellas of an interval of prosperity was the employment of treasure on the embellishment of the city and on monuments to dignify the national religion. That Athens was early and eager in such a movement is proved by the complimentary epithets of Pindar. Our own earliest material evidence of the fact consists in fragments of the temple which was superseded by the Parthenon of Pericles; they testify upon how considerable a scale his predecessors in power were prepared to indulge their ambition for architectural magnificence. These interesting remains are built into the exterior courses of the north wall of the Acropolis. We owe our knowledge of them to Mr. F. C. Penrose, who found and measured them while he was engaged on the survey of the Parthenon for the Society of Dilettanti; he devoted to them a plate in his "Principles of Athenian Architecture," and made an attempt to deduce the ground-plan of the building they had pertained to. They consist of twenty-six drums of columns, five of which, at least, are on a smaller scale, all of Pentelic marble; two groups of complete Doric entablatures, architrave, frieze, and cornice composed of Piræic stone, a magnesian limestone; and some marble fragments which seem to have formed part of the stylobate. No upper drum of a column, nor abacus, nor echinus of a capital is preserved, and we are thus left without assistance towards determining the height and general proportions of the column. Besides these fragments of superstructure, some further evidence is obtainable from the remains of the original substructure, which was utilised by extension for the later extended building; its limits are

identified by difference of work, and duly exhibited and described in Mr. Penrose's plates and text. The conclusions which Mr. Penrose rests in from the study of these remains are highly interesting, and up to a certain point carry conviction; at what important point we demur to following him, and how decisively his own plates enable us to certify a different restoration, will appear as we go on.

The majority of the drums are finished and fluted to a small height from the base, but otherwise remain somewhat rough cylinders. The larger examples have a uniform dimension of 6.233; the corresponding dimension in the existing Parthenon is 6.250. So close an approximation naturally suggests that they may be mere wasted drums rejected from the later building, such as have turned up among excavations on the Acropolis; but this is disproved, as Mr. Penrose shows, by comparison of the contours of the flutes; the cusps of these frusts, like those of the Theseum, have a sharp arris instead of the fillet of the existing Parthenon. The smaller frusts are 5.601 in diameter,—again a close agreement with the inner order of the Parthenon; 5.402 in the pronaos, and 5.632 in the posticum. Here the agreement is so absolute as to seem to challenge reconsideration; but, in truth, this is out of the question upon such grounds, for the height of the entablature, as taken from the fragments, agrees with that of the Parthenon quite as closely,—namely, 11.126 as against 11.092, yet the differences in detail are so absolute as to make it impossible that the fragments should have been rejected from the later structure, even had not the difference of material,—Piræic instead of Pentelic,—been decisive. There is nothing to surprise us in the union of the two materials. As the more easily worked and more accessible Piræic stone was in favour of cheapness,—a probable consideration in a structure of the extent which we shall see was contemplated, though it was not allowed weight by Pericles. Where ordinary limestone was used for columns, it was not unusual to coat them, as Vitruvius and Pausanias mention, and as remains testify, with a very fine stucco which simulated the smoothness of marble. Such an application may have been intended here; one cornice-stone, however, was found which was painted directly on the under surface.

Mr. Penrose entitles his plate, "Some Fragments of the Temple destroyed by Xerxes," but it may, perhaps, be doubted whether at the time the Persians, as recorded, burnt the temple of Athens Polias that housed the sacred olive-tree and serpent, the larger temple was very far advanced in course of erection; that all the drums of the columns found are lower drums, and those unfluted, gives at least a presumption that the work was not far advanced, however the design may have been completed and parts in preparation and progress. The Greeks had at first resolved to leave all the temples which the Persians had desecrated in their ruins, as if to maintain a permanent protest against the outrage in the eyes of gods and men; but it is evident that this purpose was very soon renounced. When the question arose how the Parthenon was to be dealt with,—whether it was half destroyed or half completed,—it is not to be wondered at, considering the daring and decisive stride that was made in every other art under the combined excitements of political triumph, and extended resources and general spirit of innovation and progress, if it was resolved to do away entirely with every trace of what had already become recognised,—so rapidly was the world moving on,—as architectural archaism. Of the archaism of the previous design there is patent proof. While the two entablature groups agree exactly in height and also in the breadth of their metopes, they differ in their breadths of triglyphs and mutules, and consequently in the lengths of their architrave stones,—the shorter average 12.50,—the longer 13.80. The difference of columniation which this implies in the same structure is what we find in the archaic temple of Corinth, as well as in other instances; in the Corinthian and Æginetan examples the flank columniation is somewhat closer than the front. But here the difference is given very decidedly the other way. The upper surface of the stones forming the cornice that pertains to the longer architrave is inclined to accommodate the slope of the roof tiles, while in the others it is a horizontal plane, as required to suit the front below a pediment; it thus appears that the columns were spaced more closely on the front than on the flank, and not only so, but



more closely than in any other instance in Western Greece.

We come now to the question whether this older design was a hexastyle or an octastyle temple; Mr. Penrose, following the conjectures of Colonel Leake too deferentially, has no hesitation in declaring for a hexastyle. Professor Strack is as decidedly for an octastyle temple, and has no difficulty in making it fit into the limits given by the plan of the substructure upon which it must be said the hexastyle of Mr. Penrose sits but loosely with an unexplained liberality of margin. The record of Hesyohus comes here into consideration; it is a brief notice that the Athenians and Pericles added 50 ft. to the earlier Parthenon,—the hecatompedon; Penrose accordingly deducts 50 ft. from the length of the building as it stands, and finds that a flank of fourteen columns, as in the hexastyle temple of Neptune at Paestum would fit the remainder with the difference of a single foot. Strack, on the other hand, gives a flank of sixteen columns to his octastyle temple, and assumes that the additional 50 ft. given to the new temple had no direct reference to the full length of the building measured on the stylobate, but was an extension of the *cella* beyond the proper hecatompedon naos,—that it, in fact, expresses the precise 50 ft. of the opisthodomus, an apartment which he therefore assumes did not exist in the earlier building. This temple, of course, fits the breadth of the substructure as exactly as the new, and leaves no more margin to the front than is consistent for the dignity of the approach.

We have here conjecture for conjecture, and we confess that of the two our leaning, in view of the argument even so far advanced, is very decidedly to the octastyle design, with its general implications. But what is now to be pointed out is this, that upon accurate consideration of our opportunities for forming an opinion, we are under no obligation to rest content with mere preferences and probabilities. Mr. Penrose's plate 40 exhibits four of the shorter architrave stones which we have seen belonged to a front, in accurate juxtaposition, but in every instance having only semigutta-tablets at either extremity; not one of them, therefore, is an architrave stone adapted for the extreme angle where it must necessarily finish with a complete tablet, to answer to the triglyph at the exact angle of the frieze above. But of the five architrave stones, and no more, which are applicable to a hexastyle portico, only three would be required similar to the examples of the engraved group of four, and the excess, therefore, casts us at once upon the alternative octastyle arrangement.

The average breadth of the shorter architrave stones is 12.490; the dimension,  $12.490 \times 7 = 87.360 + 1$  triglyph,  $2.490 = 89.850$  for full length of the architrave of the portico.

If we take the difference in favour of the breadth of the top step as compared with the architrave at 1 ft., we obtain 90.850 for the breadth of the stylobate; and adding to this 9.30, the sum of the projection of the steps of the present Parthenon at either end, we obtain,—100.150,—more or less, within very moderate limits, for the estimated full breadth to compare with 114.325 of the later Parthenon.

As the full breadth of the ancient substructure is 104.225, this estimate is perfectly consistent with it, and probably not far wrong.

The length of the older portion of the substructure is 231.40, but we cannot make this a direct basis for calculating the length of the original design. It may have extended further originally, and even as it is may advance beyond the limits of the ancient lowest step, as, indeed, it is carried forward by additions as far as 14 ft. beyond the lowest step of the later Parthenon.

It is, fair, however, to indulge in a conjecture,—always under due caution, and with warning given.

Assuming sixteen columns for the flank, we have this result:—

Average longer architrave stone, $13.301 \times 15 = 199.50$	
Add for two semi-triglyphs.....	2.72
Length of flank architrave.....	202.22
Difference of top step.....	1.00
Add for projection of steps.....	9.30
Conjectural length of lowest step.....	212.52

This would leave some 19 ft. for platform in front of the temple as against the later 14 ft. as above.

There seems an indowment, therefore, to revise our conjecture, and add one more column to the flank; we so obtain  $212.52 + 13.301 = 225.821$

full length to compare with full breadth on lowest step 100.150.

These dimensions at once declare themselves to the eye as so nearly in the ratio 4 : 9,—a double square and a quarter,—that we do not hesitate to take our stand upon them, always conjecturally.

$$4 : 9 :: 100.15 : 225.83, \text{ to compare with } 225.82.$$

This, at least, gives us another coincidence with the Parthenon of Pericles, of which the top step has this proportion most accurately; in the Theasem the proportion is established as in the preceding instance, on the lowest step.

Those, however, who have had most experience in numerical comparisons involving some uncertified elements will be most on their guard against the delusiveness of coincidences which seem to delight to waylay the theorist with tempting confirmations of a foregone theory, only to turn out mere accidents at last when corrected dimensions may become available. Let us turn resolutely aside, therefore, from speculations as to the proportions of column and capital which the analogy of better preserved archaic temples might seem to justify, and be content to take note of what positive characteristics are before us. The most conspicuous of these is the exceptionally-close spacing of the columns of the porticoes. The interval between column and column,—the free inter-column,—does not exceed the diameter of the column by more than 0.01; that is, may be taken as absolutely equal to it. The columns of the flank were spaced more widely, but even here the difference in favour of the inter-column was barely 1 ft., whereas in the Parthenon of Pericles, with columns of the very same diameter, an excess of 2 ft. was given in favour of the intercolumn on plan. Still more pygmaistic would be the arrangement by the angles where the outer columns were centred, not with the centre line of a triglyph, but with that of its inner profile. This would reduce the angle intercolumn on the front to about 5.022, actually 1.20 ft. less than the diameter of the column, and the columniation, or distance from centre to centre of columns, to 11.255. Allowance made for uncertainty as to preciseness of this dimension, it may be taken as coincident with the height of the entablature 11.125 which may, probably enough, have been decided with reference to it. However this may be, the ponderousness and indeed, clumsiness of such proportions is self-evidence. In Sicilian Doric we meet with entablatures of vertical dimensions, not simply equal to breadth of shortest columniation, as in the Old Parthenon, but even exceeding it; whereas as in the comparatively archaic temple of Ægina, there is the difference of a foot in favour of columniation, and in the later Parthenon somewhat more. In this heaviness of entablature there is, doubtless, consistency of principle with the excessive stoutness of the columns relatively to their interval; but in both respects, as well as in the great difference in the spacing of front and flank columns, we recognise crudeness of style beyond what is found in the temple at Ægina, which otherwise retains so many archaic characteristics.

Now, since it appears probable that the older Parthenon was still in process of construction when the Persians overthrew and desecrated the sacred structures of the Acropolis of Athens, it seems a plausible inference from the more advanced style of the Æginetan temple so close at hand, that this was erected after the defeat of Xerxes, in which the Æginetans took so glorious a part. We are, of course, wandering into conjecture again, but there is no conjecture in the assumption that the architects of Pericles were familiar with the numerous Doric temples already erected, and had studied them,—full-sized models,—with scrutinising eye, for the discovery of the secrets of their impressive dignity or the drawbacks upon it. As certain it is that they were not the first such students; that many predecessors had tried the effect of new variations, and with varying taste and judgment had sometimes pressed still further, and sometimes qualified antecedent innovations.

But what these remains of the old Parthenon alone suffice to make quite clear is this, that Doric architecture was brought to perfection in the fifth century B.C. by skill applied to quantitative adjustments, if we may so speak, not to qualitative. All the essential members and details and their general dependence on each other had already been established on the basis of the soundest structural logic; we have no sufficient monumental evidence of gradual

development of the system to preclude the possibility that it may not have been, in the main, the invention of a single man of genius, and if so, of what genius? But still the true secret of the limiting proportions remained to be divined,—divined by a genius not inferior to the first. It would be an exaggeration to say that a comparison of the remains of the old Parthenon, or the temple at Ægina with the Doric architecture of Ictinus, is equivalent to a comparison of the skeletons of man and a gorilla; and yet are such comparisons in principle the same. Setting out of sight the consideration that the structure of the anthropoid is, in fact, as admirably adapted for its purposes and destiny as that of man, we may take it as a type that answers to that of man, bone for bone, throughout, in general purpose and position, and which,—other things being equal,—an extravagant supposition, no doubt, may be raised to the more elevated type by mere changes of proportion, with no alteration of elementary purpose. It is by changes of this nature, but far more moderate in degree that the entablature of the old Parthenon re-appears as that of Ictinus. The triglyph becomes much broader. The lighter and taller looking triglyph of the older design would certainly have had an effect very glaringly out of harmony with the general heavy proportions, but the squareness of the metope was apparently a fixed rule and the contraction of space for the triglyph was a necessary consequence. It was by operation of this rule that the flank triglyphs were broader, as more space was allowed by the wider columniation.

Other distributions were open to the arbitrament of taste and judgment. We observe that Ictinus reduced the thickness,—measured vertically,—of the gutta tablet, and approximated it to that of the architrave band, which he also reduced; the same treatment awaited the abacus of the triglyph moderately, and more decidedly of the mutules and the lower division of the cornice, and the projection of the gutta, which are also simplified in profile. By these adjustments the lower mouldings of the cornice contrasted more decisively with the adjacent crowning members of triglyph and metope, and at the same time favoured the predominance and enhanced the expression of the broad vertical face of the cornice between the upper and lower drip moulding. Professor Strack takes a very different view of the good sense and good taste of these changes. After praising them in review in detail, but only considering each as a detached detail, "it thus becomes evident," he says, "that the architectonic members of the earlier building were designed with more decision and distinctness, that they had a more characteristic impress, and that the Parthenon of Pericles was by no means a higher development of the Doric style, but even exhibits a weakening of individual forms."—*Arch. Zeits.*, 1859, p. 245. This is a judgment which exemplifies expressively an essential conflict of Tonic and Hellenic sensibility to refinement. Very different, indeed, is our own conclusion, after carrying through the same comparison, and having regard also to the relation of the Parthenon of Pericles to other Doric buildings that can be brought within a century of its date either way. Such a review enhances our sense of the marvellous outburst of genius in the age of Pericles by making it evident by how astonishing a leap it was that architecture leaped at once from the empirical, and the tentative, and the timid, to the accomplishment of a work which brought the struggling suggestions and efforts of ages into ultimate,—into absolute,—harmony at the command of self-reliant genius. In the culmination of Greek sculpture in the same age alone, does the history of the world, so far as recorded, afford a parallel to such sudden, secure, and unrivalled development of our art.

#### Civil and Mechanical Engineers' Society.

At a general meeting of the members of this Society, on the 5th inst., the President (Mr. C. T. Walmisley, A.K.C.) in the chair, Mr. W. C. Street, the hon. treasurer of the Society, presented his annual account. The hon. sec., Mr. G. A. Fryer Cusson, said that during the year there had been a considerable increase to the roll of membership, and he hoped that during the present year the roll would be very much increased. The report having been adopted, the chairman then read a paper by Mr. James Love, on "Differential Tides."



## ON THE USE OF SLATE-PENCIL IN CARVING MARBLE.

As no notice seems ever to have appeared of the use of slate-pencil as an aid and guide in the progress of working a statue in marble, a few words on this subject may be of service.

Its usefulness arises from the fact that the tint of lines and shading made with it on the marble bears extremely close resemblance to that of the shadows produced by actual cuttings; thus, by this means, enabling the sculptor to see the effect of what he proposes to do. In this fashion, tentatively, with the slate-pencil he can sketch on his marble in progress the further forms and refinements he would introduce, which afterwards he can carry out, as far as he approves, by following them in actual execution, thereby escaping the peril of a too free use of his chisel in the first instance.

In an oil-painting, if an error be made, the colour may be altered or removed, and the requisite variation introduced; but marble once out away cannot be restored, and the deficiency admits of no satisfactory remedy. Therefore, any method which will enable the sculptor to escape this danger by affording him the opportunity of previously testing the effect of what he proposes, without actually cutting it in, may well be thought worthy of consideration.

The forcible markings of lead-pencil or black chalk, which are so much more powerful than the shadows of marble, and different in tone, while they are appropriately used by the master-sculptor to indicate to his workmen distinctly on the marble what he wants done, are, on that very account, unsuitable to imitate and test the effect of proposed cuttings. Also the markings made with these materials are more permanent than those of slate-pencil, and thus also perhaps more fitting for the direction of assistants. But, on the other hand, when the service sought is tentative, then even the easy brushing away of the slate-pencil marks is convenient as they thus may be the more readily altered until the effect desired is obtained. This quality, combined with the special and far more important advantage of the tint of slate-pencil on marble so exactly counterfeiting its shadows, may well recommend it to the sculptor in making preliminary tests of the further details he seeks to introduce in his work when it has come into his own hands from those of his assistants.

It may be assumed that every sculptor who is possessed by a true devotion to his art will, in degree at least, work on his own marble statue,—at any rate, towards its completion. In some cases, indeed, if he be an enthusiast, he may take up his chisel at an earlier stage, to shape out his work from the block without direct reference to any previous model, as seems to have been the occasional practice of Michelangelo. This, however, may well be rare in this age, in which portraiture forms the staple of employment; to which branch, as accurate resemblance is the chief aim sought, this method is not applicable. It is in poetic and epic sculpture rather than this somewhat hazardous mode of independent carving may occasionally be adopted, which offers an example in which the tentative use of slate-pencil becomes of marked advantage. If pioneers and denotes the way for the chisel to advance, and acts like a cautious guide to avert a possible catastrophe; as a headless, ill-considered, or impatient stroke with the hammer and chisel may at any time during the progress of a statue sadly prejudice its future.

Even, however, when a careful previous working model has been prepared, and it has been carefully pointed into the marble, and the statue has been duly and correctly forwarded by the sculptor's assistants, much remains to be done when the sculptor himself takes it in hand. At this stage there may be many parts to modify and complete; and in effecting this, peril may be avoided and accuracy gained, by means of the above described tentative employment of the slate-pencil. With this in hand, it is evident that each proposed touch of form and character may be readily tested over and over again with any variations that suggest themselves, and with the utmost freedom, before the chisel comes in to fix it for ever.

There is another respect in which the gentle grey of the slate-pencil, in counterfeiting so closely the tender quality of the delicate shadows of the best statuary marble, may be of great practical advantage. This is quite distinct from that which has been described above, inasmuch as, instead of being anticipatory of what may be about to be done, it illustrates what has

already been done, by more clearly displaying the state the work has already arrived at in some of its obscure parts, and thus affording guidance to their further completion, as follows.

In the essential sinkings and deep cuttings in a marble statue,—as, for instance, in the openings of the mouth and nostrils,—in consequence of the semi-transparent quality of the material, the exact distance to which the working has penetrated, and the precise shape of the orifice which the tool has fashioned, may not probably be clearly distinguishable. Nevertheless, to enable the working of these parts to proceed safely, these joints should be clearly ascertained. Thus at this stage a very finely-pointed slate-pencil comes in with its useful aid. Held between the fingers freely and lightly, if its point be directed to explore about, and by this means be rubbed gently around the interior of the orifice, it gauges and makes out, and marks and elucidates its form with distinctness, showing clearly thereby how much or how little has been done, and brings to light any irregularity and imperfection that may exist in it. This insight having been thus obtained, the tool enters again, and corrects these aberrations, and proceeds with the form a little further, having in its course worked away all the slate-pencil marks. And thus, in continuation, may the slate-pencil and the tool alternately work beneficially in such orifices and sinkings in the marble, until at last the markings of the slate-pencil show that their due shape has been completed.

No use of candle, or lamp, or gas, or inclining of the figure so as to catch the light of day from beneath, although all these methods are applicable and useful on occasion, is so safe in finishing these apertures as the above mode, as it presents the effect of the completed form in that light and in those views in which the statue is to be eventually contemplated, and this in the simplest manner.

It may be further remarked, in reference generally to the art of carving statues in marble, that one of the chief considerations to be held in view is the keeping of the work as broad as possible in treatment and effect throughout all its periods of advancement. More especially is this of importance in the earlier stages of its workmanship, so that the sinkings and cuttings should be kept delicate, so as not to compromise or fetter the afterwork, leaving the forcible touches and deep shadows to the last.

In accordance with this principle, and with the aid of the slate-pencil, the nostrils and the openings of the mouth and of the ears may be marked in at first wholly without cutting them in with the chisel, or following them out at all in the first instance; and a trial in defining them and putting their shadows in with slate-pencil will show at once how closely it is capable of imitating and producing on a comparatively plain surface the effect of the forms and shadows which are contemplated. The same consideration applies to the delicate but compromising lines which define the wings of the nose against the cheek, and those around the eyes, on which so much depends their expression; also the temporary putting in of the irides and pupils of the eyes with slate-pencil may be found an assistance in illustrating the due form and size of the eyes, in comparing them with nature, and in guiding their completion, although no actual indication and piercing in of these irides and sights in the marble itself be contemplated by the artist, as, indeed, not being a treatment of these features in harmony with the highest class of sculpture.

Altogether the safety to the work in hand arising from the tentative employment of slate-pencil may be the more evident in consequence of the dangerous proclivity of some carvers in marble towards emphasising, prematurely, deep sinkings and orifices with the impatient yearning to produce effect, which, indeed, is a very embarrassing "boasting sin" with those who are too confident; and in this respect a more modest and patient mode of execution on the part of the master sculptor may, while doing the best for his work, set a good example to those he employs.

With one more instance of the advantage of the use of slate-pencil in the carving of a marble statue, these remarks may conclude. This is in respect to the definition of the nails of the hands and feet. This can, in the first instance, be done perfectly, without cutting them in, but merely by means of lines carefully drawn with a finely-pointed slate-pencil; leaving the actual incision of them with the chisel until nearly the last finish. At any period, even when the statue

is finished, these lines should be treated delicately, for a too forcible marking out of the nails is contrary to refined beauty. Nevertheless, of course, they should be distinct; but until their exact situation is definitely manifested by means of the completion of the forms and lengths of the fingers and toes, it is hazardous to actually cut them in. In the meantime, during the progress of the work, their effect may be successfully rendered and applied by means of the above-mentioned fine lines of the slate-pencil, leaving to the last stage of finish the actual incising of them with the tool, which, when their situations are definitely fixed, is but the work of a very short time.

Examples might be given of many other parts of the form of a statue, in the working of which a similar preliminary use of the slate-pencil might be shown to be of almost equal advantage. If, however, the spirit and suggestions of these remarks be accepted as just and useful in respect to the benefit which may arise from the employment of a material for sketching on marble, which so closely counterfeits the tint of its shadows, those who entertain them will apply it according to their own requirements and taste, whatever may be the nature of the works on which they are employed.

It may be added that these remarks, as probably may be gathered from their nature, are not speculative, but the result of actual and long practice.

## THE PROTESTANT CEMETERY AT ROME.

In a few days' time the quiet Protestant burial-ground of Rome will be the scene of an interesting ceremony. In the sympathetic presence of Lord Houghton, lover of art and letters, the remains of the late Joseph Severn are to be removed and laid beside those of his friend, the poet Keats, to his connexion with whom Severn owes not a little of that just respect with which his memory is still by many cherished. It is exactly sixty years since the young poet was borne from his house in the Piazza di Spagna to his last resting-place, through the streets of the classic city beloved so well, along the quiet road that leads out of Rome to Ostia by the Porta S. Paolo and to the little plot of ground that in those days of Papal power had been given to the Protestants just inside the walls of the Eternal City. Short of a visit like that of Lord Spencer, who during a year's stay in Rome devoted his sole attention, without seeing even St. Peter's or the Coliseum, to the search after the original edition of Martial of 1473,—rare bibliographical gem,—with which, when found, he immediately posted back home in joy; short of a visit like that of the late Sir William Jackson, the great railway contractor, who, arriving in Rome for the first time late at night, obtained a business interview with Cardinal Antonelli, and left Rome early the following morning; short, again, of a visit to Italy in the modern tourist style,—Rome in so many days according to the tariff,—we can scarcely imagine any English visitor to the banks of the Tiber neglecting to pass at least outside the little Protestant cemetery.

It is under the shadow of the city walls, guarded by tall stately cypresses, and the pyramid of Caisa Cestia, at the foot almost of Monte Testaccio, and within but a few yards of the Porta San Paolo, on the road leading out to the interesting basilica of San Paolo, "outside the walls," familiar as much to those who have never, as it is to those who have often, visited Italy. Here in this little plot of ground have been laid within this century not a few of the English exiles from home who formed in the Rome of a generation ago the pleasant English colony. With Keats lies Shelley, and with them the son of Goethe, and with these true gentle artists lies John Gibson, so long the centre of that society of English artists which met at the Caffè Greco and the now defunct "Lepri," which, before Rome became the capital of united Italy, when tramways and daily journals were unknown, carried out the romantic ideal of existence in the city of the Caesars and the popes, of Raffaele's and Michelangelo's triumphs. Then, there was no Protestant church within Rome; as many will remember, it was outside the Porta del Popolo. Times are somewhat changed when, of the late Mr. Street's Protestant churches in Rome, one was long since opened, and the other is slowly advancing to completion. Those were the days when, in the stay of the stranger in Rome, not as in the present and hurried visit, it became a pious duty



to spend at least an afternoon in the quiet burial-ground near Monte Testaccio, whose name, in spite of the actual insignificance of the artificial hillock,—Primrose-hill is a Mont Blanc to Monte Testaccio,—has always possessed with the stranger in Rome a peculiar fascination; and when the pleasant drive was recommended,—all is vanity in Rome without a carriage, said, 200 years ago, Cardinal Borromeo,—there was always ample to repay the pleasant afternoon spent: passing, for sure, the Forum (not then excavated, as it is now) and the Coliseum (not scraped of its verdure, nor dug down as now), and turning off by the Palace of the Cæsars and the Arch of Constantine, down the Via di S. Gregorio (was it not?), and the dusty, narrow road to the Porta San Paolo. There, a little to the right of the gate, was to be found the custodian of the cemetery, who showed visitors over the ground, as he still does, of course.

There will be many visitors on the occasion we have alluded to, and which has led us into this brief reminiscence.

#### THE HILL FORESTS OF FRANCE.

THE protection of forests in France, and especially those that flourish on the slopes of the mountain ranges, is a question to which much attention has been paid of late years; and it is one of so much importance to the country in several ways, that a short *resumé* of what has been written and done concerning it may prove of some interest to the readers of the *Builder*. Apart from the loss to the State caused by the want of supervision of the timber, a much greater element of danger has been notoriously on the increase, arising chiefly from this neglect, viz., the danger of floods and inundations. These act in three ways:—First, by a large body of water accumulating with great rapidity at a given point; second, the force with which this water descends, tearing up the soil and carrying all before it; and third, the enormous amount of *débris* which is thus brought down into the plain, carrying destruction to life and limb, and ruining the land which has been thus visited. In the aggregate, the damage caused by these mountain overflows is exceedingly heavy, and there can be no doubt but that its increase may be directly traced to the decreasing care that has been taken of the forests. The Senate has recognised the gravity of the fact, and has in the last two budgets voted a supplementary grant of a million francs with a view to inquiring into and remedying the evil. The first who called attention to the increasing destructiveness of floods in the hill districts was an engineer of the name of Sirell, who in 1842 wrote a book called "L'Étude sur les Torrents des Hautes Alpes." In this he pointed out very forcibly that the mountain soil depended for its existence on the surface being more or less clothed with vegetation. Legislation, however, was not attracted to this direction until 1864, when two laws were passed with the special aim of mountain forest conservation. There is no doubt but that the earlier inhabitants of France were duly alive to the importance of their woods and forests, although, perhaps, for reasons which do not exist nowadays, such as the sacred character of the woods and groves which characterised the land of Old Gaul. In the time of Philip Augustus, Francis I., and Charles IX., much attention was paid to them, the value of the timber being the great incentive; while during the reign of Henry IV. and Louis XIV. the whole forest system was carefully revised and made the subject of a complete code. After the Revolution, the forests were so neglected that, large as they were, they would soon have disappeared altogether, had not their alarming condition opened the eyes of the authorities. The Nancy School of Forestry was established in 1824, and a new code of forest laws passed in 1827, which has been successively followed by the laws of 1860 and 1864, dealing more particularly with the re-wooding of districts in which the timber was disappearing. The present forest land of France (including Corsica) occupies about twenty-two million acres, or a sixth of the whole French area, not counting Algeria or the colonies. But a very considerable portion of this forest surface exists only in maps, and the consequence of the decay of the woods is observable in two ways,—one, the increase of, and annual cost caused by inundations; the second, the constantly increasing import of timber on the part of France, who ought by good

right to be able to supply herself from her own resources. The value of the fir and oak wood imported from Scandinavia and America into France amounts to 230 millions of francs. The districts in which the greatest amount of mischief has been observed is in the mountainous country of the centre and the south. Historical documents frequently make mention of forests clothing different ranges, which at present have disappeared, although their former growth is made evident by the remains of the timber of large trees buried in bogs or washed out of the water-courses. In the Pyrenees, in particular, such waste and want of care was shown, that whole communes have been obliged to migrate in consequence of not being able to obtain any fuel; and one of the chief reasons to which this destruction was attributed was the increase of pasture land for the flocks and herds, who were turned loose and allowed to commit what havoc they chose. In all these southern forests, laws existed, but there was no one to see them enforced; but, in the north, the seigniorial right was more jealously guarded, and the good results are seen in the better preservation of the woods and forests. It is, then, in the Alpine and Pyrenees chains, that the lamentable results are so conspicuous, and there can be no doubt as to the cause. Physical observers in these regions have noticed that those torrents which are plainly most recent in their formation are to be found in those districts which show, from physical as well as documentary evidence, that they were the seats of large forests.

A diligent inquirer into these old documents and surveys, A. M. de Ribbe, states that a comparison of the cadastral surveys of the fifteenth and eighteenth centuries shows that Haute Provence has lost half her cultivated soil, justifying the old saying that she has neither land nor inhabitants. M. Sirell, too, tells us that the inhabitants of the village of Lautaret were obliged, for want of wood, to burn dried cow-dung, and that before long the houses, clothes, and people were so disagreeably tainted that the village became deserted. It is not only the immediate neighbourhood of the mountains, moreover, in which these dangers are felt. There is a noteworthy increase of late years in the floods of the large, navigable rivers, such as the Garonne, Adur, Tarn, and many others, and these floods are greatly influenced by the causes which have been mentioned. A forest acts both mechanically and hydrographically; in the former case, by preventing any large body of water from collecting, and acting as a sort of permanent flood-gate; in the latter, by the trees themselves absorbing and exhaling a great quantity of moisture. By destroying the forests, the whole drainage of the mountain side is altered, and, in fact, destroyed also, with the disagreeable result that it pours down in unbroken volume and with unchecked speed to run riot in the plain. In point of fact, the question, is a country like France, is a very large one, and no expense ought to be spared to neutralise the evils of long years of neglect. The hill ranges should be carefully planted with well-considered zones; particular attention should be paid to the banks of the torrents, and more especially the recent ones; while, where necessary, extra protection should be given in the shape of walling, fascines, palisades, and other engineering devices.

#### INSTITUTION OF CIVIL ENGINEERS.

##### THE ADDRESS OF THE PRESIDENT.

It is a significant and not altogether a reassuring fact that the sixty-third anniversary of the Institution of Civil Engineers should be distinguished by an address of which the subject is almost wholly military; and not only so, but rather devoted to the studies of the artilleryist than to those of the military engineer. Not that we are in any way disposed to cavil at the luminous, judicious, and patriotic address of Sir W. G. Armstrong. On the contrary, we consider it a contribution of no little value to the higher education of the day. We rejoice to see the chair of Telford occupied by one who has done so much in the service of his fellow men as the present President of the Institution, and we are sure that had Sir William been induced to devote the occasion to the customary review of the ordinary field of labour of the civil engineer, both the Institution and the public would have been the losers. None the less it is noteworthy that, thirty years after the opening of that series of international exhibitions which were to usher in an era of unbroken

peace, the talk of the president of an institution which, in its objects as well as its name, is essentially civil, should be of forts and warships, and shields and guns.

"It may be fully admitted," to echo the language of Sir W. Armstrong, "that the general amelioration of the material world is the noblest object of our science; and if men and nations ceased to be bellicose and rapacious, such would naturally be the direction which all engineering practice would take." But at no previous time have there been instances of more unprovoked or more destructive wars, regard being paid to their duration, than have raged in each hemisphere since the erection of the Crystal Palace. "War indemnities have degenerated into mere exactions proportioned to the wealth of the vanquished, and England, being the richest of nations, offers the highest premium for successful attack." No country is so vulnerable, if not directly at her heart, yet in the endless ramifications of her territorial, maritime, and commercial organisation. We carry on more than half the carrying trade of the world. "We have seen what ravages a single armed ship could inflict upon a mercantile navy incomparably smaller than our own; and in our case it is not only property, but indispensable food that is at stake. We have the stern fact before us that national defence is in our case peculiarly a necessity." And those men will do good service to the country who endeavour, like Sir William Armstrong, to awaken those who hug themselves in a fool's paradise by an authoritative statement of the controlling facts of our national need, our national danger, and our national duty.

#### CONDITIONS IN CONTRACTS.

##### THE NEW VESTRY OFFICES FOR WESTMINSTER.

A PARAGRAPH has appeared in some of the daily papers imputing to the Central Association of Master Builders an attempt to coerce builders from tendering for the erection of the new vestry offices for the parishes of St. Margaret and St. John, Westminster. Some few months ago the Vestry accepted the lowest of a number of tenders which had been submitted to them for the erection of the offices, but subsequently the builder tendering refused to sign the contract on the ground that he and the Master Builders' Association objected, amongst other things, to the terms upon which payment was to be made according to the stipulations contained in the notice inviting tenders. The Vestry having advertised for new tenders, a letter, headed by a copy of the advertisement as it appeared in the *Builder* of the 31st of December last, was sent out by the Association, calling the attention of all the members of that Association to the circumstance that the clauses and conditions insisted on were opposed to those usually adopted.

We have before us a copy of the letter referred to. There is not a word in it to warrant its being styled "an attempt at coercion." The following statement of facts in regard to the matter has been furnished to us by Mr. Henshaw, the Secretary of the Association:—

"On the 26th of September last, the Vestry received tenders varying from about 24,500*l.* to 21,377*l.* for the erection of new parochial offices. In the preliminaries it was there provided,—'The general conditions will be those adopted by the Institute of British Architects and Builders' Associations.' The solicitor to the Vestry seemed to be unaware of this preliminary, and prepared a form of contract which the accepted builder refused to sign, as being unjust and arbitrary, and contrary to the above-named conditions. A very long and tedious correspondence ensued between the respective solicitors, and at last the Vestry, getting tired of waiting, decided to go to a new public competition. They have, it is true, received sixteen tenders from country and other builders of a rather wild description, varying from 29,800*l.* to 21,350*l.*, which latter is from an Edinburgh firm (McGregor & Co.), who are building the new hotel in Victoria-street, for the Army and Navy Company. As regards the Vestry, the result is that there has been a loss of about four months' time and a slight advance of 200*l.* in the lowest tenders, and a Scotch builder will be employed instead of a London builder. The contract now required by the Vestry differs widely from that put forward in the first place, which circumstance is a complete justification of the opposition made to it by the London builders. The Master Builders' Association thought it right to call the attention of their members to the circumstance; but the statement that any attempt at coercion was made is as silly as untrue."



## DRY WALLS.

DR. MAX VON PETTENKOFER, in a lecture delivered on March 23, 1872, before the Albertverein at Dresden, on the examination of the dryness of walls, said:—"Hitherto the decision of experts, without regard to the age of the building, has been dependent for the greater part upon the so-called 'practical eye,' consequently upon subjective judgment, there being no sharp distinctions. It is well known what is the value of the optical demonstration of the dampness of wet spots; everything may appear dry and be still very damp. Feeling walls with the hand, whether the touch conveys a sense of cold or warmth, is also only a very arbitrary estimate, as much as knocking walls with a key or a small hammer. . . . The only safe means would be to ascertain what quantities of water are communicated within a stated period in various rooms to air not yet saturated with vapour."

This is the theme upon which Herr Carlo Boog proceeds to base a very able and thoroughly practical paper which appears in the *Wochen-schrift* of the Association of Austrian Engineers and Architects. Herr Boog says that, although, since that lecture was delivered by Pettenkofer, almost a decade has passed, hygiene as an independent science has taken deep root, and the axioms above quoted have become the common property of all bodies to whom the care of the public health has been confided, it might have been thought that at present the examination of the inhabitalness of new houses would proceed exclusively on scientific grounds, and that "arbitrary subjective judgment" would by this time have become a stage which we had fortunately surmounted. But this is not so. Notwithstanding that we write 1881, at Vienna and throughout the provinces of the Austrian Empire, the grant of the official certificate for new houses and the examination of freshly-built walls with regard to their dryness still proceed upon the principle of the "practical eye" of sanitary authorities. In the most favourable case, any key at hand forms the only "scientific," but at once harmless and useless, instrument for tapping at the walls on the occasion of the official inspection. The present mode of giving certificates for new houses, without any criterion that will bear the test, must be described as absolutely unpardonable, and is to be severely blamed, because new buildings are annually passed as fit for habitation the use of which is highly injurious to health, on account of the latent dampness which they contain. Of course, in no statistics of sickness will be found such cases of illness, for although the inhabitants of a new house are subsequently stricken down by disease, the causes of which must doubtless be sought in the insufficient dryness of new walls, the dampness of the dwelling must not be the cause of sickness, and, apparently, for a very good reason, because the house in question was pronounced by official experts as dry and fit for habitation. No one will presuppose those experts to be possessed of so much self-denial as to expect a spontaneous disavowal of a certificate once given.

We will not stay to examine how much of the censure pronounced above deserves to be applied beyond the frontiers of the Austrian empire, and much nearer home, but will proceed at once to the consideration of what might be done in the direction by scientific means. We cannot believe that, in our days, there could be a want of suitable expedients for establishing the degree of dryness of a new wall with scientific exactness, no more than that we should like to be responsible for the sufficient reliability of any "practical eye," however trained. But let us come to the point. Let us turn away from matters as they are now, and try to demonstrate how they might be under a better safeguarding of the public interest. We do not propose, by any means, to advance novelties, for in that case the continuance of the practice of the present day would be as good as confirmed. We confine ourselves to point out how, elsewhere, for many years, this examination of the hygrometric state of new walls, a matter of no small importance to sanitation, has been practised with punctilious care and by the aid of highly reliable instruments.

As Pettenkofer remarked, a safe estimate of the inhabitalness of newly-erected dwellings can only be formed by accurately measuring the quantities of water which are given off within a prescribed time in different rooms to an atmosphere not yet saturated with vapour.

Various practical methods of investigation have actually been defined, with due regard to the above proposition. We desire to draw special attention to such an experimental method, which is practised at the present time by the sanitary authorities of most Italian cities, and which has been successfully followed by the municipality of Rome for about fifteen years. This investigation was proposed at the time by Professor Ratti, of that city, its principle consisting in shutting off the air in the room to be examined for twenty-four hours, in order afterwards to determine its hygrometric state.\* For this purpose,—if the house to be examined is finished so far as to be ready for occupation,—fine dry days are chosen, and, if possible, those on which northerly winds prevail. The several dwellings are shut off room by room, and as perfectly as possible from the outside air. After twenty-four (or, better still, forty-eight) hours, the air is examined, care being taken to close the several doors as quickly as possible after entrance in a room, in order to hinder a change of the state of the shut-off atmosphere by the outer air.

The examination of each separate room by itself takes place with a steady regard of the fact that in each its own shut-off air should be preserved unchanged. After obtaining the hygrometric state, or determining the proportional number of saturation of the air of the several rooms, there remains to ascertain what is the proportional number which prohibits occupation of a room. The determination of this proportional number was the principal difficulty which opposed itself to the practical adoption of the method of examination proposed by Professor Ratti, and very numerous experiments were required to fix it. By continually and repeatedly comparing air shut off in very old and undoubtedly dry rooms with such as had been examined in obviously damp spaces, Ratti came to the conclusion that, if the quantity 0.75 resulted as the hygrometric proportional number of an atmosphere, the space giving such an aggregate must be declared uninhabitable, and the certificate of occupation refused, because the walls have not yet been sufficiently dried.† It will not appear quite superfluous, before continuing our investigation, to remind our readers of the meaning of the hygrometric proportional number. A volume of air may contain, at a certain temperature, various quantities by weight of vapour, but which do not exceed a certain limit; if the air contains the maximum of vapour which it is possible to absorb at a given temperature, it is said to be saturated, this maximum weight of vapour varying according to the temperature of the air.‡

From the above it will be seen that by the hygrometric proportional number is understood the proportion of that quantity of vapour which is actually contained in a given volume of air at a given temperature to that maximum quantity of vapour which would saturate the same volume of air at the same temperature. As now, at an equality of temperature and volume respectively, the quantity of vapour shut off in a space is exactly proportional to the tension of the vapour, the expression of quantity or of weight in the above hygrometric proportion is replaced by that of tension. If  $s$  is the tension of the vapour contained in a space, and  $S$  the tension of the vapour which would saturate the same air-space at the same temperature, the hygrometric proportional number represents itself by  $\frac{s}{S}$ , i.e., as quotients of the tension  $s$  of the vapour really present in the air, by the maxi-

mum tension  $S$  corresponding to the saturation of the same quantity of air.\* For the determination of the hygrometric proportional quantity

$\frac{s}{S}$  hygrometers are used, which, as is well known, may be distinguished as chemically acting, absorption, and condensation hygrometers. Here, however, only the condensation hygrometer is to be referred to, which has proved itself in practice the most suitable instrument for these purposes, and more especially that of Regnault, which has been simplified to a very convenient handiness,—which may, in fact, be called a pocket instrument,—and which gives the desired result in a few minutes.

A given constant quantity of vapour which does not saturate a volume of air at a certain temperature would effect saturation only at a lowering of the temperature; and if the temperature were to be lowered still more, water would be precipitated in the form of extremely fine drops (dew). This may be observed, for example, in summer, in cellars, in which warm air entering from without is at once cooled, and gives off its water on the walls. The condensation hygrometer is based on this principle. If we take a vessel of brightly polished silver filled with water, to which small pieces of ice are slowly added, a point will finally be attained at which the outer surface will be covered with a film, a sign that the air surrounding the vessel has been cooled so far as to become saturated with moisture. If we plunge a thermometer into the vessel, and observe the degree at which the moist film begins to form on the surface of the metal, it will be found to be the temperature at which the air of the space in question would be saturated from the amount of vapour contained in it. Regnault's table, in which the tension of vapour at each degree of temperature is given which will saturate the air, enables us also to determine the tension of vapour present in the air to be examined, as that tension appears to be indicated by the temperature  $s'$  which vapour is precipitated, i.e., forms a film on the surface of the metal. If the air at the moment of examination had the temperature  $T$ , determined by means of a thermometer, which corresponds to the tension  $S$ , and if  $s$  is in the tension of the vapour actually present in the air, which is indirectly determined by the formation of dew on the polished surface of the metal vessel mentioned, the hygrometric proportional number  $\frac{s}{S}$  is actually determined.

The simplified hygrometer of Regnault consists of a cylindrical thimble-shaped vessel of very thin silver, the outer surface of which is brightly polished. It measures about 8 centimetres in length, 3 centimetres in diameter, and is closed by a cork provided with three openings. The centre hole serves for the reception of a thermometer, while the two outside openings are provided with right-angled knee-pipes of glass, one of which reaches with its vertical shank just below the cork, and has the horizontal shank open. The other glass pipe reaches with one shank to the bottom of the vessel, the other being provided with a caoutchouc pipe, about a metre long, and ending in a mouthpiece. This simple instrument is mounted on a light stand. If the hygrometric state of a room is to be examined, the instrument is placed in the centre of it, filled two parts with sulphuric ether, and then closed with the cork. Sulphuric ether is used instead of ice in cooling the vessel, slower or quicker volatilisation of the ether being produced by blowing into the caoutchouc pipe, its evaporation being accompanied, as is well known, by a lowering of the temperature, which is continued until dew forms on the outside surface of the vessel. The mouthpiece is kept at some distance from the instrument by the caoutchouc pipe in order to prevent a possible formation of film on the polished surface by the breath of the operator. The vertical glass shank of this pipe reaches to

\* The data which follow are taken from a paper by Marco Cecchi, published in the "Proceedings" of the Association of Engineers and Architects of Rome, June 3, 1880.

† In how many cases such a certificate would have to be withheld in London, if a like examination were made compulsory here, we need not stay to inquire.—Ed.

‡ A cubic metre of atmospheric air contains, in a state of saturation at various temperatures, the following quantities, by weight, of vapour:—

Temperature, Degrees.	Vapour, Grammes.	Temperature, Degrees.	Vapour, Grammes.
0	5.66	16	14.97
1	6.00	17	15.84
2	6.32	18	16.76
3	6.64	19	17.75
4	7.32	20	18.17
5	7.77	21	19.82
6	8.26	22	20.94
7	8.79	23	22.19
8	9.30	24	23.36
9	9.86	25	24.61
10	10.57	26	25.96
11	11.18	27	27.34
12	11.83	28	28.81
13	12.67	29	30.33
14	13.33	30	31.93
15	14.17		

\* According to Regnault, the maximum tensions  $S$  of vapour in mercurial millimetres are at the various temperatures  $T$  (in degrees Centigrade) as follows:—

T	S	T	S	T	S	T	S
0	4.939	9	8.674	18	15.36	27	26.99
1	4.943	10	9.161	19	16.17	28	28.10
2	5.002	11	9.793	20	17.39	29	29.78
3	5.637	12	10.46	21	18.19	30	31.65
4	6.067	13	11.16	22	19.64	31	33.41
5	6.534	14	11.91	23	20.89	32	35.38
6	6.993	15	12.70	24	22.8	33	37.41
7	7.462	16	13.54	25	23.65	34	39.66
8	8.17	17	14.43	26	24.99	35	41.63



the bottom of the vessel, so as to impart a uniform temperature to the liquid by the air blown in all directions. The other knee pipe, open at its upper end, serves for the escape of the ether gas forming.

The temperature at which the formation of dew takes place is a trifle lower than that of saturation. If at the moment of formation of dew the blowing in of air is stopped, the mercury in the thermometer will gradually rise and the dew disappear on a certain degree of temperature being reached, the surface of the vessel assuming its former brightness. The temperature at which the dew disappears is a trifle higher than that of saturation. The exact saturation temperature ( $t$ ) must consequently be sought in the average between the two temperatures at which dew forms and at which it disappears. If we find, for instance, in a room to be examined, and in which the air has been shut off for twenty-four hours, that the saturation temperature is  $22^\circ$ , while on another thermometer we read the temperature of the whole room as  $25^\circ$ , we have, according to Regnault's table, for those temperatures ( $t$  and  $T$ ) the tensions 19.96 and 23.55 respectively, and from them the hygrometric proportional number of  $19.96 : 23.55 = 0.847$ , consequently much higher than the limit ( $0.75$ ) above indicated, and thus in this case the room would have to be declared absolutely uninhabitable.

Signor Ceselli, who took an active part in the many preliminary experiments of Professor Ratti, communicates some remarkable facts respecting the sensitiveness and reliability of this experimental method. In a dwelling the several rooms of which had been found perfectly dry, one room, which, on account of its southern aspect and of being situate in a free corner of the building, ought to have been drier than all the others, showed a relatively greater humidity than the remaining rooms. For some time no explanation could be supplied for this contradiction; but it was at last ascertained that a few days prior to the hygrometric examination a moulding 10 to 15 centimetres wide had been painted in by a decorator. In another similar case the cause of a like contradiction was found to be the painting of a walled-up door-opening which had been done a few days previously. In a third house, not new, but in which alterations had been made, the hygrometric proportional number of a room in which all the parts were old was, on examination, proved to be higher than elsewhere. This greater dampness was caused by the closing up of a window not long before, when a wall a brick thick and 2 metres square had been put in the opening.

Another, more superficial, method of examining a house as to its state of dryness, but which is far more exact than the "practical eye," is recommended by Dr. Paolo Mantegazza, in his hygienic People's Almanac, a procedure which may be well applied where a hygrometer cannot readily be obtained. This method is based on the property of certain bodies of absorbing water contained in the air, and is as follows: Five hundred grammes of freshly-burnt unslaked lime are pulverised, and placed in a plate in the room to be examined for twenty-four hours, doors and windows being closed. After the lapse of that time the lime is weighed again, and if the increase in weight should be less rather than more than a gramme, the room may be pronounced inhabitable. Should, however, the increase of weight amount to five grammes or more, the room cannot be inhabited without danger. The greater or inferior salubrity of the room vacillates between the above limits. Ceselli remarks, very correctly, that mathematical exactness cannot be expected of this method, all the less as the weight ought to vary with the cubic contents of the room; but with rooms of ordinary size it may be very useful in a good many cases.

We are perfectly convinced that to but few there is anything new in what we have stated; those technical and sanitary authorities more especially to whom is confided the examination of the habitableness of new or restored houses may think secretly that, as a matter of fact, nothing that they did not know before has been related above. Why, therefore, so much noise? Now, we thought it advisable to draw attention to the methods pursued elsewhere, because formerly we had to suppose that our sanitary authorities were unaware of the existence of more reliable hygrometric methods than those preferred by them. Or could they with a clear conscience take upon themselves to ignore a

method of examination known to them as better, in favour of a mere inspection and tapping of mite walls?

Considering the haste prevailing in building operations at the present day, and the granting of the certificate for new houses immediately upon their completion,—a certificate, by the bye, rarely refused, and even then in a most ineffectual manner,—we may fearlessly express it as our opinion that, if a proper examination of the degree of dryness of walls, and the rooms which they enclose, were made, nearly every new dwelling, as it is now handed over to the public for habitation, is injurious to health. Why, houses are begun in the spring, and receive their tenants in August! And this is not only the case with private dwellings; even in the case of municipal buildings,—schools, for instance, where the greatest care ought to be exercised,—the same practice very frequently prevails. No one will affirm that such buildings could be sufficiently dry under any circumstances, unless it be his intention to deceive himself.

Signor Ceselli, whom we have already quoted, made the following experiments in 1875. He prepared a cube, 0.5 metre each way, of bricks and sand-mortar, and a second, of the same dimensions, of bricks and Pozzolana cement, and tested both under pretty favourable conditions as to their dryness. The first cube, which weighed 236.20 kilogrammes, and contained 41.25 litres or kilogrammes of water, required for its perfect desiccation 213 days, or seven months. The second cube, for which Pozzolana cement was used, weighed originally 243 kilogrammes, and contained 33.34 litres or kilogrammes of water; its perfect drying took up 438 days, or 14 months. The cubes were placed, isolated, in a basement, and the above figures must, therefore, be considerably enlarged with regard to extensive and complicated walls, which besides, in many places, prevent the direct giving-off of their water into the atmosphere. We do not think that the above particulars require further comment.

Of course, desiccation may be accelerated, artificially, by gas and firing; but in most cases this is continued only as long as wet spots show themselves on the walls, when the "practical eye" permits his dictum of "inhabitable" to be pronounced. Meanwhile, shortly after all the wooden parts of the building begin to swell, and there is not a carpenter or joiner who has not, in new houses, had to use plane and chisel very freely in order to "fit" doors, window-frames, &c., impregnated with water. And this is not done because the rooms have been perfectly dried by means of the much praised practice of "firing." But the artificial drying of new walls is another subject, with which we do not desire to deal.

#### NOTES FROM THE WEST.

The condition of business in the building trade in the West remains about the same. The mild weather greatly facilitates many contracts being pushed forward. Many builders have plenty of work on hand, and the absence of complaints from operatives out of work shows that there is nothing like the amount of stagnation in trade that existed a year or two ago. The agitation amongst colliers of the Bristol coal-field for an increase of wages also tells of an improved condition of things generally.

At the recent meeting of the Gloucester Quarter Sessions, a heavy outlay was resolved on for increased accommodation for the lunatics of the county. The number of patients has, year after year, steadily increased, and great difficulty has been experienced in consequence of want of room. The first portions of the new asylum have been already proceeded with, and are expected to be ready for occupation in September next, but this instalment will not do more than relieve the present severe pressure, and will not make provision for future requirements. A committee of the Justices, who had considered the matter, mentioned in their report that the general increase of lunacy was from 18.67 per 10,000 of the population in 1859 to 28.34 per 10,000 in 1881. They recommended that steps be taken for the erection of the whole of the central block of the new asylum with its dependencies, the two infirmary blocks, and the workshop block. This will provide for 300 more beds. It is estimated the expenditure for this work will be in the next three years 50,000*l.*, and the outlay will in all probability be spread over a number of years.

The Somersetshire Justices have, in Quarter

Session, voted 1,000*l.* for additions and improvements to the laundry of the County Asylum.

The Gloucester Theatre is about to undergo improvement, and amongst other alterations a new entrance is designed.

The old Theatre Royal, Bristol, has been completely transformed under the hands of the new lessee, Mr. Melville. The internal fittings and arrangements have been improved, and the exit doors have been enlarged. The ventilation has also been improved. Mr. H. Foree (Bristol) has carried out the alterations.

Though the effort of some members of the Bristol Town Council to bring about an inquiry as to the possibility of utilising the tidal force in the locality met with little support, the promoters, on again bringing the matter forward, obtained the appointment of a committee, who, after inquiry, reported "it is within the range of practicability to convey to Bristol by means of recent inventions power obtained by the action of the tides." Many members of the Council opposed proceeding further in the matter for the present, believing electrical science still in a very transitory state, but a majority authorised the committee to procure the advice of an eminent mechanical engineer as to how the thing could be practically set about.

The possibilities of electric lighting apparently have not affected public confidence in gas shares of the Cheltenham Company, for the report of a recent sale of ordinary 100*l.* stock gave the prices raised from 200*l.* to 210*l.*

The Swansea Harbour Trustees have resolved to lengthen the Eastern Pier by a further 710 ft. or 720 ft. This extension will protect the entrance to the recently-opened Prince of Wales's Dock from south-west winds. The carrying out of this work will complete Mr. Abernethy's original design. The pier will be of Memel piles and framework, filled in with large blocks of native stone. The scheme is not to be contracted for, but carried out by the trustees' own men. An estimate fixes the cost at about 19,000*l.* The trustees also intend setting about the formation of a harbour of refuge in Swansea Bay, and to deepen the entrance of the channel. They have resolved to purchase at once one of the most powerful dredges procurable, and the cost of this has been put down at about 20,000*l.*

Messrs. Munro & Sons, of Bristol, are engaged in laying out, at a cost of 2,000*l.*, the Walton Park Estate, near Cleveland. The villas erected will be sea-side residences for Bristol merchants.

The tender of Mr. A. J. Beaven, of Bristol, for 745*l.*, has been accepted for excavations, road-making, &c., in connexion with the proposed Weston-super-Mare Summer and Winter Gardens. The fountains, concert-halls, and other buildings will form part of a separate contract.

Tramways are to be introduced to this progressing seaside resort (Weston), and the consent of the Town Commissioners has been given to the provisional order of the Weston-super-Mare Tramways Company (Limited).

#### BUILDING AND DECORATION IN VIENNA.

ALTHOUGH the latest information respecting building and decoration at Vienna bears more the character of local gossip, the data to hand will not be without interest to the readers of the *Builder*, who have followed the progress of building operations in the Austrian capital, as recorded in our pages. The details now furnished, besides referring to the decoration of the Houses of Parliament, Palace of Justice, University,—all subjects well known to our readers,—also throw light upon the ventilation and warming of the new Town-hall, as well as supply particulars respecting the reconstruction of the Vienna Hofburg. *Apropos* of the lighting, heating, and the ventilation of the Town-hall, it appears that, after all the vast sums spent on the exterior of the building, the principle of chaeesparing is to be applied in those important departments. Instead of the original estimate of a million and a half of florins, only a quarter of a million is to be expended for lighting, heating, and ventilating it. Critics at Vienna say that too much light would have shown up the shortcomings of the building; expensive heating apparatus would have made it too hot for the tax-payer; and any amount of ventilation could not have removed the evil odour attaching to the whole business.



But to return to the Hofburg. It is now stated that the Emperor has finally sanctioned the plans for the rebuilding and restoration respectively of the Burg, in so far as they concern the proposals of the Vienna Board of Works (the Staderweiterungs-Commission), the Ministry of the Interior, and the Municipality. We learn from them that a handsome square, the so-called "Heldenplatz" (or Heroes' Square) will be considerably intrenched upon, if it does not entirely disappear. The projecting portion of the Hofburg, the "Nase" (Nose), containing the Knights' Hall, is to be demolished. Its place will be taken by a pavilion-like structure, with high roof. Joining on to this, and constituting the centre portion of the Burg, will be two wings, forming a semicircle, along the Kaisergarten and Volksgarten, with arcades reaching as far as the Ringstrasse. Arcades, with passages for vehicles and foot-passengers, will cross the latter. These arcades will connect the Burg proper with the already existing new Imperial Museums. The portals of the arcades will be surmounted by quadrigas. The so-called "Reichskanzlei" (Imperial Chancellery) is to be built in accordance with the plans of the late Hofbaumeister Fischer von Erlach. When once the old Burg Theatre has been taken down, to be effected shortly, the portal towards the Michaelerplatz, which has at present the appearance of a circular court in ruins, may be completed. The reconstruction of the Hofburg has given rise to various proposals respecting its most immediate surroundings.

It has been stated on a former occasion that the original plans for the reconstruction of the Vienna Hofburg were by Professor Semper. These plans received their present form by the alterations proposed by Baron Hasenauer, the Imperial Architect. These proposals are severely criticised on account of the little provision made for the necessities of the growing street traffic. The accommodation in this respect was had enough with the old Hofburg; but it is represented that it will be much worse now should no alteration be made in the plans for the new one. It was the Swedish statesman, Oxenstierna, we believe, who said that "countries are governed with little understanding." It might be suggested as a parallel that cities are planned and enlarged "with little prevision." There are few exceptions to this rule.

#### ELECTRIC LIGHTING AT THE CRYSTAL PALACE.

THE Electrical Exhibition at the Crystal Palace is slowly, though surely, progressing towards completeness, although no definite date is announced for the formal opening. A large number of the exhibits are already in place and open to the inspection of visitors, while a great deal of work has been done in fixing wires and lamps, steam-engines, and dynamo-electric machines, for the illumination of the extensive building itself. All the chief systems will be practically tried in this way, space having been allotted, for this purpose to, among other firms and companies, Messrs. Siemens Bros. & Co., M. J. G. Lorrain, M. A. Gravier, Messrs. Ströde & Co., Messrs. Rowatt & Fyfe, Messrs. R. E. Crompton & Co., the Compagnie Générale d'Électricité, the British Electric Light Company, the National Electric Light Company, the Electric Light and Power Generator Company, the Anglo-American Brush Electric Light Corporation, Messrs. Hammond & Co., Mr. A. J. Fyfe, M. André, and last, but not least, the renowned T. A. Edison, the results of whose inventive genius, although in the past they were prematurely accepted (if not magnified) by those interested in depreciating the value of gas-stocks, cannot but give visitors to the Crystal Palace the impression that we are now within measurable distance of a very extensive, if not general, adoption of electric lighting. It was to witness the experimental lighting-up of the concert-room by Mr. Edison's incandescent lamps that a number of electricians and other scientific men, together with representatives of the press, were invited by Mr. Edward H. Johnson (Mr. Edison's engineer and manager) to run down to the Crystal Palace on Tuesday evening last. Mr. Johnson, as Mr. Edison's representative in this country, has provided in the basement of the Palace three Robey engines of 25-horse power each, which will drive twelve of Mr. Edison's dynamo-machines. Only one of the engines and a pair of the dynamo-machines were in action

for the purpose of illuminating the concert-room. Whilst some of the visitors who had arrived early were admiring the effects of the illumination, an awkward *contretemps* happened, due, however, in no way to any defect in the electrical apparatus. Suddenly, all the pretty little incandescent lights, enclosed in small glass globes, were extinguished. A visit to the basement showed that, by some neglect or oversight of the man in charge, the water in the boiler of the only engine in use had been allowed to get low, and the fusible safety-plug had blown out, thus preventing a boiler explosion, but, at the same time, bringing the dynamo-machines to a standstill, and thus stopping the generation of the electric current. Pending the getting-up of steam again, the gas in the concert-room was lighted, and the visitors sat down to a substantial collation. By the time justice had been done to this (after the lapse of rather more than an hour), the engine was again got to work, and at a signal from Mr. Johnson, the whole of the lamps, upwards of 200 in number, were brilliant with light. Between the columns of the gallery and across the orchestra the lamps were suspended in continuous strings, festoon fashion, while in the centre of the room was hung a glass chandelier, behind whose drops and spangles were arranged several more of the little globular lamps. The effect of this chandelier was that of a mass of diamonds, and Messrs. Defries, Messrs. Oser, and other makers of crystal chandeliers may be congratulated on the circumstance that one of the most agreeable and popular methods of electric lighting is likely to be that of which we here make mention. The glass presents a beautifully brilliant and sparkling appearance, while in some measure softening the brightness of the light. A good effect was also produced by another and smaller glass chandelier, the bells or globes of which, somewhat resembling lilies in red, blue, and white glass, each enclosed one of the incandescent lamps. Very pleasing also was the result of the disposition of one of the lamps in the midst of an *épergne* of real flowers and ferns. The light was remarkably steady, and, though brilliant, was free from glare. Experiments made on signals given by Mr. Johnson showed that the electric current could be turned off from the lamps in sections or from the chandeliers separately without affecting the remaining sections. Soon after the engine was re-started, the glass globes of some seven or eight of the lamps hung around the galleries burst, owing, it was stated, to the power of the current being rather too high, but the only effect of these breakages was to extinguish the particular lights concerned, without in any way, apparently, affecting the other lamps in the circuit. As an exhibition of electric lighting the experiment was considered a success by all who witnessed it. Sir Charles Bright, Colonel Gouraud, Mr. McGeorge (chairman of the Crystal Palace Company), Admiral Ingfield, and Mr. Johnson were among the speakers, Colonel Gouraud making some remarkable statements illustrative of the spirit of enterprise which animates Mr. Edison and other leading investigators now engaged in seeking to perfect the art of lighting by means of electricity.

#### THE PLEA OF THE CAB-HORSE FOR REST INSTEAD OF FOR CRAWLING.

A PLEA has been raised on behalf of the overcrowded streets of London, the reply to which, if there be one, should be forthcoming. With all due reserve, the *primâ facie* case is a very strong one. The ranks for cabs at the railway stations are occupied by vehicles enjoying a certain privilege. That the managers of the traffic should take this means of ensuring, as far as may be, an adequate supply of decent vehicles, honest and sober drivers, and horses with four legs a-piece, seems, on the first blush of the case, to be a public service. But here lies the hitch. When the station cab has taken its fare to his destination, nine times out of ten it has to return empty; and at the same time, what we will call a wild cab, arriving at the departure side of the station with a fare, is not allowed to take its turn in the file of empties, but is ordered out of the yard to go whithersoever the driver will without either fare or object. Hence a double employment of cabs, involving not only double charges for the station work, and consequent loss, either to the trade or to the public, but also doubly cumbering the streets. A writer, evidently

well at home in the matter, who writes as the advocate of the cab-owners, tells us that a cab covers 90 square feet of roadway. Assuming that there are 2,000 privileged cabs taking fare from stations and returning empty, and an equal number of wild cabs taking fares to stations and returning empty in the opposite direction, 180,000 square feet of the London streets, or one-nineteenth part of the entire carriage-way of the City, are thus unnecessarily occupied; the line of empty cabs being such as would extend from Whitechapel to Shepherd's-bush, for nearly seven miles, the total length of carriage-way in the City being 51 miles.

We can readily conceive that difficulty must arise if there be any attempt made to keep up a privileged body of vehicles. But the question is,—Would it not be more to the public interest to abrogate privileges of this kind, and to make up for the boon thus given to the trade by a more careful inspection of the individual cabs? If each cab that brought a passenger to a railway station were made to take its turn, waiting in the yard until it was required for the arrival, it is clear that, in the first place, the horses would be much benefited by the rest. Secondly, a saving, to the extent indicated, or thereabouts, could be made in the occupation of the streets, and one main source of crawling would be done away with. That the cabs when thus on the rank should be inspected by a proper officer, and not only summarily expelled, but otherwise brought to book, if found in a condition unfit for public use, would be a natural and valuable feature of such a system. By this means, we conceive, all parties would be benefited. Some 200l. a day, at the very least, would be saved by the cab-owners. Regularity would be ensured, the streets would be to some extent freed from a nuisance which it is not easy otherwise to abate; and the hardships of that deserving and over-worked animal, the London cab-horse, would be materially diminished. We trust that either good reason may be shown against the proposal, or that it may receive not only attention but practical support, unless some better mode of meeting the avowed evils of the case be forthcoming.

#### VACANT DISTRICT SURVEYORSHIPS.

##### SUGGESTED PROMOTION OF OLD OFFICERS.

AT the meeting of the Metropolitan Board of Works on the 13th inst., the Building Act Committee brought up a report recommending that the district of Wandsworth and Tooting Graveney, vacant by the decease of the late Mr. A. J. Hiscocks, be divided into two districts, to be designated "West Wandsworth" and "East Wandsworth and Tooting Graveney," respectively; that the former district do consist of that portion of the parish of Wandsworth which lies to the westward of the London and South-Western Railway; that the latter district do consist of the remaining portion of the parish of Wandsworth to the eastward of the said line of railway, together with the parish of Tooting Graveney; and that two district surveyors be appointed for such districts. These recommendations were adopted.

The Committee further recommended that in the above cases, and all other vacancies in the office of district surveyor, the Board do, before issuing advertisements inviting candidates for the appointments, consider a list of the district surveyors who have been for some time in charge of less remunerative districts, and who in the opinion of the Committee are eligible to be transferred, with a view to the Board, should they see fit, appointing some or one of such surveyors to the vacant districts or district.

Mr. J. E. Saunders, chairman of the Committee, said that he and his colleagues were unanimously of opinion that it would be a very desirable thing to give old and worthy district surveyors the chance of being transferred to more remunerative districts than those with which they might happen to be connected. The Board had on its list of district surveyors two old and very able officers, one of whom only derived 62l. per annum from his office, while the other only received about 160l. There were many districts which yielded 800l. or 1,000l. per annum, and some which were worth 1,800l. or 2,000l. Surely it would be only right to promote their officers, for long and faithful service, to more lucrative positions as opportunity offered. Of course it was not proposed to put these old and experienced officers in competition for the same appointments with the younger and untried men who



came forward whenever there was a vacancy created.

Mr. Urynhart, Mr. Richardson, Mr. Fell, Mr. Freeman, and Mr. Fowler, while admitting the desirability of effecting the object aimed at by the committee, thought that the difficulties in the way would be insuperable, and the last-named gentleman moved that the matter be referred back to the Committee for reconsideration, pending which the vacancies mentioned above were not to be filled up. Mr. Richardson, in the course of his observations, asked where the system of transferring officials from one district to another was to stop? Was there to be a general shifting of officials all round whenever a vacancy occurred, with the view of making remuneration accord with ability and length of service? If so, however desirable it might be, such continual changes would be productive of great harm to the public service.

Mr. Selway thought it was unnecessary to refer the matter back to the Committee, but after some further discussion it was agreed to adopt that course.

#### THE AQUARIUM, GREAT YARMOUTH.

In 1875 a comprehensive scheme for an Aquarium, with concert-hall, skating-rink, winter garden, restaurant, &c., was projected, and was partially carried out by a limited company, from the designs of Messrs. Norton & Massey, at a cost of about 35,000*l.* for buildings and fittings only. Last year, in consequence of financial difficulties, the company went into liquidation, and subsequently the whole property was purchased by a few local gentlemen for the sum of 5,000*l.*

Designs for the completion of the buildings on a modified scale have been prepared by Messrs. Bottle & Olley, architects, Great Yarmouth. These have been adopted by the proprietors, have also received the sanction of the Local Corporate Authorities, and will shortly be carried out.

The main feature of the new scheme is the formation of a thoroughly good aquarium hall on the ground-floor. The bulk of the present flat roof, with its columns, girders, &c., will be removed, the main walls will be carried up to about double the present height, and the roof will be supported by carved principals, with boarded and decorated inner ceiling, following a rather flat curve, as the form which gives the best acoustic properties.

The Aquarium tanks will still remain, and form a handsome feature in the hall; there will be promenade galleries all round at the level of the present flat ceiling, and each door will open on to the south balcony and east terrace promenade, and also to a minor hall at the north end, which is included in the scheme.

The elevations will be architecturally treated, though without great elaboration, an ornamental iron verandah and balcony forming a leading feature in the south front.

The outlay on new buildings, &c., will probably approach 10,000*l.*

#### SCHOOLS AT LICKEY END, BROMSGROVE, WORCESTERSHIRE.

THESE schools were completed some time ago for the first School Board elected for Bromsgrove. They accommodate nearly 300 children, and are divided into three departments, for boys, girls, and infants; the boys' and girls' rooms are each about 46 ft. long by 19 ft. wide, with classrooms in addition; infants' room, 34 ft. by 20 ft. Galleries are constructed in the class-rooms, and in the infants' school.

The building is of red brick, with some Box-ground Bath stone dressings; the roofs are covered with purple Staffordshire plain tiles, celled inside at the collars. The interior is coloured a light salmon colour, the lower part of the walls being painted in oil, stone colour. The fireplaces are fitted with bold Leamington-bar grates set in fire-bricks, and with Yorkshire stone chimney-pieces, hearths, and corbels. The internal joinery is of red deal, stained with light walnut stain and copal varnished. The schools are provided with Messrs. Colman & Glendinning's (Norwich) Eastern Counties desks.

The cost of the schools, including fittings, boundary walling, and railing, and draining and gravelling play-grounds, &c., was 2,500*l.* The contractors being Messrs. Brazier & Weaver, of Bromsgrove, and the architect Mr. John Cotton, of Birmingham.

#### THE PULPIT IN CHURCH OF ST. NICHOLAS, GREAT YARMOUTH.

THE pulpit which has been lately erected in this fine old church has taken a peculiar shape. It is constructed of oak and walnut woods, and has been erected under the direction of the Vicar of Great Yarmouth, who first conceived the idea of such a structure, in order that all listeners might from time to time see the preacher.

The work has been designed and executed by Messrs. Buckley & Co., of London (now Messrs. Cox, Buckley, & Co., of Southampton-street).

The total length of the pulpit is 12 ft. 3 in., and its height 7 ft. 10 in. The platform is reached by stairs, of which the sides are formed by boldly-carved branches of vine and fig trees; on the newels of the gate (which is of iron, hammered after an old example) are statues of Moses and David. Standing on the base of the pulpit are figures of several of the Patriarchs and Prophets of the Old Testament; at the corners of the platform are those of the four Evangelists, and in the centre the statues of St. Peter and St. Paul. There are five panels, carved in walnut wood in relief, along the south side, and on the two ends; these panels represent episodes of the New Testament. The details of the carving are rich, and treated with great care.

The total cost of the work was 580*l.*

#### VENTILATING FAN AT ST. HILDA COLLIERY, SOUTH SHIELDS.

AMONG the many improvements in South Shields in recent years none have had a more material or wholesome effect than those carried out by the Harton Coal Company, at their St. Hilda Colliery, which is situated in the centre of the town; the shaft of this acts as the ventilating medium for this and another of the company's mines, distant about three miles, and the workings of which are connected.

The old mode of ventilating the St. Hilda and Harton Collieries was by utilising the shaft of the latter as the down-cast shaft, and that of the former as the up-cast. In order to create a sufficient current to drive the ventilating air through the many and extensive workings of the two collieries, two large furnaces were kept continually burning at the foot of the St. Hilda shaft to cause the necessary draught to force the air from Harton through the ramifications of the two mines. The smoke from these furnaces did not add to the purity of the atmosphere of the town.

The furnace system of ventilation, though simple and efficacious for pits of limited dimensions, has hardly been found equal to the requirements of the extensive system of working now in use,—the outgrowth of modern times.

Of late years several inventions have been devised to provide a refreshing current of air in the gas-loaded coal-mine, and of these one of the most effective is the fan of Mons. Gaibal, of Belgium, adopted by the Harton Coal Company, at their St. Hilda pit. Illustrations of which we give in our present number, together with the buildings for the reception of the fan and the machinery for working the same. This fan is the largest as yet designed in connexion with any colliery in the world, the diameter of the wheel being 50 ft. It is capable of being driven at a speed of 50 revolutions per minute, and at this velocity the outer extremities of the blades travel at the rate of one mile and a half per minute, or ninety miles per hour,—a speed which is estimated to produce a ventilating column of air equal to 200,000 cubic feet per minute, whereas by the furnace system of ventilating, not more than 80,000 cubic feet per minute was obtainable at these collieries.

In order to convey a comprehensive idea of the power of such a fan as we are describing, it may be well to mention that considerable portions of this vast column of air,—between its descent at the Harton shaft and its ascent at the Hilda up-cast,—will have to be drawn through some fourteen or fifteen miles of narrow subterranean passages, in which hundreds of miners are working at the coal.

The fan, manufactured by Messrs. Black & Hawthorn, engineers, Gateshead-on-Tyne, is driven by a pair of high-pressure surface condensing engines, each cylinder of which is 3 ft. 6 in. in diameter, with 3 ft. 6 in. stroke, and fitted with patent expansion piston valves. There are two completely equipped and perfectly

distinct engines provided for the working of the fan, so that, in case of a breakdown on the part of one of the engines, the other can at once be brought into action to keep up the ventilation of the mine. Over the engine-bed is a travelling crane for the purpose of lifting and dealing with the ponderous pieces of machinery when alterations or repairs may be needed. The boilers, which are double-flued and very powerful, are capable of bearing a working pressure equal to 75 lb. on the square inch.

The buildings for the reception of the fan and its accessories are built of brick, relieved with buff brick bands and stone dressings. The buildings, like the machinery, are of the most substantial character, the walls up to the line of centre of fan-chamber being constructed of brick in cement, resting on a thick slab of concrete, every provision being made for minimising the vibration, and the architect has shown what may be done in the treatment of such unpoetical structures.

Mr. George E. Forster, of Washington, was the contractor for the building department.

In planning these improvements, the company had in contemplation a large increase of the output at their Hilda Colliery, and when the colliery workings are extended, the hauling machinery, hauling engine-house, and working gear at the pit-mouth, will be remodelled and modernised to harmonise with the new works.

Mr. J. J. Lish, architect, Newcastle-on-Tyne, has designed and superintended the carrying out of the work, and he has executed a commission of a similar character for the Bedlington Coal Company.

#### PARSONAGE AT LITTLE HEREFORD, NEAR TENBURY, HEREFORDSHIRE.

THIS house was built for the Rev. Llewellyn Jones (now Bishop of Newfoundland), the old dilapidated parsonage being pulled down to make way for it. It is built of red bricks, made from clay on the site, and has dressings of Bath stone. The original design included bay windows, which were dispensed with to reduce the cost. The roof is covered with Staffordshire tiles, and the internal joinery is of red deal and pitch pine, stained and varnished. The hall is laid with encaustic tiles. The lower sashes are glazed with plate glass; the tracied staircase window with cathedral tinted glass, in pattern work and lead lights. A small plan appears with the view. The contractor was Mr. Smith, of Tenbury; and the cost of the house was about 1,900*l.*; the architect being Mr. John Cotton, of Temple-row, Birmingham.

#### A STATUE OF EVE.

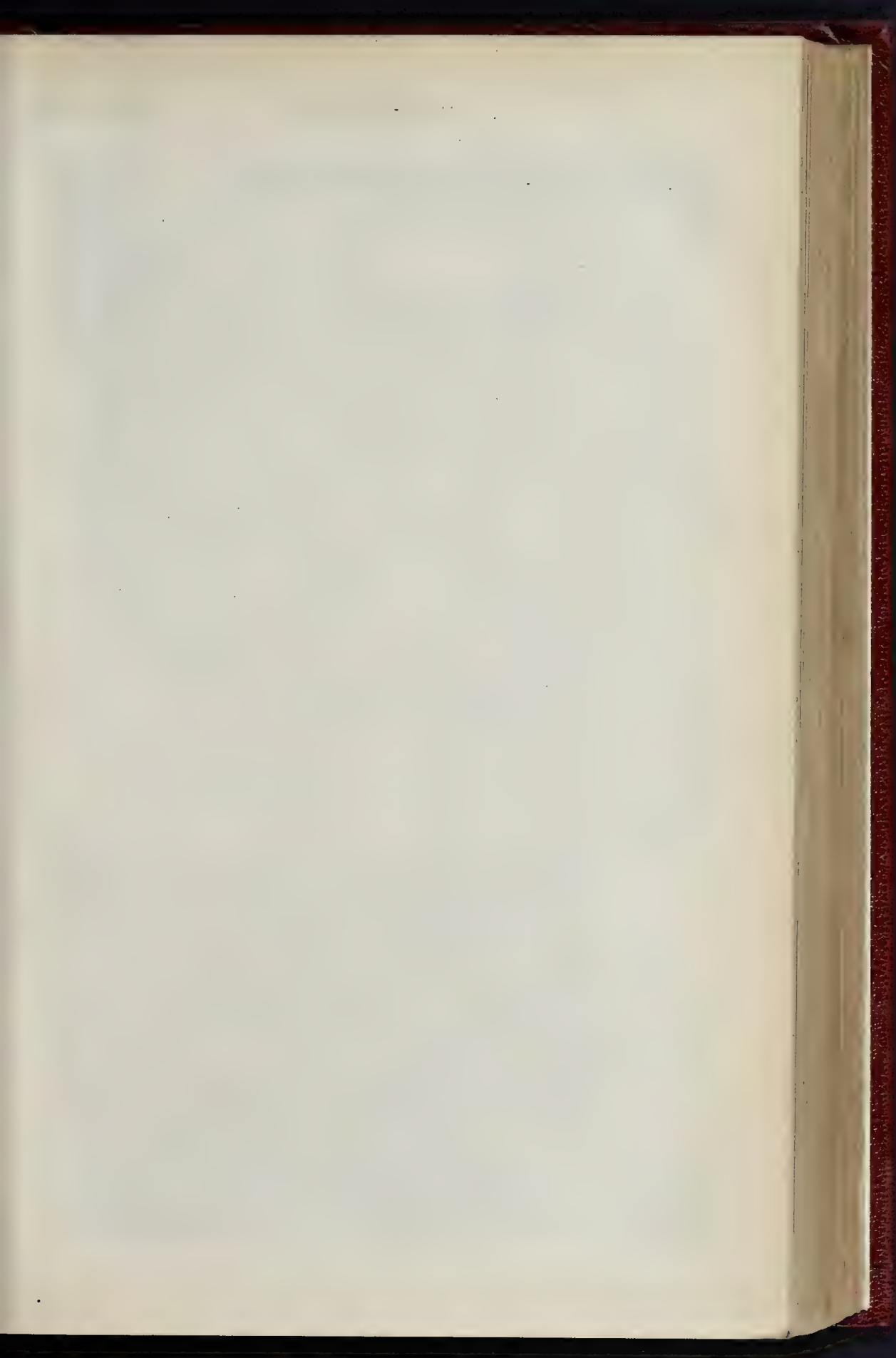
THIS figure (illustrated by us) represents Eve after the fall (at the first instant of regret, while she does not yet fully realise the extent of her sin, and while her graceful face still preserves its gentle features, not yet changed by remorse. It is at the moment when God, chiding her, asks, "What is this that thou hast done?" and she answers, like a child at fault, "The serpent beguiled me, and I did eat." She also, like Adam, awakens at that instant to a sense of her nudity. Signor Villa has seized it, and shows Eve, with a gesture full of grace, grasping one of the large leaves of a *Musa Paradisiaca*, and drawing it towards her. The technical execution of the statue is admirable.

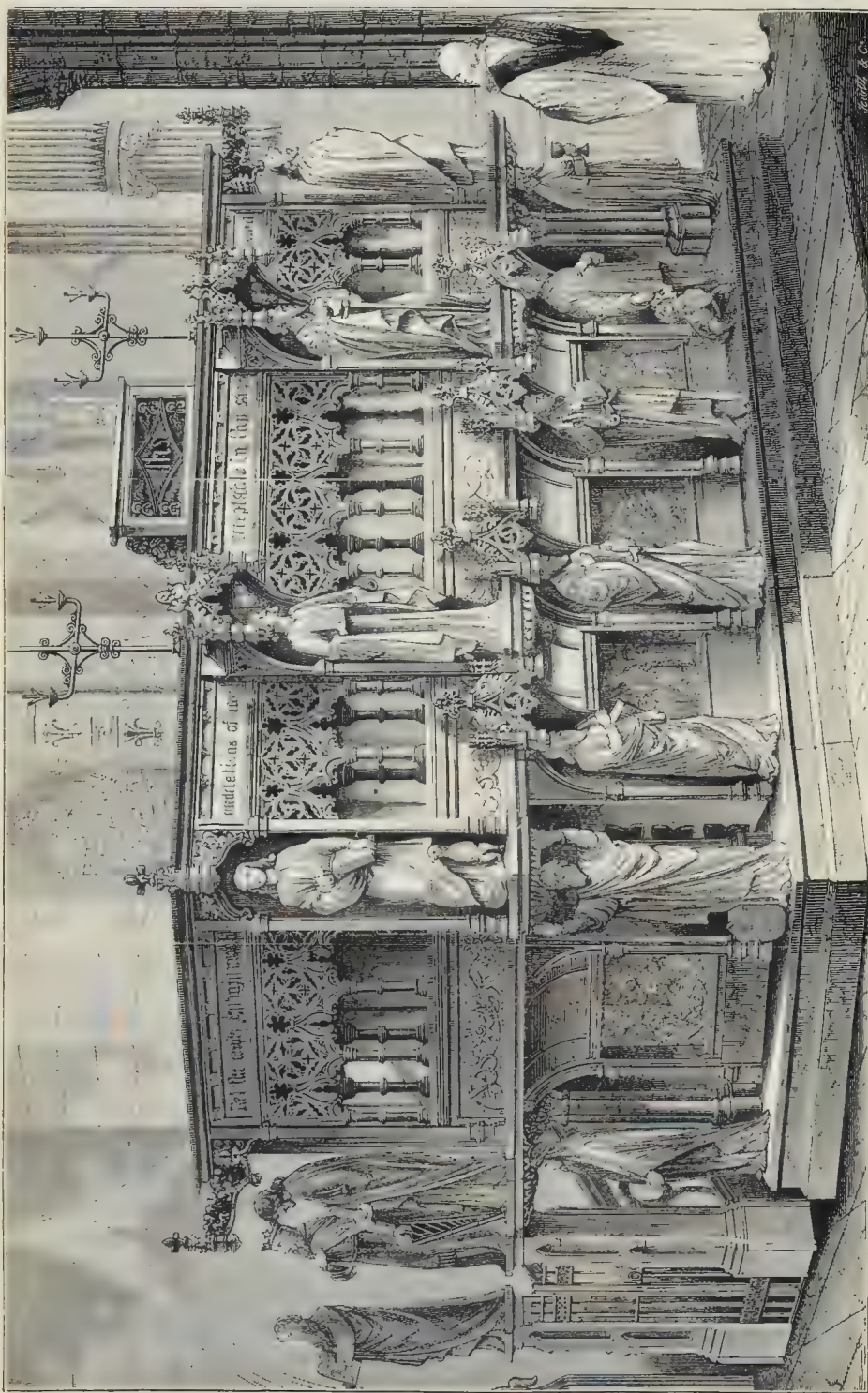
#### REMOVAL OF MATERIALS FROM BUILDINGS ON WHICH MONEY HAS BEEN LENT.

IN reply to a letter on this subject (vol. xli, p. 530), signed "W. G.," we have received a letter, signed "John R. Rowland," applying the statements to a particular case, which may or may not be the fact, so far as we know, and denying the correctness of "W. G.'s" statements. Into a personal dispute of this kind we cannot enter. We printed "W. G.'s" communication solely with a view to the discussion of the broad question involved.

A Meeting of the Civil and Mechanical Engineers' Society will be held at seven o'clock p.m. on Thursday next, the 28th inst., when a paper "On certain proposals for the Amendment of the Patent Laws," by Mr. W. Lloyd Wise, will be read.

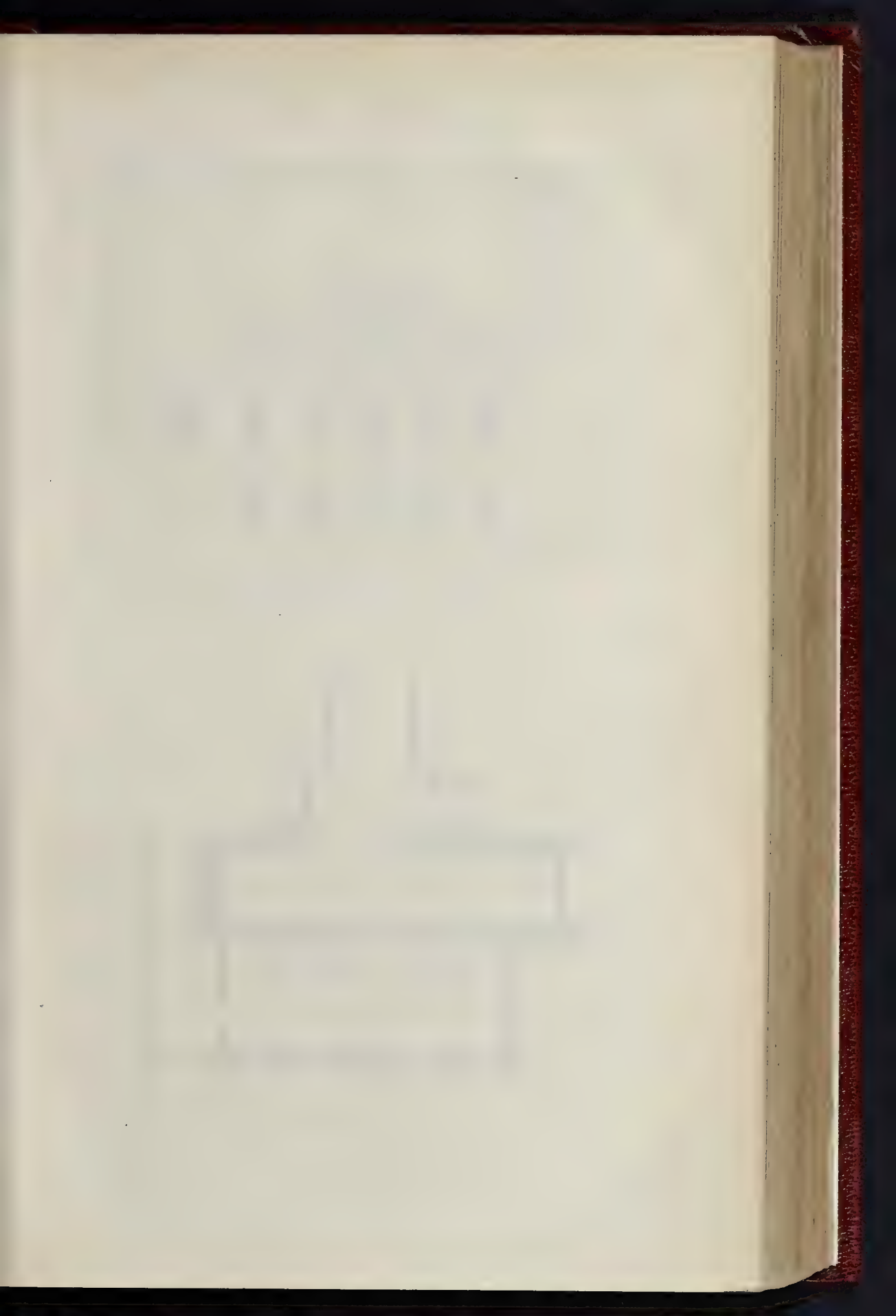




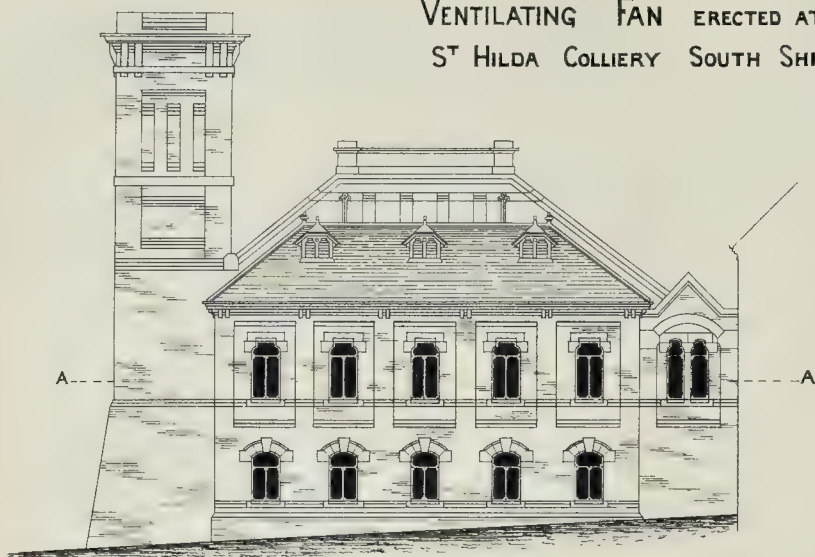


THE PULPIT, CHURCH OF ST. NICHOLAS, GREAT YARMOUTH.—DESIGNED AND EXECUTED BY MESSRS. BUCKLEY & CO.

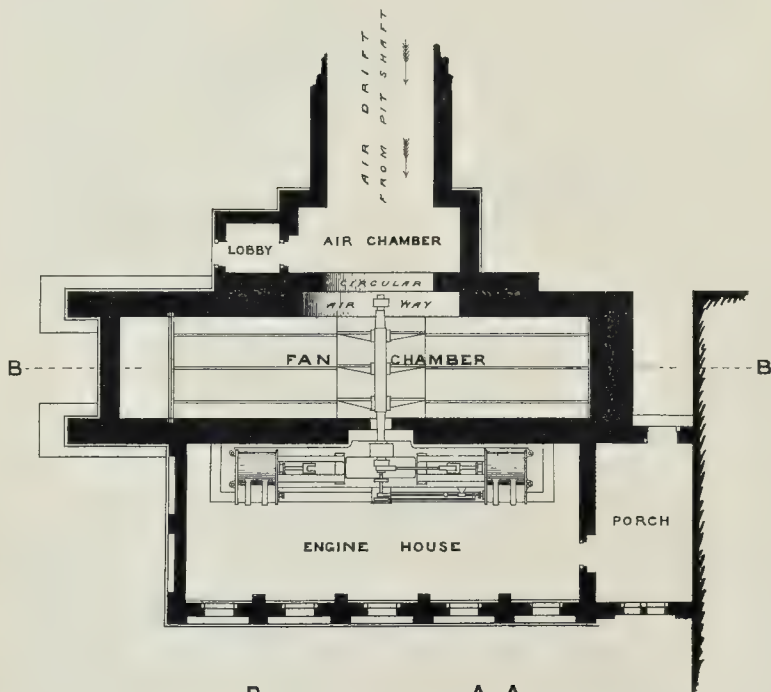




# VENTILATING FAN ERECTED AT ST HILDA COLLIERY SOUTH SHIELDS



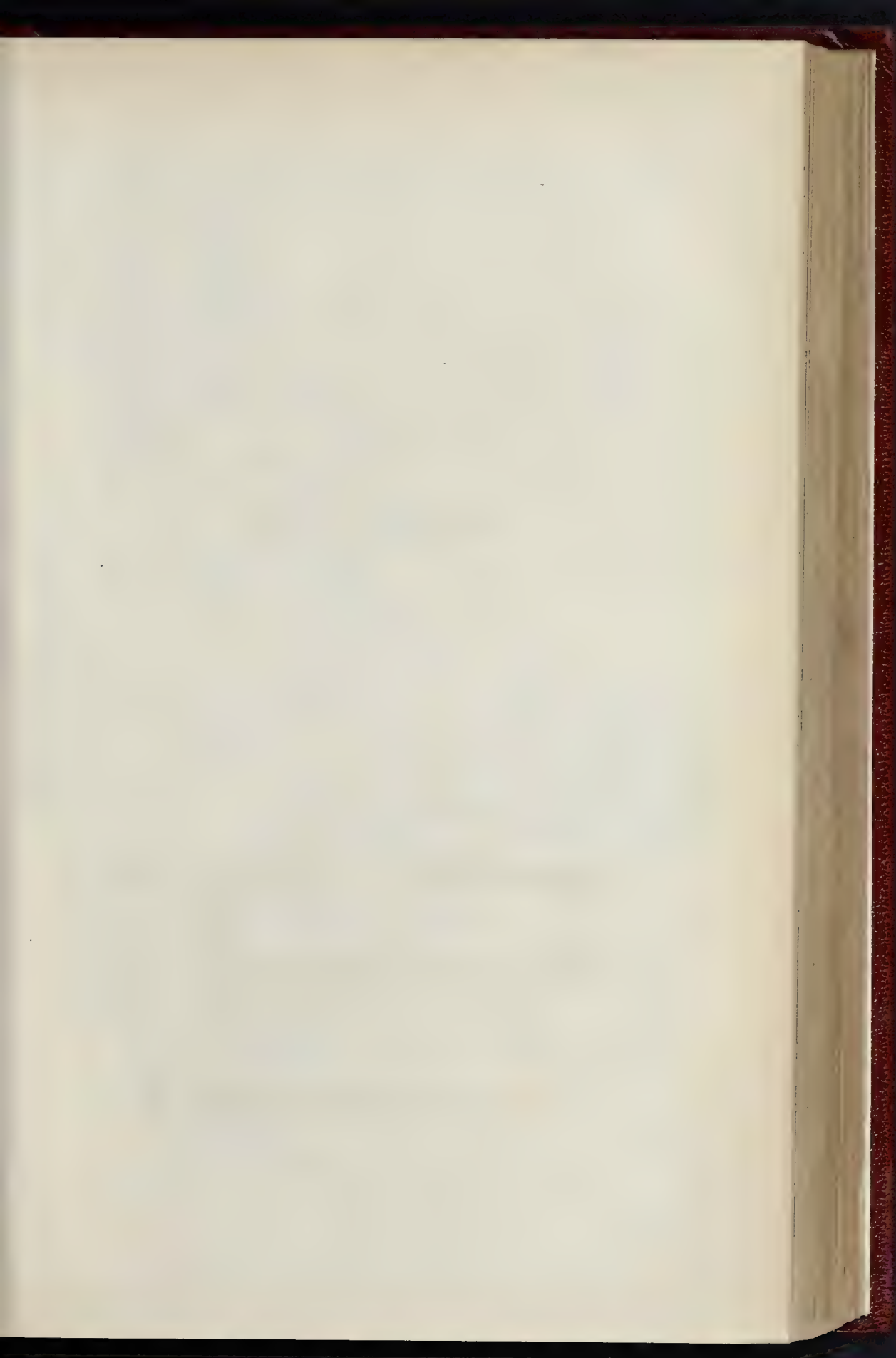
SIDE ELEVATION SHEWING ENGINE HOUSE  
TOWER AND FAN CHAMBER



PLAN AT LINE A,A

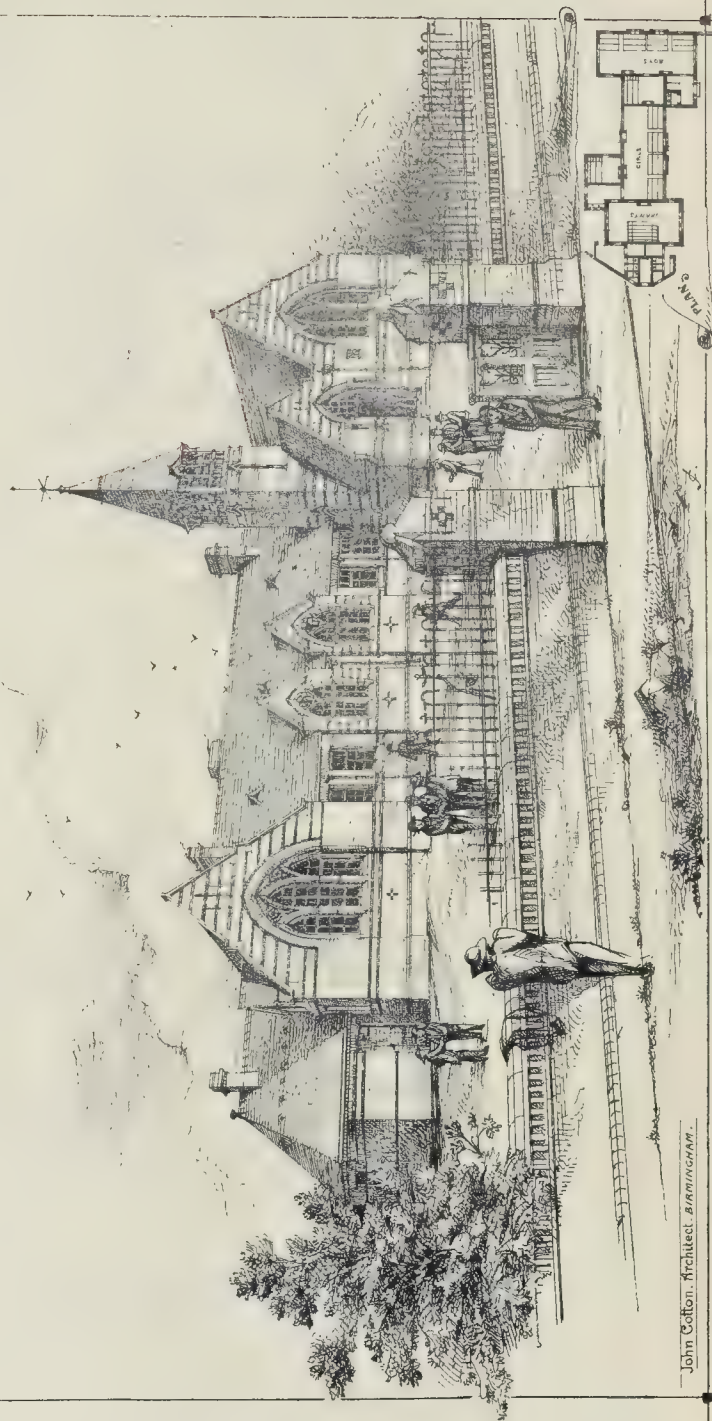
J. J. LISH ARCHITECT  
NEWCASTLE ON TYNE





THE BUILDER, JAN. 21, 1882.

THE LICKY-END BOARD SCHOOLS, BRIMS GROVE.



John Cotton, Architect, BIRMINGHAM.

C. F. Fish, Photo-grapher, London, W.

Wynne & Sons, Printers, Glasgow.



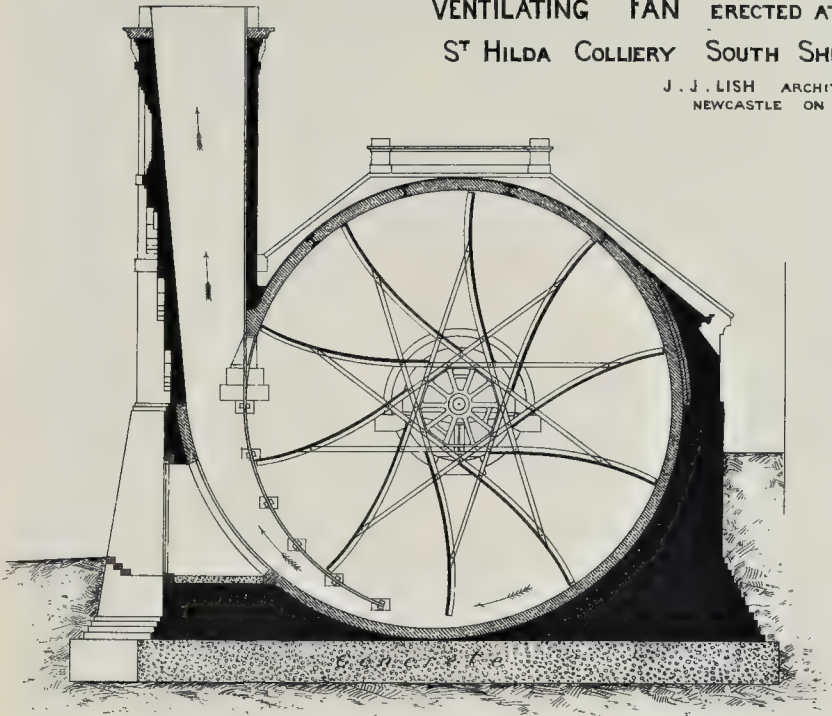






# VENTILATING FAN ERECTED AT ST HILDA COLLIERY SOUTH SHIELDS

J. J. LISH ARCHITECT  
NEWCASTLE ON TYNE



SECTION THRO FAN CHAMBER ON LINE. B.B



TRANSVERSE SECTION THRO CENTRE OF ENGINE  
HOUSE FAN CHAMBER AND AIR-DRIFT







EVE: STATUE IN MARBLE, BY SIGNOR G. B. VILLA, GENOA.





# DO THE RAYS OF HEAT CARRY WITH THEM ANY OF THE IMPURITIES OF THE SOURCE FROM WHICH THEY EMANATE?

From frequent remarks we hear, and from the observations of various writers even in scientific journals, upon the unwholesome effect of the heat radiated from certain substances, we must infer that it is generally supposed that the quality of radiant heat is effected by the radiating material. I speak with some hesitation, as we know so little about this beautiful principle of warming as yet, but I believe this theory is entirely incorrect, and that all the rays of heat are absolutely pure, no matter what their source may be; that the rays of heat from a manure heap are just as pure as those from the pure white-hot platinum coil.

Some odours are rapidly diffused through a room in some mysterious manner, but I think we cannot justly charge this distribution to the rays of heat. We must look to some other medium to find the true carrier of these smells. The rays of heat from the sun certainly bring no odours with them through the vast space of intense cold through which they pass. And what would become of our ardent love of the direct radiation from the open fire if we were to find that it carried with it the deadly gases that are so freely formed during the combustion of all kinds of fuel? To be sure, there is very frequently some perceptible odour from the ordinary open fireplace, which varies with the different kinds of fuel burned, but their distribution is through some other source than by the radiant heat. It is a very common thing to see little puffs of smoke escaping from the best-regulated fireplaces on the sudden closing of a door or in certain blasts of wind.

If, therefore, all radiant heat is absolutely pure, it makes no difference whether we use the intensely-smoking bituminous coal or the gassy anthracite, or coke or gas, or any combination of these, in our fireplaces, or whether we use cast iron or wrought iron, or freclay, or the finest glazed tiles for our stoves, or hot water or steam for our heating pipes, so long as we use only the pure radiant heat from these warmed surfaces. But it is a very different thing the moment we allow the air warmed by these substances to remain in the room to be breathed. One of the great charms of the open fire is that nearly all the air that is warmed by coming in immediate contact with the burning fuel is carried directly up the chimney. It is by no means necessary, however, that this valuable principle should be confined exclusively to the open fire.

Any radiating surface placed in an open fireplace, where all the air warmed by coming in immediate contact with the hot surface was carried up the chimney, would have the same wholesome effect as the open fire, barring always the luxury of poking it.

It is quite possible in this way to secure all the valuable effect of the open fire in a more complete and perfect form. Even that dreadful demon of a bright red-hot stove is rendered as harmless as a rattlesnake with its fangs removed. I remember to have fallen quite in love with, not a little demon, but a big one, of this sort, in a general waiting-room at a ferry and railway-station, through which I had to pass frequently.

At first, I was greatly prejudiced against it. I thought it was a perfect disgrace for a respectable railway company to treat their customers so shamefully; but familiarity did not breed contempt in this particular case—it happened to be an exception to the general rule.

The radiation from the bright red-hot surface of the cast iron was almost as congenial on a cold, damp day as the radiation from a mass of burning coal in a fireplace. The fuel being burned in a close stove, the combustion was much more perfect, and there was no danger from the escape of gas or smoke. One great advantage was that, as it stood in the centre of a large space, the passengers could get all round it, and a dozen or so could get warmed at the same time. Of course, the great charm in this particular case was that there was a good ventilator immediately above it, which permitted the rapid escape of, not only all the warmed air that came in immediate contact with the stove, but the heated air escaping, drew with it much of the foul air of the room. I even found that the disgusting odours of a tobacco-pipe were scarcely perceptible there. Finally, I had to change my mind very decidedly, and give the

railway company credit for a great amount of good common sense in providing their customers such an excellent and thoroughly simple arrangement.

Notwithstanding, radiant heat is always pure, no matter from what source, yet all heating surfaces in a room should be kept scrupulously clean, because, like the puffs of smoke from the fireplace, it is almost certain that some of the air from the heating surface will linger in the room even with the best of ventilation. This want of cleanliness is very disgusting in many of the heating arrangements in large buildings.

I was watching a man the other day eating his lunch in the British Museum. He deliberately poked the bones and scraps of meat, &c., through the gratings on to the heating-pipes. This fashionable way of placing the heating-pipes under the floor, with an open grating over them, is a very unfortunate one,—all the sweepings and dust of the floor are likely to get on to the heating surface. On removing recently some pipes thus placed, we found them covered with a felt-like matting, about  $\frac{1}{2}$  in. thick. The warming-up of this mass of dirt and street manure, &c., every morning, when the air from it is allowed to circulate in the room, is sufficient to disgrace any heating arrangement, whether the pipes are filled with water or steam, or any other material.

We have no very accurate data as to the physiological effect of radiant heat from surfaces of different temperatures. Our physicians have not favoured us with many trustworthy experiments on this point.

There is a general impression that the radiating heat from a bright fire has some valuable stimulating effect. I enjoy my Turkish bath in the morning by sponging with cold water in front of a roaring hot fire, and turning round like a goose on a roasting-jack. This is not a good all-day arrangement, however.

The sunny side of a board fence on a clear cold day in winter is the favourite resort of cats, dogs, and lazy men. I enjoy it very much. The non-conducting boards absorb the heat of the sun and soon become warm. One side of the body is, therefore, warmed by the fence, and the other by the direct rays of the sun, which gives a very genial and uniform distribution of the warmth, with a free circulation of the cold air. Nothing could be better for a consumptive patient.

For general practical purposes, I think, surfaces of mild temperatures uniformly distributed over the room with a slight concentration of heat under the windows, give the most general satisfaction.

Some day we may consider the warmth, dryness, and comfort of our dwellings, of sufficient importance to go to the trouble and expense of warming the construction as well as ornamenting it.

LEWIS W. LEEDS.

## COLOURED PLASTER DECORATION FOR CHURCHES AND PUBLIC BUILDINGS.

HAVING just carried out some rather elaborate decorative work in a provincial church on a system which, so far as I know, has not been adopted elsewhere, I venture to give my experience in connexion therewith, in the hope of getting the opinions of some of your numerous readers on the subject.

I think it is admitted by all who have studied the matter, that there is room for improvement in this direction, with a view to making colour decoration more effectively withstand the effects of time and dampness, as well as the effect of condensed vapour, which this work is invariably subjected to in buildings of this kind.

The process generally adopted in carrying out this kind of work,—where real fresco work is not introduced,—is in preparing the walls with four or five coats of paint (white-lead mixed with oil) for the groundwork, thereby stopping the porosity of the plaster by a substance that would be altogether about the thickness of a wafer, and on this superficial layer, or skin-like substance, decorative work of considerable cost is often painted.

Now, sir, if it were possible for the temperature inside of buildings to be always lower than that of the outside, this work would probably last a considerable number of years; but, of course, that cannot be. Immediately the temperature inside is raised, either by artificial heat or otherwise, the evaporation of the dampness in the walls has a tendency to go inwards, but is kept back for a time by the thin layer of paint

before alluded to. Considering that the evaporation of water occasionally bursts steam-boilers, I do not think we ought to be surprised if it forces itself through a few coats of paint, either by forming blisters in that substance, or otherwise speedily perishing it, in order that it may make its legitimate escape.

Another drawback to this process is the effect which the condensed vapour has upon it. The vapour, coming, as it does, in contact with the cold surface of the painted wall, is at once condensed, and its particles, obeying the law of molecular attraction, form themselves into streams of water, which run down the walls, carrying particles of colour with them; in fact, I have frequently seen little streaks of red and blue deface the whites, or other colours, as the case might be, solely through this cause, notwithstanding the fact that the colours were mixed with the best varnish, with only just sufficient turpentine to take off the gloss, and this occurred when the work was comparatively new.

The process which I have very great confidence in is executed in the following manner, and, in order that I may better explain it, I must ask you to kindly imagine an end wall of a Gothic church to be decorated: this wall containing a window, leaving a space of 4 ft. or 5 ft. each side, each of these sides to have an angel painted on a lozenge-shaped ground of a deep red colour, the latter on a background of rich "vellum" colour, with conventional foliage painted thereon. At the springing of the window-head, a string-course; above that, on each side of the heading of the window, figure subjects, two on each side, painted in circles, with another circle at the top of the window, under the apex of the roof, containing the emblem of John the Baptist. The vellum coloured background above the string-course to have a powdering of gold stars, and the dado to be of a reddish tint, say, red Mansfield stone colour.

The whole of the surface, with the exception of the dado, should be laid in with a coating of Parian cement, mixed with sienna and ochre, to give it the proper vellum tint, and ganged with just sufficient silver sand to give the surface a granulated effect. I will here mention that this sand gives just enough porosity to the plaster for it to absorb the colours used for the ornament or detail work, which I shall presently refer to.

The circles for figures and shapes for ground of angels should then be struck out, and the outline of figures traced on, leaving the flesh, draperies, and nimbi the colour of back ground, viz., vellum colour.

The grounds of these subjects within the circles should then be carefully out out before the surface gets too hard, and filled in with coloured plaster of suitable tint. The string-course should also be out out and filled in likewise, and the whole surface of the dado laid in with the colour above indicated.

After this it is best to let the work stand for a fortnight, as there may be a slight alkaline efflorescence come to the surface, which, however, can be easily washed off with a little water and a stiff brush, and which, according to my experience, does not appear the second time.

The detail of the figures may then be traced on, and outlined with dry umber (or other colour), mixed with three parts of varnish and one of turpentine. I find that colours mixed in this way penetrate the plaster to such an extent, that there is no getting it off except by hard scraping.

I prefer to paint the draperies and flesh in glazes or half-tints; the lighter parts can be effectively and quickly obtained by scraping out, allowing the light ground to show through.

The result is that the greater part of the surface of the wall is left "open," as it were, and gives free vent to any evaporation that may take place, so that it has ample opportunity to make its escape round about the ornament instead of going through it.

By making experiments with a variety of cements, I found that McLean's non-efflorescent cement answered admirably, and it seems in every way to be well adapted for this work. I am aware that a combination of plaster, colour, and alum, is used in scagliola work, and am also acquainted with the process of "buon fresco," "secco fresco," and the lime painting of the ancients, which leads me to think that the process above referred to, taking it altogether, is new.

E. L. VOICE.



### THE TIMBER TRADE OF LONDON AND THE PROPOSED AMENDMENT OF THE BUILDING ACT.

At the meeting of the Metropolitan Board of Works on the 13th inst., the Works and General Purposes Committee reported that they had had before them the memorial received by the Board, on the 23rd ult., of representatives of the timber trade in London, on the subject of clause 18 of the Metropolitan Management Building and Floods Prevention Acts Amendment Bill. The clause in question provides that no stack of timber or wood, nor any timber stage, shall be set up or erected within 30 ft. of a highway without the consent, in writing, of the Board, or except under such conditions as the Board may think proper to attach to their consent, and penalties are provided for any breach of the proposed enactment. The memorialists urged that they had hitherto enjoyed the free use of the premises they occupied, and that they were unaware of any ground for interference which was of a nature materially to lessen the value of their property, and for these and other reasons they asked the Board to withdraw the clause. The committee, having given very careful consideration to this matter, and to the representations placed before them by the memorialists, had come to the conclusion that, under all the circumstances, the Board might be advised to withdraw the clause, and they recommended in accordance with that view.

Mr. Dalton, in moving in accordance with the recommendation of the committee, observed that this matter had very recently been before the Board. On the 9th of December the Parliamentary Committee presented a report, admitting, for the approval of the Board, a draft of this Bill. There was then considerable opposition to the 18th clause, and a long discussion took place in regard to it, the result being that the Board was about equally divided *pro* and *con*. Since then a very important deputation from the timber trade had waited upon the Board and explained the grounds of their objection to this clause. The memorial of the deputation was referred to the Works Committee, and the committee now advised the Board to withdraw the clause in question altogether.

Mr. Richardson moved an amendment, the effect of which, as he explained, would have been to limit the operation of this clause to stacks of firewood.

Mr. Dresser-Rogers seconded the amendment, which, however, was opposed by Mr. Fowler on the ground that any such legislation was unnecessary. Complications would, he urged, arise by placing restrictions on stacks of firewood, which was cut up in lengths in the same way as lath-wood. Who was to decide what was "firewood" and what was not? The magistrates would give conflicting decisions, and cases would be remitted to the higher courts for consideration, at great trouble and expense, without conferring a corresponding amount of benefit on the public.

Mr. G. Hill said the only accident that had occurred in connexion with these timber stacks happened under conditions which would be quite allowable, even if the Board obtained the power it sought. He hoped the Board would not impose on a large and important trade restrictions which were quite unnecessary.

After some further discussion, the amendment was put and negatived by 24 to 8. The report of the committee was then approved.

### CALCAREOUS STONE.

SIR,—Mr. Abbey refers to my letter advocating the use of the volcanic rocks for the construction of city buildings for the purpose of asserting that if limestones were oiled when in a dry state it would be rendered durable. If he means to imply that the process would give durability to the freestones used in London and other towns, I am afraid his thirty-five years' experience has been of little use to him. Much better applications than oil,—which would require at least annual renewal,—have been tried and found wanting. What is necessary is rather to treat the stone while it is in a moist state with some substance which will so far mix with the water as to be absorbed readily and deeply, but when once there will no longer be soluble in water, and no longer affected by it.

M. Kuhlman, of Lille, nearly succeeded some ears ago in depositing a solution of flint in the

pores of stone. The flint, however, that was formed, though extremely hard and apparently like flint, remained, in fact, to a certain extent soluble. In a laboratory the experiment, like many others, seemed successful; but in the open air, on a large scale, it failed. Tried in Paris, it answered well for a time; but tested in the rude blasts, damp air, and sulphurous vapours of our metropolis, a single winter was sufficient to show its weakness.

For twenty years afterwards there were many inventors patenting processes in England to preserve stone for ever without defacing it. All these were failures except one, and that has more nearly attained success than any other. This is Mr. Ransome's, by which the exposed parts of soft stones, whether limestones or sandstones, are turned into a kind of concrete, exceedingly hard and well adapted to resist damp and acid vapours. The solution is tetrasilicate of soda, followed by a wash of solution of muriate of lime. Decomposition of the two salts immediately takes place, the silicic acid parting with the soda to take up the lime, and becoming silicate of lime, while the muriatic acid, set free, combines with the soda, also set free and forms muriate of soda. The silicate of lime is precipitated in a finely crystallised state in the pores of the stone.

But although no serious decay of the stones of the bay at the Houses of Parliament treated by Mr. Ransome had occurred at the last examination some years ago, I fear, as we have heard nothing of late of its success, we must conclude that it has failed, and that no building in London will be imperishable that is not constructed of material obtained from the metamorphic or igneous rocks,—English granite, porphyry, basalt, and serpentine; and the porphyritic breccias,—verde-antico and rosso-antico from Greece and Italy.

These materials require special architectural treatment to exhibit their great natural beauty to perfection. This at present is limited to a repetition, *ad nauseam*, of a few columns and architraves in buildings otherwise constructed of free stone. A different method was adopted in Europe and the East, and to this day commands universal admiration. Of S. Maria del Fiore at Florence, Mr. Quilter says,—“On a grey April afternoon one building alone refuses to succumb to the influences of cloud and rain,—refuses to lose its beauty or be deprived of its colours,—its shades of red, yellow, black, white, and green marble still standing out clearly perceptible through the heavy atmosphere.” “That campanile of Jasper and porphyry.” Mr. Street said,—“Giotto's Tower is the most perfect example of colour in construction.” Mr. Edward Barry,—“The technical skill of the architect and the painter's love of colour are combined. The coloured marbles heighten the effect of the architectural details.” “At Genoa Cathedral the door-jambs have plain marble splays, with an infinity of elaborate patterns in coloured marbles, all with flat smooth surfaces, and exhibiting the beautiful materials to the best advantage.”

In some such way as this we may obtain durability for London buildings, but certainly not by the application of oil to limestone. And in the country if freestone be well selected, it will stand perfectly well in its natural condition.

H. TRAVIS.

### ASHBURNHAM HOUSE.

SIR,—With the exception of the last paragraph, your notice about Ashburnham House and its staircase, being founded on facts, does no harm to any one; but the last paragraph, being almost wholly founded on the hypothesis of what the Chapter choose to say the School are going to do, is not so truthful or innocuous.

It is a fact that the Chapter and their friends themselves took into serious consideration, about ten months ago, two plans, one of which was to turn the site of the house into a “campo santo”; this was a favorite hobby of a no mean personage, but was not a good ground on which to fight the School, as intramural sepulchres is not growing in favour nowadays. Therefore the present plan of an architectural and archaeological bowl was substituted. It ought to be perfectly well known that close to Ashburnham House there is another ceiling, also attributed to Inigo Jones, the vaulted part of which remains as it was when

first designed, and the tracery of which is not choked up with lime-wash and filth. This ceiling has all along been in the custody of the School.

The ceiling at Ashburnham House has been practically destroyed by the chapter occupants in past times, and I am glad to see that you have judiciously omitted from your drawing of the staircase a brass handrail disfigurement, which has been recently placed there.

Perhaps you could oblige me with the names of a score, or even say five, people who have seen this house in times past as part of the general public; in fact, no one ever had an opportunity of getting in unless he was a personal friend of the occupant. Now all this will be changed. Or perhaps some one will explain why it is, if Westminster Abbey is a “vast charnel-house,” that the canons are so anxious to obtain residences in its immediate vicinity for themselves and their families; or why should the most eminent London physicians remove their sons from country schools to send them to Westminster School as boarders or day-boys. Westminster is well known by all, except its defamers, to be as healthy as any school in the country. No case can be cited of epidemic zymotic diseases, as with some large country schools. And, finally, the Legislature deliberately decided in 1868 that Westminster School should remain in Westminster, and that if it were removed, it should lose all its property, whether land or money. Large and constantly increasing numbers of country parents send their sons as boarders to the school, and it may, therefore, be assumed that they do not find the evil results you suppose to exist.

I trust you will insert this, as the supposed facts on which the arguments at the end of your article are based have been widely disseminated with the intent to mislead. O. W.

SIR,—The opinion expressed by the writer of the article in your last number that there was formerly a dome to the ceiling of the drawing-room of Ashburnham House, confirms statements made by Cunningham in his “Handbook of London,” and by others. Having by the kindness of Mr. Wild, the orator of the Soane Museum, been allowed to examine again the drawings made about the year 1812 for Sir John Soane, I find that these statements are well founded. The drawing of the ceiling shows a small dome or lantern rising from the large central panel.

The little book of Ware's “Designs by Inigo Jones and Others,” to which I referred in my former letter, may be commended to the attention of students of the works of the great architect. In addition to many plates of details, as chimney-pieces, ceilings, &c., it contains representations of two of Jones's most important works,—the Chapel of Somerset House and the Theatre of Barber Surgeons' Hall. The latter, as your readers will remember, was accounted by Walpole to be one of Jones's best designs. If, as I am inclined to think is the case, these are the only representations of the two works, Ware's book should interest the antiquary no less than the architect. ALFRED MARKS.

### LEAD POISONING: POINTING MORTAR AND SILICATE OF SODA.

SIR,—Maybe the following chemical hints will, in some degree, help your correspondents, W. Eastwood, and “L.”

Pure water has no action on lead, but pure water and air jointly act very powerfully on lead. Water containing carbonic acid (or lime carbonate in solution of such water) is feeble in its action; but, on the other hand, an excess of carbonic acid materially aids the solvent power of the water, because the lead carbonate formed is soluble in the carbonic acid excess. Some salts, such as the carbonates, sulphates, and phosphates, lessen the action, but the chlorides and nitrates assist it in a marked degree. The conditions are not such as will warrant one in pronouncing off-hand what water will or will not take up lead if in contact with it. The safest view to dogmatise upon is that it is exceedingly rare to find a water free from lead after storing in receptacles made of that metal.

If slaked lime be wetted up with a solution of sodio silicate, the mass quickly sets and dries to a durable silicate of calcium and sodium. The addition of the sand to the lime will produce exactly the compound sometimes employed

\* Our correspondent has apparently misread the paragraph.



in fresco-colour work. If "L" should have made no experiments in these matters he may find a little difficulty at first in the management of the actions which are set up under these conditions. The hardening or setting is at times very rapid, and at others imperfect. Sodio silicate intensely and uniformly hardens some of the carbonates like chalk, and magnesic carbonate to an extraordinary degree, but in the case of lime there is at times the modifying effect due to its own activity, when it is slaked or hydrated. There is frequently a very unsightly efflorescence produced from application of sodio silicate, due no doubt to the formation of sodio carbonate by atmospheric carbonic acid breaking up the silicate. I do not know if there be any objection with "L" to use potassic silicate, and so to a very great degree avoid this. The most perfect results, as "L" probably is aware, are derived from treating the silicated body with calcic chloride, whereby a double decomposition gives sodio chloride (common salt) and calcic silicate.

JNO. BOWING, Chemist.

SIR,—Reading your valued paper this week, my attention (as an analytical chemist, and as one who has had no little experience in matters relating to water), was directed to the letter on lead poisoning. If Mr. Eastwood be right, chemists of eminence must be wrong. Let him read Fownes on the action of water on lead in his "Manual of Chemistry" p. 299. He will at once see the opinion and experience of that eminent chemist, viz, that if the water is pure it soon begins to act on the lead, and sooner or later the cistern will be destroyed. Hence, then, your first correspondent was correct, for unless a considerable quantity of carbonic acid be present, the lead is not acted on perceptibly. I should infer from his letter that he merely refers to the conveyance of water through leaden pipes rather than to its being stored in leaden cisterns, which surely now, owing to their great expense, are rarely used (certainly not in London houses). The wooden frame, lined with zinc, appears to me to be the accepted style amongst the London builders. The water indicated by your correspondent at Tunbridge Wells is not a fair specimen of water generally; that spoken of seems largely charged with iron in the form of carbonate, and I can understand that lead would be much quicker acted upon under these circumstances. Local circumstances ever will produce local effects, and here from the mere law of chemical affinity the lead would be acted upon through the large presence of carbonate of iron, even (your correspondent says) forming a sediment. But does not common reason say that water will never precipitate a body to take up another for which it has a less affinity, and unless carbonic acid be present, no action on the lead can or will take place? Is not the rain water spoken of turned (as your correspondent says it is) into the company's water to render it more suitable for domestic purposes, such as for washing and laundry purposes, or for taking up a large portion of the iron, and so preventing the carbonic acid being so largely in this present? Here the rain water, assimilating with the water supplied, soon alters its chemical character, and does not act consequently, as otherwise it would, on the lead.

Another correspondent asks of silicate of soda. Allow me to say silicate of soda is simply a salt of silica, with the base sodium. Strictly speaking, silica is an acid, capable, when heated, of forming with potash and soda, respectively silicates of potash and soda, and soluble to a certain extent in water. Now when a solution of silicate of soda is mixed with lime, by affinity we get a silicate of lime formed, like in the case of the manufacture of the Patent Victoria Stone, whose hardness is well known. If this silicate of soda be mixed with pointing mortar no doubt at all it will, in time, become adamant in hardness, giving out great efflorescence from the surface. I do not think for an instant, for smoothness of surface, it would be improved, save that when hardened by exposure to the atmosphere it would be capable of being highly polished, but, of course, this is not needed in mere joints, though perhaps useful in a flat and extended surface.

A PROFESSIONAL CHEMIST.

Leeds Architectural Society.—The annual dinner of this Society was fixed to be held on the 19th inst.

## CHURCH OF ST. THOMAS, LITCHURCH, DERBY.

On the 21st ult. the new church of St. Thomas, Litchurch, Derby, was consecrated by the Bishop of Lichfield. It has been built in memory of the Ven. Thomas Hill, B.D., late Archdeacon of Derby, at the cost of the Rev. Alfred and Mrs. Olivier (a daughter of the late Archdeacon). It is in the Norman style of architecture, with nave, aisles, and large and richly-decorated chancel. The body of the church is fitted with light open benches for 650 persons. The chancel is rich in detail, with reredos of polished alabaster, with eight moulded panels and piers terminating with boldly-carved angels, also in alabaster. Above is an arcade of five arches on polished marble shafts, with carved caps and moulded bases, in which are three windows and two spaces, with Decand stone; and above, a large wheel-window, divided with eight shafts, filling the whole of the gable end. The side windows are moulded, and with marble shafts, with bands and trefoil heads; and below are the credence and sedilia on deep-moulded arches. The roof of the chancel is circular, and, with the chancel fittings, is of pitch pine. The chancel is paved with Minton tiles. The font is of polished alabaster, set with spar and coloured marbles, and lined with lead. The pulpit has a stone base, with open oak moulded top, circular, with shafts and brass book-rest. The architect of the church is Mr. J. Peacock, of London; the builder, Mr. Hewett, of Leicester; the alabaster fittings having been done by Mr. Hall, of Derby. The east windows are filled with stained glass by Messrs. Mayer, of Munich, and represent "St. Thomas," "The Appearance to Mary Magdalene," and "The Angels at the Tomb"; and above, in the large wheel-window, "The Ascension."

## HULME.

The St. Philip's British Workman building is situated near the church, on a site formerly occupied by cottages, which have been revised and enlarged, and now afford complete facilities for a club, with care-taker's house attached. The ground-floor comprises rooms for billiards, reading, and games, and, in close proximity to these, a serving-room, which is fitted with a hoist.

The first-floor is one large room, 60 ft. by 22 ft., for public meetings (with a committee-room), and a separate entrance to this room is provided. The premises are heated by hot water.

The cost of building (exclusive of the site and fittings) is 1,300*l.*, and it has been erected by Mr. Hodgkinson, builder, under the superintendence of Mr. John Lowe, architect, Manchester.

## BUILDING PATENTS.\*

### APPLICATIONS FOR LETTERS PATENT.

76. J. H. Johnson, London. Domestic fire-places and stoves. (Com. by M. Perrett, Paris.) Jan. 6, 1882.

77. H. Reid, London. Machinery for moulding cement, &c., for paving and building. Jan. 6, 1882.

96. B. Collett, Willenhall. Lock and latch spindles, &c. Jan. 7, 1882.

112. H. J. Haddon, Kensington. Apparatus for making bricks. (Com. by L. Jäger, Ehrenfeld-Cöln, Germany.) Jan. 9, 1882.

119. E. R. Wethered, Woolwich. Window-sash fastenings. Jan. 9, 1882.

121. A. C. Engert, Bromley-by-Bow. Stoves or fire-grates. Jan. 9, 1882.

136. J. A. Slater and M. M. Bropley, London. Gas cooking apparatus. (Com. Spec.) Jan. 10, 1882.

162. A. T. Angell, London. Syphon traps for drains. Jan. 12, 1882.

172. J. Jackson, Kensington. Apparatus for mixing the materials used in the making of concrete. Jan. 12, 1882.

### NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Jan. 10, 1882.

4,595. J. G. Chillingworth, London. Sash-fasteners. Oct. 20, 1881.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

5,040. J. B. Petter, Yeovil. Stove and fire-places. Nov. 17, 1881.

Jan. 13, 1882.

4,551. G. E. Waring, Newport, U.S.A. Water-closets. Oct. 18, 1881.

5,111. J. R. Hargreaves, Haslingden. Water-fittings, &c., in houses. Nov. 23, 1881.

5,424. E. A. Rippingillie, Aston. Gas stoves Dec. 12, 1881.

5,543. C. F. Schlickeyeen, Berlin. Brick-moulding machines. Dec. 17, 1881.

### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending January 14, 1882.

1,302. T. Parker, Coalbrookdale. Grates and stoves for burning anthracite coal, &c.

The front of the grate has the usual bars, but the back sides and bottom are solid, and made of fire-clay. An opening is formed round the bottom, which communicates with a flue at the back of the grate. (Pro. Pro.) March 23, 1881. Price 2*d.*

1,690. W. G. Sloane and J. Sloane, Dublin. Apparatus for heating and ventilating Turkish baths, &c.

A double-walled chamber is formed, within the inner walls of which is the furnace, and the fresh air circulates between the two walls, being heated by the wall of the inner chamber. (Pro. Pro.) April 10, 1881. Price 2*d.*

2,342. F. Firth, J. Firth, and E. Firth, Dewsbury. Brickmaking machines.

This is an improvement on Patent No. 1,791, of 1878. The material is fed from a pug-mill into the mould-boxes of the forming table. The moulded brick at this table revolves is pushed out horizontally on to the movable bottom of another mould-box, which bottom then descends and carries the brick downwards into the box, when a plunger descends and compresses the brick. The plunger and the movable bottom afterwards rise, and the pressed brick is delivered out of the mould on to a travelling belt. May 27, 1881. Price 6*d.*

2,367. J. C. Dennert and G. G. Lind, Altona. Water-meters, &c.

A steering-rod slider inside the piston-rod, which is pushed to and fro by the reciprocating action of two spiral springs, and forms a parallelogram with the valve-rod by transverse arms fixed to the ends of both rods. Discs are attached to the valve-rod to open or close the water passages which lead into the cylinder and actuate the piston. May 30, 1881. Price 6*d.*

2,422. W. R. Lake, London. Fluid meter.

In a cylinder works the piston. The liquid is alternately admitted at each end of the cylinder, and the distributing chamber above is so arranged that all the parts are easily accessible. It contains four clock valves, so fitted that, while two are open, the other two are shut. These are actuated by the piston-rod, which also actuates the counting mechanism. (Com. by J. E. Jacquet, Paris.) June 1, 1881. Price 6*d.*

2,453. J. Herd, Birmingham. Roadways, pavements, &c.

The roadways are formed of blocks or sets of concrete, &c., faced with asphalt. In the asphalt, while it is in the liquid state, has been placed a grating of iron, so formed that where the bars of the gratings intersect one another, the crosses stand above the level of the asphalt, while the rest of the bars are under the surface thereof. This affords a foothold for horses, &c. June 3, 1881. Price 6*d.*

2,536. L. W. Beck, Duffel, Belgium. Drying ceramic products and bricks.

The bricks, &c., are wrapped in some porous material, such as felt, before being exposed to the heat in the kiln. (Pro. Pro.) June 10, 1881. Price 2*d.*

2,686. A. Damman and A. Cassard, Brussels. Parquet flooring.

A base of stone or cement, &c., is first laid, over which is placed a layer of bitumen, gutta-percha, or asphalt, &c., and then the covering of wood, worked into any desired pattern. June 20, 1881. Price 6*d.*

## WATER SUPPLY.

Stroud.—Mr. Harrison, C.E., an inspector from the office of the Local Government Board, has held an inquiry at the office of the clerk of the Local Board, in consequence of an application by the Board for power to borrow an additional 2,500*l.* for the purpose of constructing a storage reservoir. Mr. Anstie, the engineer of the projected Stroud Water Company, with Mr. R. H. Smith, the solicitor, attended in opposition. Mr. Witohell, clerk of the Board, gave the necessary formal evidence as to the rateable value, amount of mortgage, &c., and Mr. Lofthouse, the engineer and surveyor of the Board, produced the plans of the proposed new reservoir, and gave evidence in detail of the cost of the works and particulars of the water supply. He said the supply at the upper reservoir had been increased from 100,000 to 250,000 gallons a day, and it was necessary to have a storage reservoir to provide for the dry season. In the course of his examination he stated that the supply was on the intermittent system, upon which the inspector expressed himself strongly against this system, and said he should recommend as strongly as he could that the Board be required



to obtain a constant supply. It was pointed out that the mains and fittings were only suitable for the intermittent system, but the inspector said there was no reason whatever in Stroud why the service should not be constant. Mr. Smith cross-examined Mr. Lofthouse as to the sufficiency of the present water supply, and said he appeared for the Stroud Water Company, but the inspector refused to hear him in that capacity. He said a rival company had no *locus standi*, as the Board were bound to supply their district with water, and he intimated that Mr. Smith's admission that the supply was insufficient was proof of the necessity of the present application. The inquiry terminated, the inspector saying he should make his report next week, and Mr. Witcomb saying the Board would meet next week, and would probably pass a resolution on the hint thrown out as to a constant supply.

**Carnoustie.**—The new water-works at Carnoustie, near Dundee, have been opened. The scheme, of which Mr. McCulloch, of Dundee, is the engineer, is what is known as an underground one,—that is, the water, instead of being collected on the surface in the usual way, is all collected below ground. The nucleus of the supply consisted of what used to be known as the Brax Spring, one of the feeders of the Lochty Burn. This spring rose in a disused quarry. About 1,500 lineal feet of adits have been cut into the water-bearing strata of the upper bed of the old red sandstone formation, at an average depth of 12 ft. 6 in. Into these fire-clay pipes have been laid, and surrounded by a filtering medium, consisting of broken red sandstone, several layers of washed gravel, sand, and coke, of a total depth of 3 ft. The water from two of these adits, of an aggregate length of about 800 ft., is led to the reservoir at a distance of about 400 yards off, in cast-iron pipes, provided with sluice valves to admit of the water either from the one or the other singly or from both combined being discharged into the reservoir, or past it direct to the village. The water from the remainder of the adits, being at too low a level to discharge into the reservoir, is conveyed by fireclay pipes to a collecting well adjoining the reservoir. The reservoir has been formed by excavating in a natural hollow, the excavated material being thrown upon the four sides to form the embankments. It is 270 ft. square at the top by from 19 ft. to 20 ft. deep, and contains above the top of the outlet-pipe to the top of the overflow a little over 6,000,000 gallons. There being no clay on the site of the reservoir, the usual method of rendering the reservoir water-tight by forming a thick puddle-wall in the centre of each of the embankments has not been followed. Instead thereof the inner slopes of the embankments are lined throughout with concrete 8 in. thick, backed by clay puddle 6 in. thick on the made ground. Offers were invited for the construction of the works in five separate contracts, but the offers of Mr. George Mackay, contractor, Broughty Ferry, were accepted for the whole of these. Messrs. Robert Macdonald & Co., Eglinton Foundry, Glasgow, supplied the iron pipes. The Glenfield Company, of Kilmarnock and Paris, supplied the special castings, sluice and air valves. Mr. Robert Gellately, Loches, acted at the outset as the inspector of works, but was laid aside from ill-health. The works have since been superintended by Mr. David Peter, inspector of works, Dundee. The total cost has been about 7,000l.

#### DEPTH AND DRAINAGE OF BASEMENTS.

DEASS V. THE VESTRY OF PADDINGTON.

This is an action by Mr. Braas, a builder, and Mr. William Whiteley, of Westbourne-grove, his employer, in order to restrain the defendants from demolishing or altering four warehouses recently erected by the plaintiffs in Queen's-road, Bayswater, and from altering the levels of the foundations or interfering with the drains of those warehouses.

It appears that Mr. Whiteley, having built in the Queen's-road four warehouses with basement levels at a depth of about 9 ft. below the surface of the Queen's-road, was proceeding to build four more the basements of which were at a depth varying, by reason of the roadway not being level, from 7 ft. 6 in. to 8 ft. 3 in., when he was served by the defendants with notice that they had made an order that the levels of the foundations of these new warehouses should not be more than 7 ft. below the surface of the roadway, and that the warehouses should be drained in a manner specified in this notice. Mr.

Whiteley appealed against this order to the Metropolitan Board of Works, but his appeal was dismissed, and, being advised that the defendants had no power to prevent him laying his foundations at any depth, provided that such depth would permit drainage in compliance with the Acts, he brought the present action.

Mr. W. Pearson, Q.C., and Mr. Farwell, for the defendants, now moved (before Vice-Chancellor Hall), under the second rule of the 24th of the orders under the Judicature Act, that before any evidence was given in this action the questions of law therein might be decided,—namely, whether the Court had any jurisdiction to interfere with the defendants in the exercise of the discretion given them by statute, and, if so, whether the matter was not concluded by the decision of the Metropolitan Board of Works on the appeal.

The Vice-Chancellor, without calling on the counsel for the plaintiffs, said that on such an application as the present he must be satisfied that there was some question of law in the action which it would be convenient to have tried before any evidence was given. Now, it was part of the case raised by the plaintiffs that the Vestry had used the powers conferred upon them in a vexatious and oppressive manner, and his Lordship could not for the purposes of this application say that there might not be substance in that averment as to which facts might be material. The question was one of vital importance to the plaintiff, looking at the state of the property, both when the notice was given and now that the buildings were completed, and, not being satisfied as to the convenience of first trying any question of law in this action, he must refuse the motion, with costs.

#### OBITUARY.

Sir Daniel Macnee, President of the Royal Scottish Academy, died in Edinburgh on Tuesday night, aged 75. He was elected a member of the Academy in 1829, and was elected its president in 1876, in which year he also received the honour of knighthood.

Mr. Joseph Edwards, the Welsh sculptor, who died a few days ago at his house in Robert-street, Hampstead-road, where he had lived and worked for forty years, was an artist of no mean powers. He began to exhibit at the Royal Academy in 1838, and from that date his work was scarcely ever absent from the annual exhibitions of that body until 1861, in which year he became an assistant to Noble, who was, in the view of most critics, inferior to Edwards as an artist. It is within our own knowledge that much of the best work in Noble's public statues is due to Edwards. After Noble's death Edwards again came forward as a frequent exhibitor. His independent work consisted mainly of busts and small monuments, though occasionally he attempted more ambitious ideal work,—as, for example, his "Dying Christian's Dream," executed in 1848.

M. Charles Blanc, of Paris, well known as an art critic, died on Tuesday from the effects of an operation for tumour. Born at Caestre in 1813, he was brought up as an engraver, but early in his career devoted himself to art criticism. From 1848 to 1852 he held the post of Director of Fine Arts. In 1858 he was admitted a member of the Academy of Fine Arts, and a few years ago he was nominated to a newly-created professorship of *Esthetics* at the Collège de France. He was the elder brother of M. Louis Blanc, but never took part in political movements. Reports of his lectures will be found in our pages.

Signor Giovanni Dupré, one of the most celebrated and best-known of Italian sculptors, died on the 10th inst., at his residence in Florence, after a short and painful illness, aged 64. He was a self-made man, and to the possession of innate talent he added an assiduity of application which led to his success in spite of the severest discouragements and trials. He was born in Siena in March, 1817. In his fourth year, his family removed to Florence, where the father of Dupré attempted to gain a living as "intagliatore," i.e., inlay in wood,—a trade he had learned when young. Finding little to do in Florence, he repaired to Pistoja, making occasional visits to Florence. The child Giovanni showed, from his boyhood, a marked taste for sculpture, which led the father to place him with Angiolo Barbetti, the clever carver in wood, whose workshops were in Siena. Dupré afterwards studied in the Academy of Fine Arts in Florence, and then worked in the studio of Professor Macchi. His first work exhibited was a female head, called "Santa Filomena." This was placed in the Academy in 1838, and received the praises of Bartolini. In 1842

Dupré modelled his famous statue of Abel, now in the Pitti Palace. From that time his fame and fortune steadily increased, his country acknowledging his merits and lavishing honours and gifts on him. He leaves two daughters, one of whom is spoken of as a clever sculptress. His great regret during his illness was that he should leave unfinished the colossal statue of the Virgin he had begun, and which was to be placed over the grand entrance of the new facade of the cathedral. Fifty-five years ago he might have been seen bending under a load of shavings intended for his master's fire, unnoticed and unknown to all, as he relates in his memoirs, and crossing the very bridge over which his sad and solemn funeral procession drew together half the population of Florence. Since he had attained to fame and fortune he was always ready to help struggling artists, with whose trials he was so familiar in his own person.

Signor Giuseppe Inconorati.—The death of Signor Giuseppe Inconorati occurred on the 14th inst., in London, where he had resided for considerably over half a century, during which period he formed a link with the artistic English colony of the Rome of the commencement of this century. The oldest foreign friend of Sir Charles Eastlake, who more than sixty years ago resided in Rome in the house of Inconorati, and who, until his death, entertained for him the warmest regard, an esteem continued by his widow, Lady Eastlake; the oldest foreign friend of John Gibson, of C.R. Cookerell, of Boxall, and of Joseph Bonomi, Inconorati was an interesting member of a group of Anglo-Roman artists, which, perhaps, only Mr. Perry Williams now remains to represent. When the Prince of Wales visited Italy for the first time, Inconorati was his teacher in Italian, this having for many years previously been the profession by which he accumulated the means of independence that allowed him to pursue the devoted aim of his life, the study of classic literature.

#### NATIONAL HISTORY GALLERY.

Sir,—Mr. W. Cave Thomas, when suggesting "the erection of a National History Gallery, to contain a series of historical paintings illustrating the most important incidents in the various periods of English history," apparently ignores the dearth of historical painters England has always, and is now, exhibiting; and the existence of the "National Portrait Gallery."

This gallery certainly fulfils all that is required in the way of a history collection, as regards the notable personages of the "various periods of English history"; pictures representing "its most important incidents," i.e., historical paintings, we are so deficient in, that I doubt if there could be got together, in a reasonable time, sufficient to make a decent beginning for an exhibition. As an adjunct to the National Portrait Gallery, such a collection of "historical paintings" as Mr. Thomas suggests would be an admirable addition. While giving increased interest to the gallery, they would find their legitimate home there, were the title of the above gallery modified to include them. In other words, I would not advocate the formation of another picture gallery, but would enlarge the one in actual existence to include Mr. Thomas's scheme. For these reasons, the present National Portrait Gallery would form a good nucleus for a "History Gallery," since it is so already in one phase,—that of portraiture. The gallery has a most efficient and energetic keeper, whose whole heart is in his work, and, moreover, since the Government is apparently unable to support one gallery properly (for several months now, the upstairs long gallery has been closed for repairs and alterations, which, however, are not carried out for "want of funds"), it would be still less able to bear the expense of two.

But while thus advocating the introduction of new features into the National Portrait Gallery, it should not be housed in the miserable shed it is now, but its treasures should be placed in a building constructed with consummate skill and taste, the whole being designed as an ornament to London. Alas! when can we hope such a building will be given us? Can we expect one when we are content to have a "National" Gallery, sneeringly alluded to as a duncheon with "pepper-casters" for towers; a South Kensington Museum little better than a builder's yard, with its unfinished buildings, tumble-down old houses, and ramshackle iron-roofed sheds; and a "National" Portrait Gallery little better than a row of stables? Must we put up with these buildings as they are? Where would the present crazy wooden shed be should it catch fire (no improbable idea, as has already occurred once in one of its safest rooms)? What could save it from being entirely consumed?

H. C. STANDAGE.



### THE BUILDING TRADE AND THE PROGRESS OF BARNSELEY IN 1881.

BARNSELEY, so well known as the coal metropolis of South Yorkshire, has, like many other places, not found so much employment for builders and kindred trades, yet it has not stood still, the buildings for which plans have been passed by the Town Council having numbered 178 against 192 in the previous year. Of these seventy-three were houses, seven shops, three public buildings, twenty-six mills and workshops, and sixty-nine buildings of other descriptions. Since 1875 the erection of buildings declined. In that year no fewer than 519 proposed buildings were sanctioned. Since the year 1868 there have been 4,667 buildings passed, so that some idea of the progress made may be gleaned from that statement. The most interesting feature of the year will doubtless consist of the works connected with the three public buildings now in course of erection, consisting of a new post-office, a large infirmary, and an additional wing to the Beckett Hospital and Dispensary. Taking the new post-office first, it may be stated that for many years its duties were discharged in the Commercial Buildings, Church-street, now used by the Yorkshire Banking Company. A removal was made to the Old County Court, at the bottom of Regent-street, where the business is still carried on until the new buildings are completed. The new offices are being built upon a plot of 408 square yards of land at the top of Regent-street, which the Post-office authorities purchased from the Corporation at the cost of 4l. per yard. The building is being erected from plans furnished by Mr. Williams, surveyor to her Majesty's Board of Works, and is, barring minor variations, the same as similar buildings recently erected at Stockton-on-Tees, Scarborough, and other places of similar size to Barnsley. The style of architecture adopted is Italian Renaissance. The building will consist at the front of two lofty stories, the height to the top of the parapet being 42 ft., and having a 42 ft. frontage to the street. It will be exactly four-square, with two entrances at the front, with a couple of large windows between them. In the upper story there are to be four large windows, with stone balusters in front, and surmounted by corbices. The whole of the front is to be of dressed stone, and the base is of rustic work. The whole of the front and back is of stone obtained from the Warwick quarries. The side walls are of red brick from the works of Mr. Platts, of Oldham. The public office, which is on the left, is approached by an 8-ft. passage, and measures 30 ft. by 21 ft. 6 in., and has a counter rising along its entire length. Immediately adjoining is a private office for the post-master. The sorters' room, measuring 63 ft. 9 in. by 25 ft., is at the rear of the public offices. It will be lighted from the roof, and the basement will contain linemen's work-room, telegraph store-room, &c. The telegraphic depot will be on the second story, over the front office. According to the tender, the work is to be completed by June next.

The next most important erection is a large infirmary, which is being built by Messrs. Hinchcliffe & Moore, for the Barnsley Union Authorities, in a field near the present workhouse, which is situate a short distance from the town. The plans have been prepared by Messrs. Dixon & Moxon, architects, of Barnsley; and the buildings, which are progressing, are, according to the terms of the tender, to be completed by the end of June, 1882. The tender of Messrs. Hinchcliffe & Moore was accepted. The amount was 15,687l. 5s. if built entirely of Brighouse stone, and 15,197l. 12s. if local stone was allowed to be partly used. The latter tender was accepted. The tenders varied a good deal; some reaching as high as 23,374l. for Brighouse stone.

The work in connexion with a new "medical wing" at the Beckett Hospital and Dispensary is also progressing. Mrs. Lambert, of London, a lady interested in the prosperity of the town, has contributed 2,000l., and the late Mrs. Allen, of Brighton, 1,000l. The site, which is on the west side of the existing building, has been purchased from Sir H. Bacon at 4s. per yard, and that gentleman has intimated his intention of subscribing 250l. towards the new extension.

The state of trade has during the year been depressed, and this has to a great extent interfered with building operations. At one period of the year there was a large number of cottages untenant.

### SURVEYORS OF ECCLESIASTICAL DILAPIDATIONS.

At a meeting of the archdeacons and rural deans of the Diocese of St. Alban's, recently held under the presidency of the Bishop, the following gentlemen were appointed Surveyors of Ecclesiastical Dilapidations for the term of five years, from the 5th of December, 1881:—

Mr. Gordon M. Hills, of No. 4, Adam-street, Adelphi.  
Mr. Frederick Chancellor, of Chelmsford.  
Mr. E. J. Dampier, of No. 11, St. John-st., Colchester.  
Mr. J. E. K. Cuts, of No. 28, Southampton-street, Strand, London.  
Mr. S. E. C. Streetfield, of No. 39, Great Marlborough-st.  
Mr. C. G. Vinal, of No. 43, Guildford-st., Russell-sq.

### THE METEOROLOGICAL SOCIETY.

The annual general meeting of this Society was held on Wednesday evening last, in the hall of the Institution of Civil Engineers, Mr. G. J. Symons, F.R.S., president, in the chair.

The Secretary read the report of the Council for the past year, which showed the Society to be in a very flourishing condition, for while, in 1871, the Society continued its work without an office, accessible library, or an assistant-secretary, and the number of the Fellows was 314, the staff at present, very fully employed, consists of an assistant-secretary and three computers, and there are 555 Fellows on the roll. The receipts and expenditure in 1871 show a marked contrast to those of the past year. The receipts, ten years ago, amounted to only 244l., against more than 840l. in 1881. The expenditure was only 197l. in 1871, against 780l. in 1881. The Society also now receives second order and climatological observations from eighty-three stations, the results of which are published quarterly in the "Meteorological Record." In addition to the "Quarterly Journal," two publications have been prepared and issued under the direction of the Council, viz., "Hints to Meteorological Observers, with Instructions for Taking Observations, and Tables for their Reduction"; and "Index to the Publications of the English Meteorological Societies, 1839 to 1881."

The President (Mr. Symons) then delivered his address, which was devoted to the consideration of the present state and future prospects of meteorology. He began by asking in what respects is our present system of observation capable of improvement? Should it be extended, either as regards distribution of stations, additional instruments, or additional hours of observation? Can any of the millions of entries at present made annually be safely dispensed with? These questions can only be properly answered after considering two others,—what observations are being made, and for what object? After referring to the different patterns of barometers and the number of observations made, Mr. Symons said he was aware there are several grounds upon which the maintenance of numbers of stations in excess of all possible requirements could be defended. In the first place, there is the constant difficulty which arises from the removals and deaths of the observers, and from the extension of buildings and growth of trees, &c. This renders it necessary that there should be two or three stations wherever it was desired to make sure of a continuous record. But a far better and more scientific plan would be to choose a few unexceptionable localities remote from towns, purchase the freehold of a few surrounding acres, erect thereon stations identical in design and in every respect, and endow them with moderate funds, so that the observations may, humanly speaking, be established on an unalterable basis. For climatic purposes the numerous climatological stations started by the Society are of great value. After speaking of hygrometers, anemometers, and ozonometers, the President referred to daily maps of Atlantic weather, which should be on a scale of not less than 1 in. for 100 miles. The compilation of such charts is an essentially national work, and falls wholly within the domain of the Government Office. After referring to weather forecasts, the lack of original workers in discussing meteorological observations, the absence of academical encouragement, and the little prospect of those who devote themselves to meteorology obtaining more than a bare livelihood, the President concluded as follows:—"It is just possible that the severe manner in which I have criticised a few of our existing arrangements may have led some one to consider that meteorology is languishing, feeble, or even moribund. I believe that the very contrary is the fact. When a case is

weak, one hesitates to point out its weaknesses for fear of a total collapse. No. The Meteorological Society never advanced so rapidly in numbers as it has in the two last years, and if it will but apply the pruning-knife to fruitless observations, and try to secure the application of more brain power to the many problems yet unsolved, it will continue to receive an ever-increasing amount of recognition and support, and to maintain that high position among kindred societies which it at present holds."

The officers and council for the ensuing year were then elected.

### CHIMNEY STAYS.

SIR,—The practice of supporting lofty chimney-stacks by means of iron rods is so common, and it is becoming more so under the more strict discipline of "dangerous structures," that I think some one ought to point out to builders generally how useless their iron rods commonly are. If the wind would enter into an agreement with us to blow in one direction, and not in another, then the customary tie-rod hooked on to a strap might answer very well; it keeps the chimney secure against a gust blowing from the anchor of the rod towards the chimney; but manifestly, if the stay is to secure the chimney against a gust in the opposite direction as well, coming from the chimney towards the anchor, then the rod must be, not a tie, but a strut. Therefore, every stay ought to serve both purposes. In order to do so, all that is required is that it shall be of sufficient substance and rigidly fixed. As a rule, I venture to say it ought in ordinary cases to be a 2-in. bar, or an angle iron set like the letter V, or preferably like A. Being, of course, malleable iron, not cast, such a stay will act both as tie and strut. I need scarcely add that, when the chimney is already leaning over, the tie-rod is legitimately used if acting in the right direction; but this is another question altogether as regards both construction and expediency.

ROBERT KERR, District Surveyor.

### SKILLED LABOUR.

SIR,—The article on the above in your issue of January 7th, although treating largely on the matter, and very worthy of the attention of artisans of all trades, does not, in my opinion, sufficiently represent the subject.

As clerk of works for an extensive building, with twenty years' experience as workman and foreman with an eminent London building firm previously, I may perhaps be permitted to give a reply to some of your very able remarks thereon. Mine was one of the very few firms that pay full wages, and, therefore, employ efficient workmen, and I may add, use good materials, and are always well employed by those that have by experience found that the best, although the more costly at first, is much the cheapest in the end.

Technical education, so much talked of at present, will not of itself bring the mason, bricklayer, carpenter, or any working mechanic, up to the standard of fifty years ago, much less to that of the men who prepared and fixed the admirable roofs named by you.

It is not the theoretical but practical knowledge that enables the workman to execute his work in an efficient manner. It is an old saying, but a very true one, that those that talk most of their work are the least efficient; and this may be said of many at present that take their apprenticeship principally from books in lieu of actual practice.

But there is at present little encouragement for the better workman in either trade; cheap labour is the prevailing element, few builders or employers of any trade paying the acknowledged price for labour, and the better workman invariably finding that his fellow-workman at less wages gets the preference, although taking much more time, and often spoiling materials.

Many employers of labour in the building and other trades will probably find eventually that the cheapest labour is the most costly. The cheap labour is daily on the increase, both in quantity and inferiority. Owners of property will also soon find the cost of repairs equal the rents in many of the houses recently built; but the future generation will come in for the worst share in this respect, not tending the cost of medical attendance consequent on defective drains and damp arising from basements and through walls and the ever-faulty roofs.

Many of the men that are employed by speculative builders were never apprenticed to either trade. They may be termed the Jacks-of-all-trades, as they learn a little of masonry, bricklaying, and carpentry, and also plumbing; the latter is, no doubt, keeping pace with any of the former. Many of these Jacks-of-all-trades are always on the look-out for the best market in either branch, and, as I before stated, get mated with the better men. They are always well prepared to state that they have worked at



some of the most important buildings, and are, consequently, taken on by foremen to fill up vacancies, and often put with reasonably practical men.

This is very degrading to the qualified workman, who, by the way, is, in most cases, blamed for any errors in the work and spoiled materials; so that the better workman is not only, under the present system, obliged to instruct his worthless mate, but has also to bear the blame of his errors. The foreman soon finds which of the two is the better workman, and consequently gives his orders accordingly. He is obliged to do this, the better to enable him to cope with the mass of inferior and impractical labour he has frequently to contend with.

This is the general practice at present in most of the building firms that contract for work, especially those that accept contracts at one-third less, and sometimes half what the few good firms quote. A glance at the lists of tenders explains this sufficiently for any practical or business man.

Any architect or proprietor that accepts the lowest tender in such cases may conclude that the vast difference can only be met by the employment of cheap labour and use of inferior materials; therefore those who accept such tenders not only encourage the detestable system of cheap labour and materials, but are themselves cheated from the very commencement to the "supposed" finish of the building, and this the proprietor finds out to his cost shortly afterwards, in the continuous bills for repairs. This, therefore, encourages the employers of unskilled labour and inferior materials, and the qualified workman finds that his abilities are quite unvalued for, except as before named.

But this degrading state of the building and other trades has injurious effects in other ways. It has caused many good and respectable mechanics, after years of patient toil and trial, to give way to intemperate habits, whereby their families also are sufferers.

I feel sure many experienced clerks of works and foremen will bear me out in my statements herein contained. The duties of a clerk of works are daily becoming more arduous. The mass of inferior labour and materials that comes under his notice almost makes him forget what good workmanship and materials really are. His duties in many cases, in trying to obtain justice for his employer, are perfect slavery. A CLERK OF WORKS.

#### SLATE REFUSE.

SIR,—There is a modern invention for the utilisation of slate refuse, and the use of the refuse of slate quarries, in the formation of solid blocks. I shall be glad to hear where I can find any description of the process. J. W.

#### NEW ROADS AND THE BOARD OF WORKS.

At the Clerkenwell Police-court on the 18th inst., Messrs. Stead Bros., of Chalk Farm-road, builders, appeared at the instance of the Metropolitan Board of Works, to be convicted in a penalty for not making a street open at both ends.

The facts of the case were these.—Messrs. Stead Brothers laid out an estate called the Wedmore Park Estate, Upper Holloway, for building purposes, the west end of the street opening upon ground which did not belong to them, and they erected a barrier at the end of their own land. The Metropolitan Board of Works summoned them for this, and the summons was heard before Mr. Hosack on the 12th of April last, when the Board was represented by Mr. Burton, solicitor; Mr. Underwood, solicitor, appearing for the defendants.

Mr. Underwood contended:—(1.) That the 25 & 26 Vict., c. 102, s. 93, did not require the street to be open at both ends. (2.) That the by-laws of the Board were bad, as being repugnant to law. (3.) That the Board were not in time in taking their proceedings. (4.) That the said by-laws were bad, as being restrictive of trade.

Upon this contention, Mr. Hosack dismissed the summons, but granted a case for a superior court; and the matter came on for hearing before the Queen's Bench Division of the High Court of Justice, on the 7th day of December last, before Mr. Justice Grove and Mr. Justice Lopes.

Mr. Biron appeared for the Board; Mr. Poland for the respondents.

After the arguments were heard on both sides, the Judges stated it was a very important case; and, as there was a difference of opinion between them, the case must be re-argued when there were three Judges present.

The case came on for hearing again on the 13th day of December, Mr. Justice Grove stating that the Judges had now made up their minds, without further argument, and held that the 93rd section did apply, and dismissed the appeal with costs. The other points were not argued.

The section of the Act under which the respondents were convicted reads shortly thus:—After providing that streets for carriage and foot traffic shall be respectively 40 ft. and 20 ft. wide, it goes on to enact, or unless such streets respectively shall be open from the ground upwards; and by the decision in this case the word "or" will in future be read as "nor," and all streets must be of the statutory width, and open at both ends thereof.

#### Books.

*The Practical Guide for Inspectors of Nuisances.* By F. R. WILSON, F.R.I.B.A. London: Knight & Co. 1881.

Mr. F. R. WILSON, the author of this little book, has been for some time the Inspector of Nuisances and Surveyor for the Rural Sanitary Authority of the Union of Alnwick, and chairman of the Burial Board of the same district; so that he has found out practically what inspectors want to know, and what he says is the result of practical experience. Besides supplying notes of information to enable an officer to overcome the difficulties attending the due discharge of his office, he puts forward various suggestions, some of them very valuable, so that the book will be found useful not alone by newly-appointed surveyors, but by many who have long held the office. Lists of books and acts required under the Health Acts, and of recent works bearing on local government, are given at the close of the volume.

#### Miscellaneous.

"Asbestos Fireproof Paint."—On Saturday last some experiments were made in the grounds of the Crystal Palace with asbestos paint, in order to test its qualities as a protective covering against fire. This paint is described as a new and special preparation of asbestos, and is being introduced by the United Asbestos Company, of Queen Victoria-street. The asbestos is a finely-divided state is mixed with a fluid material, and is used in a similar manner to other paints. Unlike them, however, it is unflammable, and is capable of communicating this valuable attribute to such substances as may be covered with it. It was to demonstrate this valuable feature that the experiments were carried out, Captain Shaw being present. The first experiment consisted in submitting to the action of fire some linen, cotton, and gauze fabrics which had been partially treated with the paint. On setting fire to them the unprotected portions quickly blazed away into tinder, the protected parts remaining intact. The next experiment consisted in placing on one part of a floor fire some blocks of wood painted with asbestos paint, and on another part similar blocks of wood not painted. In the course of a short time the unpainted blocks were entirely consumed, while those which were painted resisted the action of the fire for a long time without showing signs of deterioration. At length, however, the fierce heat of the fire raised some blisters, which on bursting admitted the intense heat, which charred the wood, the external coating of paint, however, being greatly preserved. In the final experiments four timber erections were employed, two being about 12 ft. wide by 8 ft. deep and 10 ft. high, and representing theatrical stages with ropes, curtains, and effects. The other two were open-timber sheds, about 6 ft. square in plan, and 8 ft. high. One of each of these two classes of structures was protected with the asbestos paint, the other two being of plain timber. Piles of shavings and other inflammable materials were placed under and upon the floor of each structure, and lights were applied to all simultaneously. The unprotected stage quickly caught fire, and in about twelve minutes it was a heap of blazing ruins. The unprotected shed, being open-sided, did not take fire so soon nor burn so rapidly, but the flames eventually got hold of it. Both the protected stage and shed resisted the effects of fire to the end most successfully.

**Birkenhead Town-hall Competition.**—We have looked through the conditions, and fail to discover the vagueness complained of by a competitor who wrote to us last week. Another correspondent had complained that the arrangements would not prevent any member of the Council, who was a competitor, from studying all the sketch-designs sent in, and, if himself one of the selected five, making use of the information thus acquired. We are unwilling to have anything to do with such mean suspicions. The Town Council have called to their assistance a capable and honourable architect, and have given every reason to make us believe that they desire to act honourably.—Another correspondent, "One of the 150," has addressed to us some similar anticipatory objections, but we must repeat that we see at present no reason to suspect the Town Council of a desire to act unfairly.

**Before the Deluge.**—On Monday evening last, at the Victoria Institute, Mr. Rassam, in giving some particulars of one of his latest finds in the neighbourhood of Bagdad, said:—We first of all discovered four rooms, and then came upon a fifth. They were what I should call generally of the Assyrian or Babylonian order, and paved with bricks or stones, but the fifth room was paved with asphalt, the discovery of which brought to my mind Solomon's saying: "There is nothing new under the sun." Previously to this I had always thought that asphalt was a modern invention. Singular as this discovery was, we dug through the asphalt, and in a short time we were rewarded by coming upon a coffer, on which we found inscriptions. From this coffer we took two cylinders. These were covered with inscriptions, which are supposed to be the most important records of the oldest city in the world, founded, as historians tell us, by Noah, after the Deluge, and where, according to tradition, Noah buried the antediluvian records. Well, I had to come home, but I left some workmen continuing the operations at the spot, and I have ascertained that they have found, after a few days' more digging, that in one of the rooms there was a channel, and inside that channel there were records inscribed on nearly 10,000 tablets. These tablets are all coming to England, but we cannot, of course, as yet say what they contain. They may contain something of even greater value than anything that has hitherto been discovered in the course of our Eastern researches. It may be, indeed, that we shall really find in them the antediluvian records of which I have spoken.

**The Orange-Peel Nuisance.**—"Observer" writes,—I look for my Builder, and have looked for it for years, as I wait for matutinal coast, and was glad to see in your issue of the 7th inst. the "orange-peel" horror taken up by a journal of your influence. My brother had his leg broken, and I have had mine crushed, and six partial local injuries, so I speak *en cathedra*. Some five years ago, I proposed "An Orange-Peel" Brigade of little boys (street Arabs, say), with yellow or red wool jackets, &c., to clear the pavements incessantly from eight to eight, in all leading thoroughfares, by picking up the peel; these boys to be paid a small salary, and so much per cwt. on all peel brought to my office, payments being made by philanthropic and vestry and City authorities. Now, sir, this would clear the streets perfectly; money will do marvels, but you cannot make people "goody-goody," nor careful; but a poll-tax, or head money, will clear rats, tigers, wolves, or most evils. All green vegetable refuse is dangerous on pavements; but orange-peel worse than all, from its peculiarly spongy, greasy, slippery texture. There is some kind of dye or chemical use it can be put to; in Paris it is used to a vast extent, and has a marketable value. Many poob-poo and laugh at the matter, but the hospitals could tell some tales of accidents to porters, builders, aged people, children, blind persons, and even the stalwart, which would grieve one's heart to hear.

**Sheffield School of Art.**—I have herewith sent you the results of the Goldsmiths' Company's competition so far as Sheffield School of Art is concerned. I am pleased to be able to say that Sheffield has taken more awards than any other town in the kingdom, with the exception of London, although a large number competed. I think the manufacturers of Sheffield should, if possible, be made to understand that this is a thoroughly technical examination, bearing directly on the artistic development of the Sheffield trades, and that Sheffield may be congratulated on having done so well, and I should esteem it a great favour if you would use your influence in doing so. The results are:—1st prize of 20*l*., design for large silver salt cellar, Robert Needham; 1st prize of 10*l*., design for small silver salt cellar, E. Thickett; 1st prize of 20*l*., design for silver dessert stand, Robert Needham; 2nd prize of 10*l*., design for tankard, E. Hoyland.—JOHN T. COOK.

**Ryton-upon-Tyne.**—Mr. J. J. Lish, architect, of Newcastle-upon-Tyne, has been called in by the Ryton Local Board to design and superintend the erection of the new cemetery works about to be carried out at Ryton. An excellent site, containing between five and six acres, has been secured to the south of the village, and we understand that the works are to be proceeded with at once.

**Electric Light for the West End.**—Preparations are being made for lighting Waterloo-place and Regent-street with electric light.



**Art in Manchester.**—The annual meeting of the members of the Manchester Academy of Fine Arts was held at the Royal Institution, Mosley-street, the president, Mr. R. Crozier, in the chair. Mr. H. H. Hadfield, hon. secretary, read the annual report, in which the council stated that they had pleasure in being able to present a favourable statement of the present condition of the institution. The last exhibition, they ventured to say, excelled all former ones, both as to the general quality and number of works sent in, whilst the sales effected, notwithstanding the depression of trade, far exceeded those of the preceding exhibition. The academy at present consisted of 13 honorary and 47 ordinary members, 28 associates, and 14 lady exhibitors, whilst there were also 25 lady and 37 gentlemen students. The following was a list of the elections of members, associates, &c., during the year, viz.—Hon. members, Messrs. A. Waterhouse, A.R.A., and T. Armstrong, the latter, a Manchester man, having been recently appointed Art Director of the South Kensington Museum; ordinary members, Mr. R. Collinson; associates, Messrs. R. Langton and J. Jackson; and as a lady exhibitor, Miss Juliana C. Shepherd. Their ranks had sustained a great loss by the sudden death of Mr. Selim Rothwell, one of the oldest members of the academy, and one who for so many years did it valuable and faithful service, first as honorary and afterwards as literary secretary. Mr. Ward Hoys, treasurer, made his annual statement. The year was begun with a balance in hand of 125*l*. The annual subscriptions amounted to 178*l*. 13*s*.; and amongst the other items of receipt was 7*l*. from commission on sale of pictures, which was considerably in excess of last year. The disbursements left a balance to credit at the close of the year of 188*l*. 3*s*. 10*d*. The adoption of the report was moved by Mr. Moxon Cooke, seconded by Mr. J. H. Hague, and unanimously agreed to. The president then delivered an address.—The Manchester Society of Women Painters have an exhibition of their works now open in the Old Town Hall.

**The New Church Institute at Maidstone.**—The erection of a building in Union-street, Maidstone, for the Church Institute, in place of the inadequate accommodation at present afforded by the rooms in Week-street, will shortly be commenced, the tender of Messrs. Wallis & Clements, of that town, having been accepted. In consequence of want of funds only a part of the structure originally contemplated will be built, but the portion now to be erected will comprise a reading-room, 30 ft. by 20 ft., three class-rooms, one of which will be used as a temporary library, and living-rooms for the steward, with bedroom accommodation above. The style will be the fourteenth-century Domestic Gothic, and the building will have a frontage to the street of 42 ft., and will be 48 ft. high. It will be built of red brick with Bath stone dressings. At some future time, when more money has been subscribed, the original plan will be completed, and the accommodation proposed then to be added will include a gymnasium, 33 ft. 6 in. by 29 ft.; a permanent library, 23 ft. by 18 ft.; an assembly-room, 50 ft. by 30 ft.; with stage and retiring-room, two recreation-rooms, lavatory, and other necessary offices. The architect is Mr. E. W. Stephens, of Maidstone.

**Birmingham Architectural Association.** An ordinary meeting was held at the Association Rooms, Queen's College, on Tuesday last. Three gentlemen were nominated for membership, and two new ordinary members were elected. A lecture on "Electricity and Magnetism" was delivered by Mr. James Mason, and was illustrated by numerous experiments. At the conclusion a hearty vote of thanks was passed to the lecturer.

**Exhibitions at the Royal Albert Hall.**—The Council have decided to continue the Fine Art Exhibitions held in the galleries of the hall, and it is intended to make them annual. The exhibition for 1882 is now being organised, and will open in May next. The arrangements for the reception of "crowded-out" pictures from the Royal Academy will be the same as last year.

**A Club for Working Painters.**—A meeting of working painters will be held on Thursday, February 2nd, at Painters' Hall, by permission of the court, for the purpose of forming a club, and so dispensing with the necessity of holding their meetings at the public-house. Members of the livery are invited to meet the trade on the occasion.—*City Press*.

**Harbour Offices, Newport (Mon.).**—The new harbour offices which have been erected in Dock-street, for the Newport Harbour Commissioners, are immediately opposite the Custom House. On the east and west sides are two entrances, one leading to the Commissioners' rooms, the other to the Pilotage premises. The rooms for pilotage business are all on the ground-floor, and the Commissioners' rooms on the first floor. The pilots' reading-room has a lantern light to the roof. Rooms are provided on the ground-floor for the caretaker. On the east side are large doors and hall, leading, by a stone staircase, to the Commissioners' office, including a Board-room, 40 ft. by 20 ft. by 14 ft. The building is erected in the Italian style, and the front facing Dock-street is in stone from the Forest of Dean, and firebrick. The contract for the work was let to Mr. John Williams, builder, of Newport, who has carried out the same from plans prepared by Mr. E. A. Lansdowne, architect, and under that gentleman's direct supervision.

**Newton Heath, Manchester.**—On Thursday, January 12, a public inquiry was held by Major Hector Tulloch, R.E., one of the inspectors of the Local Government Board, at the town hall, Oldham-road, Newton Heath, on the application of the Newton Heath Local Board of Health, for sanction to borrow a sum of 13,000*l*. for works of public street improvement, and of 5,700*l*. for works of private street improvement, within their district. The improvements will be carried out by themselves with their own staff of workmen, under the direction of their engineer and surveyor, Mr. J. P. Wilkinson, C.E., by whom the plans, &c., have been prepared.

**New Associates of the Royal Academy.** At a General Assembly of the Royal Academy of Arts, held on Wednesday evening, Mr. Henry Woods, painter, and Mr. G. F. Bodley, architect, were elected Associates. We understand that there will be a special assembly of Royal Academicians on the 6th of February, to elect an Academician in the room of the late Mr. Street.

## TENDERS

For the erection of semi-detached residences, Holden-road, Torrington-park, N.W. Mr. Edward Power, architect.

Staines & Son	23,934 0 0
Pearce & Bayner	3,807 0 0
J. Whitaker	3,778 0 0
Conder	3,688 0 0
Johnson	3,663 0 0
Sabey & Son	3,475 0 0
Deat & Rice	3,387 0 0
French	3,180 0 0
Brooks	3,185 0 0
Ward	3,169 0 0
Evans	3,088 0 0
Parker	3,043 0 0
Cross	3,038 0 0
Ayres	3,002 0 0
Baines	2,969 0 0
Edridge & Gee	2,980 0 0
Grover	2,978 0 0
W. Wheeler	2,973 0 0
Gould & Brand	2,958 0 0
J. O. Richardson	2,894 0 0
Shurmut	2,870 0 0
Childs	2,760 0 0
Haygood	2,749 0 0
Young & Frazer	2,707 0 0
Perk	2,693 0 0
Ludston	2,648 0 0

For alterations, additions, and rebeneching Wesleyan chapel, Rye, Sussex. Mr. Butcher, architect.

F. Dapout, Colchester	2,305 0 0
C. H. Aldridge, Colchester	298 0 0
Marshall Ames, Rye	275 0 0
Frank London, Rye (accepted)	240 0 0

For alterations to the choir of St. Botolph's Church, Colchester. Mr. E. J. Dampier, architect.

Gardiner & Son, Colchester	2,690 0 0
Everett & Son, Colchester	850 0 0
Dobson, Colchester	615 0 0
Dupont, Colchester	475 0 0
Oldridge, Colchester	459 0 0

For the execution of certain works to add to the security of the foundations of Waterloo Bridge, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer.

Mowlem & Co.	271,357 0 0
Williams, Son, & Wallington	25,420 0 0
Nowell & Robson	27,438 0 0
Cook & Co.	26,510 0 0
W. Webster (accepted)	23,705 0 0

For stabling, sheds, &c., at Church-street, Stoke Newington, for the London General Omnibus Company, Mr. A. Toth, architect. Quantities by Mr. Bolton:

L. Goodall	21,918 0 0
B. T. Wood	1,648 0 0
C. P. Mills	1,743 0 0
Emor, Julian & Co.	1,737 0 0
J. Garrad	1,894 0 0
W. J. Beale	1,647 0 0
G. Parker	1,597 0 0
Birch & Moor	1,602 0 0
J. Crab	1,588 0 0
Richeira & Mount	1,560 0 0
Mark Gentry (accepted)	1,546 0 0

For proposed new vestry-hall for the united parishes of St. Margaret and St. John, Westminster. Messrs. Lee & Smith, architects. Quantities by Mr. Barnett:

Conder	23,800 0 0
Martin Wells & Co.	29,053 0 0
Miler & Brown	28,888 0 0
Vernon & Evans	28,000 0 0
Garrad	25,983 0 0
Jones & Co.	24,553 0 0
Merritt & Ashby	24,515 0 0
Reading	24,300 0 0
Crookett	24,244 0 0
Betterill	23,980 0 0
Wall	23,900 0 0
Julian & Co.	23,874 0 0
Manley	23,550 0 0
Adamson & Son	23,397 0 0
J. O. Richardson	21,600 0 0
W. & D. McGregor (accepted)	21,350 0 0

For the erection of a villa residence at Red Hill, Arnold, for Mr. James Acton. Mr. Herbert Walker, architect.

Quantities by the architect:—	
Enoch Hind, Nottingham	21,797 10 0
J. R. Morrison, Hyson Green	1,688 0 0
Dudson & Parrish, Basford	1,682 10 0
Henry Alsop, Mansfield	1,618 0 0
A. Wate, Arnold	1,491 0 0
J. F. Price, Nottingham	1,439 0 0
H. Scott, Nottingham	1,360 0 0
Smith & Greaves, Arnold	1,350 0 0
George Parsons, Mansfield	1,328 0 0
S. & J. Cargill, Basford	1,320 0 0
Charles Roundworth, Hucknall	1,302 0 0
Torkard	1,305 0 0
Baines & Turton, Basford (accepted)	1,235 0 0
T. McCulloch, Bulwell	1,208 10 0
Wm. Stainforth, Bulwell	897 0 0

For the erection of a house and sale shop at Basford, for Mr. Reuben Morley. Mr. Herbert Walker, architect.

Quantities by the architect:—	
Wheatley & Maule, Nottingham	2,021 0 0
Dudson & Parrish, Basford	507 0 0
Huntinton & Jeffery, Nottingham	845 0 0
E. Bocoet, Basford	896 2 0
J. F. Price, Nottingham	799 0 0
W. H. Taylor, Basford	787 10 0
Baines & Turton, Basford (accepted)	785 0 0

For alterations and additions to Ragnall House, Basford, for Lieut.-Col. Seely, M.P. Mr. Herbert Walker, architect.

Quantities by the architect:—	
G. Hopewell & Son (accepted)	2,603 0 0

**New Entrance Lodge.**

G. Hopewell & Son (accepted)	2,194 15 0
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For the engineer's work, hot-water apparatus, gas, &c., at the new Grammar-school, Bury St. Edmunds.

John Sutton, London	21,844 0 0
Sudder & Co., London	1,612 10 0
John Edmunds & Co., Fulham	1,445 0 0
Beckett Bros., Chelmsford	1,220 0 0
Humphrey & Co., London	1,209 10 0
W. J. Mason, London	1,100 0 0
George Grimwood & Son, Sudbury	1,050 0 0
G. Clutterbuck, Peckham	1,012 6 0
F. C. Andrews, Bury St. Edmunds	984 17 6
Chas. Lewis, Wilham, Essex	951 0 0
G. S. Cooper & Co., Bury St.	
Edmund's (accepted)	948 0 0
J. Knight, London	939 5 3
Land & Co., Stratford	898 0 0
Richard Crittall, Braintree	799 10 2
H. Gooding, Bowmarket	659 0 0

For new entrance in Piccadilly for the St. James's Hall Company. Messrs. W. Euden & Co., architects. Quantities by Messrs. Evans & Deacon:—

Hyman	215,801 0 0
A. G. Bolding	15,579 0 0
Nightingale	14,085 0 0
S. J. Scott	13,973 0 0
Chappell	13,831 0 0
H. Zax	13,860 0 0
O. W. Reading	13,858 0 0
Young, Cochrane, & Co.	13,370 0 0
Sharman	12,390 0 0

For infectious hospital, South Shields. Mr. Matthew Hall, Borough Surveyor, architect. Quantities by Mr. George Connell, Newcastle-on-Tyne:—

John Smith, Jarow	28,893 4 0
J. J. Simpson, Newcastle	6,677 11 6
R. Allison, Whitburn	6,534 9 7
Jos. Elliot, North Shields	6,489 15 0
F. Mackey, South Shields	6,434 12 11
D. Kennedy & Son, Jarow	6,393 10 11
James Storer, Jarow	6,054 0 0
Robert Atkins, South Shields	5,967 0 0

\* Accepted.

For roads and sewers on the Bowes Park Estate, Wood-green, for the National Liberal Land Company, Limited, Charing-cross. Mr. George Pooley, surveyor.

Humphrey & Son, Tottenham	21,500 0 0
John Bell, Wood-green	1,235 0 0
Wm. Nichols, Wood-green	1,115 0 0
Geo. G. Ratty, Bromley-by-Bow	1,085 0 0
James Bloomfield, Tottenham	1,068 0 0

\* Accepted.

For completing the restoration of Llanrhaidir yn Mechain church, near Oswestry. Mr. W. H. Spaul, architect. Quantities supplied:—

Morris, Chaplin, & Curney, Oswestry	21,478 0 0
W. Birrell, Shrewsbury	1,368 0 0
Ridge, Penygarndd	1,259 0 0
Hughes, Llanrhaidir	1,208 0 0
Samuel, Wrexham	1,200 0 0
W. & G. Thomas, Oswestry (accepted)	1,170 0 0

For front block of new church institute, Maidstone. Mr. E. W. Stephens, architect:—

Callard & Son, Rochester	23,730 0 0
Pryer & Co., Maidstone	7,729 0 0
E. Vaughan, Maidstone	7,700 0 0
Simmonds, Maidstone	2,680 0 0
Cox Bros., Maidstone	2,580 0 0
Naylor & Son, Rochester	2,610 0 0
Arard, Maidstone	2,653 0 0
Wallis, Maidstone (accepted)	2,634 0 0



**NOTICE.**—The **POLYGONAL REFLECTOR** (Latest Patent) **FOR ARTISTIC and PICTURE GALLERIES.**  
Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.



# The Builder.

Vol. XLII. No. 2034

SATURDAY, JANUARY 28, 1893.

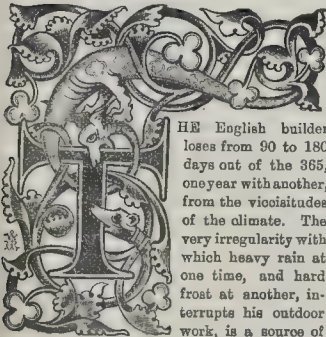
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### An Important Economy to be effected by the Builder.



THE English builder loses from 90 to 180 days out of the 365, one year with another, from the vicissitudes of the climate. The very irregularity with which heavy rain at one time, and hard frost at another, interrupts his outdoor work, is a source of cost and loss. If the

seasons arrived with anything like the exactitude on which it is possible to count in some parts of the world, it would be possible to arrange a programme of the work of the year in such a manner as to suit the seasons. As it is, this is impossible. But the question is worthy of attentive study, how far it is practicable so to arrange the execution of important works as to prevent on the one hand cruel waste of time, and on the other hand permanent disfigurement, or even more serious damage, to structures left exposed while unfinished to the capricious fury of the elements.

A stranger to England who should be taken to see the progress of some important national or private work would naturally come to the conclusion that rain was either an unknown phenomenon in the country, or that it descended at such regular and well-known intervals as to allow of the arrangement of out-of-door work in such a manner as to avoid exposure during the rainy season. How far this is from being the case we are too well aware. The morning journals give us some shrewd guess as to the dry or wet character of the day on which they appear. A little study of the weather maps which some of them print, and of the warnings sent from that mother of depressions, America, allows the guess to be prolonged for three or four days, with some plausibility. And this is all. How many wet days will there be in a year, and how these days will be distributed, is a matter as to which no sensible man can form any reliable opinion beforehand. We may have, and sometimes do have, a month or two without rain. We can remember seasons in which, in some parts of England, it seemed to rain for nine months continuously.

It is, when we come to think of it, a very remarkable thing that the architect has not gravely contemplated this state of things, and set himself to meet the difficulty. We cannot, of course, pretend to speak exhaustively, or to say that what we are about to suggest may not

have been considered and acted upon before now, with comfort and advantage. But if such be the case, it is only the more remarkable that there has not been some general and authoritative utterance upon the subject. A tolerably long and familiar acquaintance with public works has led us to regard the interruption of out-door work by wet weather as occurring, not indeed, with the predicated regularity of an eclipse, but with as little idea of human prevention as if the meteoric changes of our climate were distant astronomical phenomena. Is this all that science and civilisation can effect in this matter for the builder?

A week or two ago the writer of these lines was in the city of Oxford. In the new schools, a noble building, now almost complete in the exterior, was to be observed a precaution, which is, to say the least of it, unusual. It, no doubt, was attended with appreciable expense, but it is an expense which was very wisely incurred. The long corridors, lofty halls, and stately staircases of this magnificent quadrangle are all warmed, by coils of plates, heated, we apprehend, by hot water, and radiating a very sensible and comfortable heat. The effect of this upon the conduct of the interior work is of the greatest advantage. Seasoned timber is not allowed to lose in a few weeks of neglect the quality which it has taken years to gain. Floors, and wainscots, and fittings are not exposed to damp that will cause them to warp. The cold, clammy damp which usually hangs within large unfinished buildings in the winter season, was altogether absent. The health and comfort of the workmen, no doubt, are thus materially cared for, and the excellence and durability of the work,—and in this case the architect is building not for a building lease, but for centuries,—are, we cannot doubt, increased in a ratio very much higher than that represented by the cost of fuel. As soon as the building is roofed in; it is thus rendered, not only habitable, but in a sense inhabited, and we have little doubt that the health of the inmates will hereafter be the better for the coats that were thus burnt while the house was in building.

At another point in the same ancient and famous city rose a row of scaffold-poles, like the masts of vessels in the Pool, supporting platforms and ladders, and a busy throng of workmen. The sharp clink of the trowel was audible; the masons, and bricklayers, and labourers swarmed like bees at the door of a hive. All was industry; and the building grew slowly beneath the eye. Night fell on the busy scene. With morning light came no sounds of awaking, except the cry of a dolorous cock, echoed by the jubilant quacking of a brood of ducks, brought up by hand, unprovided with their proper playground of a pond, and clamorously thankful for the supply of water which Nature sent them. Not a man was at work. It was not Sunday; there was no strike. The straight-backed workmen that lounged dolorously along the streets had on their faces the expression of misfortune—not

that of resentment. It seemed as natural to them to lose their day's work because it rained as it did to the poor water-famine-stricken ducks to rejoice at the same event. Were not the labourers as ill-used as the ducks? Would it not have been far more easy to provide them and their work with a temporary cover than it would have been to dig a duck-pond in the garden?

There was the row of scaffold-poles; there the empty scaffolds; there the unfinished, interrupted work, steadily soaking in all that the sky sent it, to the permanent detriment of the structure. It may be the case that the ancient school of learning might have held that the particular structure in question would not be likely to be required for its present destination for so long a term of years as to make it necessary, *condere in eternum*, to build for ever, but that is neither here nor there.

Why, was the thought that occurred to the mind, should not those two end scaffold-poles have been made rather longer and stronger than the intermediate row? Why should not a boom, yard, or ridge pole have been slung between them, fitted with ropes and pulleys, so as to have been lifted, each day, in proportion to the rise of the wall? And why should not a sheet of tarpaulin, or of prepared canvas, like the roof of a marquee, have been thrown over that boom and pegged down by gyes or shrouds? Half an hour's work by two or three men would have been enough to rig up the canvas roofing in the morning; and beneath its shelter who would have cared whether it rained or shined?

There may be cases where work is so scattered and so slight as to render such a provision as is above suggested too cumbersome to be altogether desirable. Such, probably, will be the case with the work of the jerry builder. But the instance above cited, which is by no means an imaginary one, may be taken as typical of a large amount of the best kind of building. Where an edifice is of sufficient size to employ ten or twelve workmen on one face, or one compact portion, we can see no reason why the protection of both men and building from steady downpour should not be made as integral a part of the arrangements as the erecting of the scaffolding itself. What is the objection? What the *per contra*? Let us regard it first from the workman's standpoint. To him such an aid would simply mean assurance against bad weather. Is it easy to compute the value of this assurance to the workman? Let us take a skilled mason or bricklayer who earns, for the sake of argument, let us say five shillings a day. One year with another it might save him 25*l.* per annum to be rendered independent of the arrest of his work by rain. Twenty-five pounds of pure gain in his pocket! For he must eat on these wet days. His rent, the cost of his clothing, of his fuel, all the contingent expenses of the year, go on alike be it wet or dry,—or rather are somewhat more when it is wet. More fire is needed to warm the damp air, to dry the wet clothes,—to warm the body



that is not kept warm by profitable labour. And the beer-house presents a stronger temptation on a wet day than on one of brisk employment. All round we cannot reckon that the workmen employed in the building trades would save less than from 25 to 30 per cent. of their time,—that is to say, would increase their net annual earnings by no less than from 25 to 30 per cent. by being rendered independent of the weather.

To the master-builder the gain would not be as large as to the workman, but it would still be considerable. If his accounts were so kept as to enable him to distinguish the cost of out-door and in-door work, he would soon be able to form an estimate of the increased profits that he would ensure by taking steps to set the weather in some degree at defiance. On all his capital invested in appliances for the execution of the former he would save from 25 to 33 per cent. of the annual interest and depreciation. On his office expenses, as far as they could be apportioned to this part of his trade, he would save from a third to a fourth, as staff and outlay that could keep all things in order in fine weather, can be only partially occupied when work is stopped. Nor is the certitude with which he would be able to calculate on the rate of progress that he could command, in itself, other than an element of profit. Again, in the distribution of both work and workmen, a great advantage would be effected. It is by no means over-stating the case to estimate that the master-builder would effect a saving of from one to two per cent. per annum on the capital employed in his business by taking wise and efficient steps for the protection of work in progress from weather.

The saving of vexation and anxiety to the architect would be no less palpable. Punctuality in the completion of work would thus be commanded, and the need of putting on a large number of strange workmen at a pinch would be avoided. The excellence of the work would be appreciably greater if it were carried on without interruption, and if that soaking of the water, from which some materials never wholly recover, could be altogether prevented. And if with this protection of the work before roofing-in, be combined that care in keeping dry and warm the interior of the building, from the time when the roof was complete, to which we have before referred, the gain to the excellence, durability, and habitability of the building would be great. And in this part of the case directly, as in the whole of it indirectly, the interest of the owner and future occupier is at one with that of the working-man, the master-builder, and the architect.

#### THE EARLIEST VIEW OF LONDON.

THE Society which has been formed under the title of the "Topographical Society of London," the object of which is to illustrate the history and topography of the capital, has just issued to its subscribers the first instalment of its publications in furtherance of this object, in the shape of the first half of a *fac-simile* of the oldest known view of London. The whole drawing will be complete in seven sheets, of which three, commencing from the eastern extremity of the view, are now issued, and the remainder are promised quickly.

The drawing thus brought out from its place of hiding in the Bodleian Library, and placed, by the aid of our modern processes of reproduction in *fac-simile*, within the reach of whoever may be interested in it, was made by an artist named Antonius van der Wyngaerde, somewhere very near the middle of the sixteenth century. It has been conjectured that he was a Fleming, attached to the court of Philip II., a conclusion which seems to be supported at least by the fact that his drawings out of England are at Rome, in Spain, and in the Netherlands. This, however, must, after all, be conjecture. The present drawing is not signed with any name, but those concerned for it are ready to vouch that it is obviously by the same hand which executed other drawings to which the name of Wyngaerde is attached. The original was bequeathed to the Bodleian by Mrs. Suberland, and two copies of it by hand have been made, one for Mr. Crace, now in the British Museum, and one for the Corporation of London, which is in the Guildhall Library; but the present is the first real publication of the view. It has been reproduced by the Typographic Etching Company.

Mr. Wheatley, the secretary to the Topographical Society, is anxious to vindicate his Society's publication as the genuine "earliest view" of London, and disposes of four views of various kinds in the Crace collection, of earlier date, as being not in reality "views of London." We remember two at least of them, and concur in thinking that 'y cannot be called views of London: one gives a grotesque view of the Tower; another, an illuminated MS., gives what is probably on the whole a very fairly realistic view of Old London Bridge; realistic, that is to say, for a MS. of that kind. But these are obviously not views of London, and we may probably accept it that the one, the copy of which is before us, is the earliest delineation of London, in a general view, that has come down to us.

The three sheets now published extend from "Billens Gate" eastwards to Greenwich, the view being taken from somewhere in Southwark,—it is said, from Old Suffolk House, Southwark,—"now" (1826) "the Mint." The perspective is, however, considerably exaggerated in regard to height of sight-line. The Thames cuts the view nearly in half longitudinally, the major part being on the lower or southern side of the Thames. This portion, constituting what one may call the foreground, is put in very sketchily, but with obvious attention to the real features of the scene. Opposite Billingsgate the site is tolerably crowded with houses towards the river, leaving, however, open fields and large trees in the immediate foreground; farther east, opposite the Tower, the houses become only one row of dwellings of irregular heights, mostly two-storied, adjoining the bank of the river; the remainder is open field with occasional trees; a farmhouse and outbuildings and a cart with three horses *tandem*, preceded by a man flourishing a long whip, are introduced in the immediate foreground; the farmhouse shows plainly a peculiar and well-known form of half-timber work with the struts out into a serpentine shape. Beyond this, on the extreme right of the drawing, is seen the Thames winding through open country, and the picturesque, turreted buildings of old "Placentia," on the site of modern Greenwich Hospital, which are more carefully sketched than most of the buildings on the view. The perspective of the landscape here, however, is puzzling. Apparently from a determination to get the winding of the river complete into the view, the reaches southward, towards the spectator, are curtailed, and that northward, towards Blackwall, greatly extended, so that Blackwall, or a village in the distance which occupies that position on the bank, must be further away north than Bethnal-green. This latter place is, we imagine, represented by a distant village which stands higher on the paper (owing to elevation of the land) than our supposed Blackwall, though not so distant judging by the scale of the buildings. It shows a spire rising from the midst of a few houses.

Coming westward to the real object of the view, we find the Tower tolerably carefully, and on the whole, correctly sketched, comparing the sketch with the portions which still remain. The way down to the river, between the Tower and the east end of Lower Thames-street, evidently was in existence then, and faces us, running down, flanked by the western wall of the Tower precincts. On the Tower wharf are very plainly shown certain large cranes, presumably for hoisting stores and arms out of ships; and cannon are also dotted about, not in any regular order, but here and there, pointing in different directions. Behind the Tower is the open space so tragically notorious as "Tower Hill," or rather, behind the lower buildings of the Tower; the keep stands clear of it in the view. In the centre of the space is sketched what is evidently a permanent scaffold, with steps up to it, witness of a time when executions were of too common occurrence to allow of a scaffold being specially built up for each occasion. The eastward boundary of this space of Tower Hill is the old wall, which is seen stretching up the ground, following about the present line of the Minorities, or rather, a little westerly of that street; a gate opens through the wall from Tower Hill to the exterior, with a small tower rising above it, and adjoining it, on the City side, a small enclosure planted with shrubs, apparently the garden of a gabled house which rises from the midst of the foliage. The position of this gate must be not far from the present site of Trinity House, but rather west of it. Outside the gate there seems to be a very

sketchy and slight indication of a meat and bridge. Outside the wall, immediately eastward of Tower Hill, is the larger open space of ground which was then known as East Smithfield, the name still preserved in the street south of the Mint, skirting the St. Katharine's Dock; the lower portion of this space is now occupied by the Mint, and the upper end is known under the name of Goodman's Fields. On the east side of this space, somewhere about the west end of Royal Mint-street, is seen a cross, roughly sketched, surmounting some steps; and further up the space a triangular erection on the top of a post, which is probably a cage for the confinement of malefactors of a minor shade of guilt, as one is known historically to have existed here; an indication of a similar erection on Tower Hill is faintly traced. Eastward of this open space,—East Smithfield,—stretched a considerable belt of extra-mural houses, commencing about Aldgate and extending south-easterly down to the water, with several churches or chapels rising from among the houses. Here we find one of those instances, so often seen in the annals of cities, of a sort of continuity of history of sites, even under the greatest changes; for here, at the bankside, just about where "Steam Packet Wharf," adjoining St. Katharine's Dock, is marked on the modern map, is a wharf and something like a half-dock, from which the stems of one or two vessels protrude.

Going back to the city wall, we trace it easily up to Aldgate, where the square mass of the gate is conspicuous, crowned by several poles, nodding over in different directions, with little knobs on the top of each, which a nearer view would undoubtedly show to be human heads. A large cross church, which, by the shape of the angle-turrets of the tower and transepts, can be made out to be Late Gothic,—decidedly late,—stands just westward of the gate, the former parish church of Aldgate, not on the site of the present one, which is just outside the old line of wall. Just outside the gate is a church-tower, looking of older date, with a very conspicuous cross on each angle of the tower, which appears to be almost on the very site of the present parish church of Aldgate. To the right of this, the road, now Whitechapel High-street, is traceable for a little way, between rows of houses. Westward it is difficult to identify a good deal of the view. The wall is traceable throughout, following the lines of Houndsditch and London-wall; and the Bishop's Gate, and the lines of "Bishopsgate-street Within" and "Bishopsgate-street Without." The latter projects right out into open ground, between two rows of houses, terminating in a large church, the existence of which seems the *raison d'être* of the street. Over this church is written, "S. Maria Spital," this having been the hospital and priory of that name, which was disestablished at the Reformation, and when this view was taken must have been in little better condition than waiting till some one took the trouble to pull it down. That some special interest was attached to it just then seems probable from its being one of the few features in the view to which a name in writing is appended. The Priory, with its appurtenances, forms along the line of Bishopsgate-street Without the form of a T, of which the street is the stem, projecting out into the fields from the general mass of the city. To the left, in the shoulder of this T, is the space now occupied by the Broad-street and Liverpool-street Railway Stations, and the names of "Worship-street" and "Holywell-street," immediately to the north of this space, and close on the old site of the Priory, still tell of the former sanctity of the neighborhood, now given over to the whistling of locomotives.

The lines of Fenchurch-street and Leadenhall-street can be traced in the view, but the former does not seem to be quite at the correct angle, nor is it easy to identify some of the churches, or their sites (where they have been rebuilt since the date of the view). The houses are mostly just roughed in, in such a way as to show which way their gables faced, and the numerous rather steep pointed gables give to the general view a very different appearance from that which a bird's-eye view of the same part of London at present would have, without taking into account the enormously increased size and height of the buildings for commercial purposes at the present day. The front facing the north bank of the river, however, is drawn, though roughly, with an apparent intention of showing all the main and characteristic features of the buildings, which makes this portion of the drawing very interesting. We see old Billingsgate



Market, with three large open arches and steps down from the quay, and two ships waiting to deliver or discharge cargo in a kind of inlet or basin just large enough to hold them, between the market quay and another long building with its gable end to the water. The odd rounded shape and high ends of the boats and ships are no doubt from reality, but we may probably take it that even at this period the Thames showed far busier life in the way of shipping than is indicated by the few craft dotted about in this view, and that as Wynegaarde's real object was to draw London, he omitted most of the ships and boats as troublesome items interfering with the view, and not necessary to it. This we take to be the explanation; for London business and the London market must have been "quiet" indeed in those days, if "Thamesis Fluvius," as the old maps delight to call the river, had been really as bare of craft as he is represented in this drawing.

But the picturesque variety of the river frontage is obvious from the drawing, and rough as is the draughtsmanship, we gather a good deal from it. We can trace some of the various methods of construction which the artist has, in his hasty manner, carefully indicated. We see the house with a large end archway towards the quay, and the outbuildings with lean-to roofs, and the house half covered with black and white timber work in cross diagonal bracing, and the other one with a line of similar work in rectangular "post-and-pa" running across the elevation between the upper and lower story; and another with two arches and a column between them, another with a large arch below and the windows above ranged in a regularly spaced row under the eaves: these details are indicated sufficiently for us to fill them up with our mind's eye, and to see that there was plenty of work for the sketchers who might in those days have been on the look out for the picturesque of street or wharf architecture.

London Bridge is just missed in the sheets now published; it is very carefully shown in the original, and much else of interest may be looked for when the remaining four sheets which complete the view are published. Meanwhile we may make one suggestion as to the method of producing or mounting the separate sections. They are each mounted with a tolerably wide margin all round, so that it is impossible to put them together so as to make the whole continuous to the eye. This seems a mistake. The sheets should have been mounted with a margin at top and bottom only, or, at all events, with only a margin on one side of each, so that by means of overlapping we could get over the awkward intervening strip of white, and be able to see the drawing as a continuous one. It would be much more easy, in that case, to study it in connexion with the map of existing London.

#### RICHARD COSWAY AND THE CARTOONS OF GIULIO ROMANO.

THERE exists in France an excellent and not perhaps sufficiently well-known society, whose professed aim, as its title, "La Société de l'Histoire de l'Art français," might imply, is the special study of all points that may be connected with the history of French art. The field of its labours, though thus apparently limited, is agreeably extensive, and many are the discoveries, the inquiries, the corrections, and the facts which the members of the society are able to throw on the subject which forms the common bond of interest and research. The publication from time to time of the so-called "Archives" of the society places within the reach of what may be termed the outsiders, some if not all of the pleasant privileges of membership, and at least enable them to profit by the funds of information gathered by the various members of the society. A recently-published volume of these "Archives," a brimful of scattered notices of little known and more famous artists, quaint artistic scraps gathered from the long-hidden and dusty sources of royal accounts, inventories, and such-like documentary sources hidden from the general gaze of the profane, and commending itself but in a small degree to the English reader, contains a curious account worthy attention of the presentation to Louis XVI. by Cosway, the painter, of the series of cartoons by Giulio Romano, which it will be remembered by all visitors to the Louvre, form a conspicuous feature in the galleries devoted to

the drawings of the old masters. Allan Cunningham, in his "Lives of British Painters," has, it is true, told the tale of the incident, but the latest contribution to the details, consisting in the publication of the correspondence exchanged on the occasion, is interesting, and to not a little extent instructive.

Cunningham relates how one day Cosway, having on a visit to the Louvre, then a half-deserted palace, remarked to his wife,—the beautiful Maria Cosway, who was to inspire so profound an admiration in the poet André Chénier,—on the bareness of the walls, he thought him of the Giulio Romano cartoons in his possession. He offered them to the King of France, who accepted them, presenting to the painter not long after four superb pieces of Gobelins tapestry, scenes from Don Quixote by Coypel, together, so we learn, with a complete copy of the "Estampes du Cabinet du Roy." Such are the related facts as to how Cosway's cartoons came into possession of the French Government. The contributor of the correspondence on the subject of Cosway's cartoons, M. Guiffrey, takes upon himself to doubt the entire accuracy of the statement; from another letter contributed by him to the Society's archives, he points to the fact of a previous offer of the cartoons to the French Government, when they were refused; from this and other circumstances, M. Guiffrey would wish to imply that Cosway, finally being unable to sell his troublesome possessions, had determined to present them to the French king, going to Paris to follow the negotiations. It is pleasant to find that this unflattering view of the charming painter's generosity can be proved to be incorrect. M. Guiffrey is certainly able to clear up one doubtful point left by the able *conservateur* of the pictures in the Louvre in his account of the cartoons. It would be interesting to know, asks M. Reiset, how these works came into the possession of Cosway. Preserved until 1631 in the ducal palace at Mantua, for which they were prepared, they were carried at that date by the Imperials to Venice; there they remained till the end of the last century, where they were purchased by an English gentleman, who, however, on his return home, finding the cartoons too large for his gallery, parted with them to Cosway.

The first letter of the published correspondence is one from M. d'Hancarville to the Comte d'Angivilliers, stating to him that Cosway, after seeing the magnificent Sèvres vases and other objects for the embellishment of the Museum, which was then being formed, and struck by the grandeur of the idea and the good that would come of it, "asks you to present to the king four cartoons worthy to be offered to him, as uniting the powers of Raffaele and Giulio Romano." These are the cartoons which now hang in the Louvre, after having passed through an odyssey of adventures well told in the Louvre catalogue (Dessins, &c.). The passage in the letter which follows is, we think, particularly noticeable, as bearing on the question of the impugned generosity of Cosway:—"No sum would be capable of obtaining these works from his hands, for he enjoys a considerable fortune; he is a great connoisseur, and so far from desiring to get rid of any object, he daily augments his collection by pictures and drawings. He tells me that if the Prince of Wales, to whom he is attached, or the King of England, possessed a collection like that of the King of France, and made so good a use of it for the public advantage, he would believe himself obliged to make the same offer to him as to his majesty. Nothing is more disinterested than his offer, for he would refuse any recompense or advantage. His ambition is to contribute to the good of the arts. He himself is a very distinguished artist, a member of the Royal Academy of London, and first painter to the Prince of Wales. The step of M. Cosway [sic] is a homage," continues the writer, "which strangers render to the king, whose broad views for the advancement of art are applauded by the whole of Europe. It is to be the benefactor of the world to encourage the arts, as they contribute to unite all nations which political interest renders unfriendly. Such interest sometimes produces heroes; but a taste for the arts, by softening the manners, makes men, and men are certainly worth heroes. Continue to encourage these institutions, so useful to the public welfare; they augment the glory of the king, the reputation of France, and that of our century, which has great need of such means to be the equal of that which preceded it."

The second letter is a copy of that sent by the Comte d'Angivilliers to Cosway, "first painter of his Royal Highness the Prince of Wales," and dated September 5, 1786. After acknowledging the receipt of Cosway's letter, the writer breaks into praise of the donor's generosity,—"It would be impossible to give a more noble proof of his love for the arts than a sacrifice of this nature." The letter the Count gave to the king, who, he assures Cosway, asked him (the Count) to express to him (Cosway) his utmost gratitude. "It would be desirable," continues the Count,—and the view he takes is one interesting to see expressed a century ago, but the truth of which still remains too little understood,—"it would be desirable that all those who possess beautiful objects should make as noble a use of them by enriching great national collections. It is procuring their enjoyment for all nations, it is establishing a bond between them." After a polite acknowledgement of thanks for the pleasure it gives him to negotiate the affair, and a hope that the time may approach when "all such possessions may become a common enjoyment for all those who love and cultivate the divine arts," the letter closes with a compliment to "Madame de Cosway's [sic] talents."

These are the two letters contributed to the "Société de l'Histoire de l'Art français" by M. Guiffrey, whose views of the doubtful generosity of Cosway in presenting the cartoons is, however, we are happy to see, warmly disputed by so able an authority as the *conservateur* of the Louvre picture-gallery, M. Reiset, in a lengthy note inserted at the end of the volume of the "Archives" from which we have gathered the facts of this paper. In the first place, M. Reiset very properly doubts that the reference in the first instance to cartoons by Giulio Romano having been offered to, and refused by, the French king, relates to those eventually presented by Cosway; the curator of the Louvre opines that these other cartoons are a series, very far inferior to Cosway's, which, as he tells us, have for eighty years past been periodically offered to the Louvre every five or ten years.\* To M. Reiset the story told by Allan Cunningham appears in every degree trustworthy; how otherwise, if Cosway had been merely desirous to rid himself of troublesome property, would the Comte d'Angivilliers have spoken in terms of such gratitude in his letter to Cosway on the subject of the present, which, as M. Reiset truly says, was "superb"?

It only remains for us now, when we have lost the prize, to regret that there did not exist in Cosway's time a National Gallery where such works as these, which the painter judged as unworthy to possess, would have well taken their place with those other treasured relics of the great epoch of Italian art, the Raffaele Cartoons at South Kensington and the Mantegna *tempera* pictures at Hampton Court, which it is to be hoped will, some day, at no distant future, be brought together.

#### THE COMFORT OF THE RAILWAY PASSENGER AND THE INTEREST OF THE RAILWAY SHAREHOLDER.

A CORRESPONDENT of a morning paper has called attention to the extraordinary difference in the character of the service rendered to London by the nine great trunk railways which radiate from the metropolis, both in charge and in speed. The latter varies by 33 per cent., from 36 miles per hour on the Great Eastern, to 43 miles per hour on the Great Northern. The rate of fares varies by 48 per cent., from 1'666d. per mile on the Midland, to 3'076d. per mile on the London, Chatham, and Dover. But there is no relation between higher fares and higher speed. On the contrary, the swiftest line, and the one, we may add, which has the severest gradients (with the exception of the Brentwood incline), is also the cheapest. The speed on the Great Eastern, the Brighton, and the South-Western lines is from 36 to 40 miles per hour; that on the South-Eastern, the London and North-Western, the Midland, the London, Chatham, and Dover, and the Great Western, from 42½ to 45½ miles per hour; and that on the Great Northern, as before stated, 48 miles per hour. We may add that of the three Northern lines, each locomotive on the Great Northern earned

\* See a notice of these works, Louvre Catalogue, Dessins, &c.; Écoles d'Italie, &c. pp. 239, et seq.



4,900l. per annum; on the Midland, 4,662l.; and on the London and North-Western, 4,146l. These rates of earning are not in the exact ratios of the speeds, but they are very close upon them. It must be remembered that the data with which we have to deal are extremely restricted. The inquiry is as to passenger traffic alone, and the whole system of accounts of all the English railway companies, as far as presented to the Board of Trade, is scrupulously contrived so as to prevent any useful information being obtained as to separate branches of traffic. Again, the writer whose figures we cite has given the speeds in such a manner as to be most instructive to the passenger; that is to say, the actual time consumed between different points. But speed, as a matter of cost, depends, as far as consumption of fuel is concerned, on maximum running velocity, which is quite another thing. For example, on the Metropolitan line, the stations are so numerous that the net speed from terminus to terminus is less than a third of the running speed. In this case, then, both cost of fuel and cost of wages are at the maximum, or nearly so, and the total cost is increased by thus burning the candle at both ends. Probably the low average speed of the London, Chatham, and Dover line, cited by our informant as 42·617 miles per hour, is due to the large number of stations. On the other hand, the Great Northern quick trains run 76 miles from King's-cross to Peterborough without a check, and thus speed is an element of cheapness.

There is, however, a reason for the difference of fare which has escaped the writer in the *Times*. The lowest fares are those on the Midland, the Great Northern, and the London and North-Western lines, which are respectively cited at 1·606d., 1·756d., and 1·835d. per passenger per mile. But this is a case of keen rivalry, and the mileage rates are evidently arrived at by fixing equal charges for conveyance to the same places by the different lines, the difference in the lengths giving a slight difference in the cost per mile. On the other hand, the London, Chatham, and Dover, and the South-Eastern, have not allowed their rivalry so far to make them lose sight of the main chance as to come down from the maximum legal fare. By the first, 3·076d. per mile is charged for 78 miles; by the second, 3·157d. per mile for 76 miles. The speeds are 43·511 and 42·617 miles per hour respectively. Their given passenger earnings per train mile are 6s. 6½d. and 7s. 1½d. respectively; their earnings per engine, 6,790l. and 6,369l. per annum. Of the London, Chatham, and Dover traffic, 67 per cent., and 70 per cent. of that of the South-Eastern, is derived from passengers. The working expenses per train mile are 39·3d. and 41·9d. respectively. But the net receipts (according to the Index to the Railway System) are only 2s. 7½d. per train mile on the first, against 3s. 10½d. per train mile on the second. It is possible that by calling attention to these somewhat anomalous figures we shall elicit information from some one familiar with the working of the two lines in question which may elucidate the subject. What we have now to urge is, first, that reduction in fares is at present to be looked for from competition alone, as it seems to us; and, further, that such competitive reduction, however grateful to the public, is matter of very short-sighted policy on the part of the railway managers. The receipts per passenger train on the three northern lines could be raised from 4s. 6d. to 6s. 3d. per mile but for the permanent reduction due to the policy of the Midland.

The French Government, it is said, are now calling on the railway companies to reduce their fares by 50 per cent., and their freights by 20 per cent. The mean of French fares and freights is given by M. de Franqueville as 1·06d. per passenger and 95d. per ton per mile, against 1·293d. per passenger, and 1·08d. per ton per mile in England. As our working expenses are some 54 per cent., and as the balance of 46 per cent. of revenue only pays 44 per cent. on capital, it is obvious that any such proposal in England would mean something like extinction of dividend. But is it not a subject for serious consideration to inquire why the French railways have been so managed as to become a property so superior to our own in value, that the question of such a reduction, as an alternative to being bought by the Government, on the terms provided for in the original concessions, should be for a moment thought worthy of discussion? Since the above was written it is stated that one of the great French lines has agreed to make the abatement in question.

#### A CONTEMPORARY SKETCH OF ISAMBARD BRUNEL.\*

It is now nearly a century and a half since the rising commerce and manufactures of this country, accompanied by and dependent upon the rapid opening up of its mineral field, called into existence the profession of the civil engineer, and during that period, as from time to time the circumstances of the country have demanded works of magnitude and skill, men fully equal to the occasion have risen up for their construction. France, during the reign of Louis XIV., was far before England in her roads, canals, ports, bridges, and quays, but that pre-eminence was rudely threatened when Smeaton, the founder of the English profession, constructed the lighthouse on the Eddystone, and was completely destroyed as early in rapid succession Brindley, whose name is associated with our earliest and greatest canals; Telford, who brought to perfection our turnpike roads, and who spanned the Severn and the Dee and the Menai Straits with those marvellous bridges, the two former the largest arches then constructed in England, and the latter a bold assertion of the new principle of suspension; Rennie, the great dock engineer of his day, and the constructor of Waterloo and designer of London bridges; George Stephenson, the father of the railway system and the engineer to a work long pronounced impracticable, the Liverpool and Manchester railway; Robert, his gifted son; Brunel, the inventor of the block machinery and the engineer to the Thames Tunnel; and, finally, Isambard Brunel, whose name closes this brilliant roll, and whose life, recorded by the piety of his son, is now (1870) given to the world.

Of the great men enumerated above, each was distinguished by the attribute of original genius. There have been and are others, engineers of great merit, who have executed very considerable works; but no engineer can be counted in the highest rank of his profession who does not largely possess that inventive faculty without which a claim to genius can hardly be substantiated. Nearly all these men, Smeaton, Brindley, Telford, Rennie, and Geo. Stephenson, were self-taught; the four latter rose from the ranks, and won their way to knowledge and to eminence by slow and severe labour. Robert Stephenson and Isambard Brunel were perhaps still more severely tried, for they were, especially the latter, by the accident of birth, placed early in life almost in the position attained by their parents towards its close—a position highly favourable to the establishment of a respectable mediocrity, but much less likely to elicit those qualities and that industry without which the highest places are not to be attained.

A man who has not executed great works can scarcely be a great engineer; but the reverse of the proposition is by no means so generally true. The founders of the profession had to employ materials, sometimes novel, but always to resist strains and pressures of a nature to which they had not before been subjected, and their originality was shown in the way they met and overcame these difficulties. By reason of the experience of the past, the present race of engineers are but seldom called upon to exercise such qualities. After Telford's bridge the application of the suspension principle was a mere matter of calculation. After the tubular bridges of Conway and the Menai, and those of mixed construction over the Wye and the Tamar, any contractor could erect tubular bridges to order, and in criticising the great works by which the metropolitan railways are conveyed across the Thames, our praise or blame is confused, or nearly so, to their architectural or ornamental merits, while their engineering qualities, their power to resist strain, is taken for granted as settled by ordinary calculation; nobody asks by whom they were designed.

Isambard Brunel inherited from his father a great fertility of invention, remarkable quickness and accuracy in calculations of all sorts,—what he himself called "a mechanical mind,"—powers of steady persistence, and an excellent temper. To these he added a far greater measure of worldly prudence, more knowledge of men, and a turn of thought more strictly practical than that of his father.

There are now but few remaining who knew the elder Brunel at all intimately, nor does Mr.

\* The following fragment, written long ago, was laid aside for some temporary reason, and never completed. It was accidentally met with a few weeks since, and we quite agree with the writer of it in thinking that many of our readers will find pleasure in the perusal of it.

Beaumont's account of him unfold, to any great extent, his peculiarities of character. Of the world with which he had so much to do he remained to the last exceedingly ignorant. His simplicity, out of his profession, was childlike. A true Frenchman in his sunny temperament and his enjoyment of conversation, the garrulity of old age led him to delight in stories of his own very remarkable career. He liked to tell how, when a boy in the French navy, he constructed his own quadrant; how, when he reached New York, he built a theatre, now burnt down, and laid out a line of canal with a level, an instrument he saw on the field for the first time; how, when he landed in London, he sauntered under the archway of Somerset House, little thinking that some day he was to sit as vice-president in the great scientific society whose rooms were above it; how he devised a machine to enable Lady Spencer to deal cards at whist, and another for the same lady for winding her cotton into balls. Very curious was his account of the difficulties both with men and matter that he had to overcome before he, a foreigner, succeeded in establishing his machinery in an English dockyard; how he made boots and shoes by machinery with most wonderful nail patterns upon the soles, at Battersea; and how the upholstery trade, with its narrow trade-union spirit, was too much for him, and would have none of his machine-made cabinet work, of which a charming specimen was the writing-table at which his son always sat. It was these little confidences that secured him the love and sympathy with the young and those about him, and which produced a character that, had his son been spared to relate it, would have been indeed a charming piece of biography.

The points of difference between the father and son were at least as distinctly marked as those of their resemblance: Isambard Brunel, with a frank, open manner, the very reverse of mysterious, was habitually reticent, and could keep a secret so well that no one would have discovered that he had a secret to keep. In his vocation as an engineer, Isambard Brunel confined himself to the matter in hand, while his father indulged in all sorts of curious illustrations. Both father and son would have calculated the pressure to be borne by the Tunnel Shield, its area and power of resistance, but the old man alone had discovered that its cross area was that of the then House of Commons, that so many men could march through it in a given time, that its length was such a fraction of the diameter of the earth, and so on.

His journals and books of calculation, written in his clear minute hand, with the nest of sketches illustrating what needed illustration, were, and doubtless still are, a collection of numerous and very curious observations.

The author of the biography has well attributed the real professional education of his father to the school of the Thames Tunnel. For a young engineer no better school could be found. Nowhere were there such opportunities for learning the quality and strength of materials, the best methods of so arranging them as to produce the greatest effect with the smallest quantity, their price or cost of production, and, not less important, how to manage men in the face of uncertain and rather appalling danger. In the yard above, the elder Brunel carried on all sorts of experiments in construction, while in the tunnel below the results were put into actual practice under a natural penalty as heavy upon error or negligence as materially to diminish the occurrence of either one or the other.

Nothing could exceed the invention shown in the tunnel works, from the brick tower of great height and large diameter, laden with its creaking steam-engines, and which, after it had reached its height, to the astonishment of beholders, was seen to sink gradually until it disappeared in the earth and became, what it still remains, the lining of the great shaft; from this, at one end of the work, to the complex and ingenious shield at the other, all was utterly unlike anything that had before been seen. Here, not less by his abilities and genial temperament than by the courage which he showed when the water broke into the works, Isambard Brunel gained the respect and affection of the tunnel workmen, of every one of whom he knew the character and qualities, and whom he never neglected when they came in his way in after-life. It was while engaged upon the tunnel that Brunel turned his attention to the capabilities of railways, then scarcely known, so that



when shortly afterwards he, as a very young man, met with the Great Western promoters, he was able to convince them that he had studied the subject profoundly, and was prepared to fight their battles before the Legislature and in the field.

It is difficult for those who do not remember those days to realise the dense ignorance that prevailed upon almost all engineering subjects, not only with the world at large, but in the profession. George Stephenson had adopted his colliery gauge for the Liverpool and Manchester Railway, empirically, because he found it in use elsewhere, and without a notion of the speeds that would be obtained upon it. In January, 1829, the directors employed Messrs. Walker & Rastrick, the two leading engineers of the day, to report upon the power to be employed upon their railway, then within a few months of completion. Their report, printed in that year and now scarce, is a very curious production. They assume a speed of not less than ten miles an hour, and consider three sorts of locomotive power, by locomotive engines, by stationary engines, or by horses, and this for a line at the opening of which, but a few months afterwards, a locomotive engine actually attained a speed of 30 miles an hour! Having no experience of high velocities, engineers knew nothing of the effect of curves, or the limit of gradients, or of the weight or method of supporting the rails. Brunel's early reports to the Great Western show, what his tunnel friends were well aware of, that he had studied these matters with care so far as they could be studied in the absence of direct experience.

Among the subjects experimented upon at the tunnel were two of very great interest. One was a plan for turning large brick arches without centring; the other, the employment of condensed gas as a power. In the tunnel-yard was long to be seen a brick pier, from which projected 30 ft. in one direction a light half-arch of 60 ft. span, and in the other a shorter and heavier half-arch. The pier was built upon the ground, without foundation, and the two arches balanced. These arches were turned by the employment of Roman cement, and between each course of bricks were laid bands of various materials, from straw to hoop-iron, and thus the structure was erected without centring, and stood without the support of the other half-arch. It was found in the experiments connected with this result that clean-picked split straw, if compressed into a bar, had greater power than wrought iron of the same section of resisting a bending force.

Upon the gas engine Brunel and his father bestowed much labour, unprofitable in its immediate results; but the conduct of the experiments was of the highest service, at any rate to the younger engineer. It is a curious proof of Wollaston's sagacity that, at the commencement of the experiments, when consulted as to the gas to be employed, he said, "Yes; carbonic acid is, of course, the most economical, but there is something about it that leads me to fear that when condensed it will be slow in expanding; and this while Faraday's experiments were in their infancy."

In 1829 Brunel competed for the Clifton Suspension Bridge, and sent in four designs, for spans of 760 ft., 1,180 ft., 890 ft., and 916 ft., the two latter being the designs he specially adhered to. The directors consulted Telford, who, curiously enough, called Brunel's plans pretty and ingenious, but thought the structures would eventually tumble down in a high wind. He thought no span was admissible that was greater than his own at Menai; that is, a little below 600 ft.; the directors therefore called upon Telford himself to provide a design, which he did, but it was not liked, and certainly, if executed, would not have added to his fame.

A second competition was decided upon, and Mr. Davies Gilbert being the judge, and having heard Brunel in explanation of his design, it was adopted. The work was not proceeded with for want of funds, but the piers were constructed and the drawings completed in great detail. They exhibit a number of new and very ingenious contrivances for stiffening the platform against high winds, checking the vibration of the ironwork, and for securing a more equable distribution of the weight, and the prevention of any lateral strain upon the piers, which were to be enclosed in a casing of cast iron, upon which were to be represented in relief the various processes of the manufacture of iron, from its reduction from the ore to the fitting or completion of the bars of suspension. This intention should

be borne in mind as accounting for the bald and unfinished aspect of the piers as they now stand. The bridge, however, was not executed till after Brunel's death, and then with various modifications in the details. But what Brunel was capable of appeared in Hungerford Suspension Bridge over the Thames, built by him in 1845, a work of singular purity of design and of great engineering skill, having a main span of 678 ft., and two half-spans, of 343 ft. each. Unfortunately this bridge stood in the way of the Charing Cross extension of the South-Eastern Railway, and was replaced by the present Titanic structure, and the beauty of that part of the river has certainly gained little by the change.

The ability manifested in Mr. Brunel's designs, if lost upon Telford, was fully appreciated by the leading citizens of Bristol, who had also seen something of the young engineer then employed upon the works of the floating harbour. This led, in 1833, to his appointment as engineer to the Great Western Railway, then brought forward as a serious project. To this he at once devoted his whole attention. He made himself intimately acquainted with the country to be traversed, spent his days upon the ground and his nights in preparing the necessary details, and in travelling from point to point. He also organised a small but very able staff of assistants.

The public, however, was not as yet prepared to support the entire scheme, and in consequence application was made to Parliament for two lines, from Bristol to Bath and from Reading to London, thus omitting the intermediate portion, over which the line selected differed widely from that of the road then in use, and differed also in some important respects from that recommended by the engineer, which would have avoided the tunnel at Box, and the severe gradient, at that time supposed to be unworkable without the employment of assistant power.

Brunel's appointment as engineer to one of the principal railways of England radiating from London at once placed him in the foremost rank of his profession. All, indeed, could not judge of his skill as an engineer; but during the long and severely-contested battle before the committees of the two Houses of Parliament, he exhibited qualities which all were able to appreciate. By the clearness of his statements, his readiness and ingenuity in reply, his continual reference to principles in support of what many considered to be dangerous novelties, and by the overpowering strength with which he swept away the mathematical subtleties of Dr. Lardner, on whom the opposition mainly relied, he won the good opinion of the leading members of both Houses, of the Parliamentary bar, and of the principal commercial interests of the western counties. With this new phase of his career opens the second and principal chapter of his life.

G. T. C.

#### BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the fourth meeting of the session, held on the 18th inst., Mr. Thomas Morgan, F.S.A., in the chair, a large number of interesting exhibitions were made.

The first paper was by the chairman, on the subject of the Roman pavements found in Britain. After a review of various classical myths dwelt upon by the writers of the period, the lecturer proceeded to indicate that similar subjects were shown pictorially on the pavements in question, and that these subjects were almost always consecutive, so that if one or two were ascertained, the general scheme of the design might be recovered. The frequency of the subject of Orpheus on such pavements was referred to, and the principle was applied to the figures recently found at Norton Farm, Isle of Wight, in a manner to suggest several alterations in the designations given to them.

The second paper, on St. Agnes's Eve, by Mr. H. Syer Cuming, F.S.A. (Scott.), was then read. After reviewing all that is known of the saint's history, which is so doubtful as to give reason to believe that she never existed, attention was given to her representation in art, while the many superstitions practised on St. Agnes's Eve were discussed in detail.

**Berlin Heraldic Exhibition.**—We understand that the provisional committee for the English section of this proposed exhibition have dissolved.

#### THE ARTISTIC TREATMENT OF CONSTRUCTIONAL IRONWORK.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the sixth ordinary meeting of the present session, held on Monday evening last, Mr. Horacio Jones, vice-president, in the chair, the drawings made by Mr. W. A. Lethaby, Pugin Student for 1881, were exhibited.

Mr. J. Macvicar Anderson, honorary secretary, called attention to a plaster bust of the late Mr. E. M. Barry, R.A., presented by Mr. Wolfe Barry, C.E., and being a reproduction of a bust by Mr. Woolner. He also called attention to some bequests to the Institute by the late Mr. Decimus Burton, including the models of the arch at the top of Constitution Hill and of the entrance to Hyde Park, opposite; two drawings; and a sum of 100l.

On the motion of Mr. Octavius Hansard, seconded by Mr. David Brandon, it was resolved to thank Mr. Wolfe Barry and the executors of Mr. Decimus Burton, and to ask Mr. Woolner to advise as to waxing the bust or of taking other means to preserve it in good condition.

Mr. Hugh Stannus, Associate, then read a paper on "The Artistic Treatment of Constructional Ironwork." He commenced by observing that ironwork had not been fairly treated either by its critics or by the great majority of its friends. Its critics refused to use it, except in a very limited manner, because, they said, it was an unarchitectural material, wanting in bulk and monumental effect, and was neither suited to any historic style nor had one of its own. By its friends, the material had been, so to speak, prematurely "drawn out" and exhibited, like a precocious child, dressed up in clothes not its own. The late Professor Barry, in one of his Academy lectures, said:—

"Iron is a great difficulty to the artist. The architect is glad to take advantage of its constructional assistance; but the application to it of artistic design, to make it a thing of beauty, is a problem, hard to solve. Our studies of art are based on examples of the pre-iron age, and it is not easy to take a new departure, and to treat what may almost be termed a new material in its bearing on architecture on new principles appropriate to its nature. This, however, must be done if iron is to enter effectively into architectural design; and we may be sure that as men have now discovered and appreciated the gain which iron has brought to them they will not easily surrender it. The world will not stand still for architects any more than for other men, and if we do not avail ourselves of the materials at hand, others will certainly do so, and the great works of the day will develop more and more of an exclusively engineering character."

Mr. George Aitchison, A.R.A., in a paper read before the Institute in 1864, observed that if any architect of that day had any new floor in hand which he desired to hand down to remote generations, he would not use iron in its construction; but to those whose works were not of such transcendent character he would recommend the use of iron in construction. The objection against iron on the score of its lack of bulk and monumental character had been stated very eloquently by Ruskin in his "Seven Lamps." Ruskin argued that "true architecture does not admit iron as a constructive material," and others had objected to its use "until we had become accustomed to it." Those who used this last objection might be compared to the Irishman who said he would not be able to get his boots on until he had worn them a fortnight. As to iron being wanting in bulk, so was the Parthenon as compared with the Pyramids, and Salisbury Cathedral was attenuated in its structural forms as compared with those of Norman work. The objection that constructive ironwork had no style of its own, that it did not spring, Athene-like, fully-equipped from the brains of its first user, was unfair, having regard to the newness of the material as largely applicable to constructive purposes. It should be remembered that the Greek Doric took a long time in attaining maturity. Although iron had to complain somewhat of the treatment it had received from its enemies and critics, it had more reason to complain of the way in which it had been served by foolish friends, who had tricked out this Cinderella in the finery of her elder sisters. These borrowed clothes iron would in time outgrow, and she would then, it was to be hoped, get clothes of her own. Her own garb, in the shape of a fairly characteristic treatment of iron, a material no longer to be ignored, and demanding artistic treatment, was what he (Mr. Stannus) pleaded for. Having avowed his aim



to be the addition to what was mere construction of those qualities which raise a design into the domain of architecture, the author said he proposed,—(1) To state the negative laws; (2) to realise the data of the problem; (3) to suggest the path along which its solution was most likely to be found. The broad negative laws prescribed that constructional ironwork should be so designed as not to imitate the characteristic forms of dissimilar materials, such as wood and stone. Forms produced by undercut carving, like the Corinthian and Early English capitals, should not be used in iron, which could not rival their exquisite beauty. A second negative law was, not to carry on the mouldings and other forms of the wall against which iron may be placed. This was really but a special case coming under the first law. The practice alluded to was to be condemned as likely to lead to deception. The next negative law was, not to hide the joints and strengthening parts. The last negative law was, not to imitate natural forms. Thus in the selection of *motifs* cast-iron must not be ornamented with natural foliage. The prohibition was a case of the general law that in all mechanical repetitions the forms should be conventionalised. From a succession of the same flower or group of flowers repeated in cast iron, without either the infinite variety or the delightful crispness of nature, we turned away in disgust. Instances with reference to drawings, were given of breaches of these negative laws. The chief offender, it was pointed out, was cast iron, which was even made to ape the forms of wrought iron. As shaming such sham, the truthful, unaffected ironwork of the Crystal Palace was cited. Mr. Stannus hinted to those wishing to develop the proper treatment of ironwork that since they seemed to have somewhat lost the scent it would be better to hark back to this and other examples. Passing to the second division of his subject, the data of the problem, the author enumerated the advantages and difficulties of cast and wrought iron respectively as compared with stone or brick, and the resulting capabilities and necessities in construction, with a view to the development of the ornamentation from the construction, and to the architect's becoming possessed with the spirit of his material. This would enable him to accommodate its characteristic qualities. In favour of cast iron we had modelled surfaces, giving richness and hiding inequality; cheapness when there was a repetition of the same factors; largeness of pieces; easy renewal of parts; beauty of perforation when seen against the sky or light. Against it were rust and deterioration, whence the need of easy access to every part for frequent inspection and painting; the "strip" (incident on moulding in sand), preventing squareness; the difficulty of making the joints and bolts artistic. The advantages of wrought iron were: tensile value; lightness as compared with strength; largeness; easy renewal; beauty of perforation. Its disadvantages were rust, &c., as before; difficulty with joints, bolts, stiffness, &c., as before. To design ironwork, whether cast or wrought, so as to overcome these difficulties, and to produce works comparable with those in stone, with all the prestige of prescription on their side, was at present a hard task. But just as other difficulties in the world brought out man's nobler qualities, and just as it was not by shirking obstacles, but by surmounting them, that his pre-eminence was developed, so it was not by slurring over the special difficulties presented by ironwork, but by acknowledging and even emphasising them, and by developing the artistic treatment out of these very difficulties, that we should show the material by the character of the design. The curved form of the arch, and of that most perfect evolution from it,—rib-vaulting,—were both resultants from a disadvantage, namely, that the builders had only small stones and limited funds at their disposal, instead of those megalithic quarries and rich treasures which had rendered trabecate construction possible. So in iron architecture, if the forms were deduced logically from the difficulties of the material, there was a great future before it, and before any one who would take the trouble to master its capabilities. A great many suggestions were next given for designing in cast and wrought iron respectively. On the last head of his subject, Mr. Stannus pleaded for eclecticism as the most hopeful path of progress pending a gradual development in the right direction towards true independence. The Moresque style had been adopted for the

details of the Paddington Railway Terminus, Brunel's architectural collaborator, the late Sir Digby Wyatt, having turned to account the fact that the Moresque ornaments, being of plaster, were made in moulds, and were therefore adapted for reproduction in cast iron. Similar hints might be taken from the terra-cotta style which flourished in the valley of the Po during the fifteenth century. Some of the Indian buildings also, so finely illustrated by Mr. Ferguson, presented great wealth of suggestive detail for surface ornamentation. At the same time, the iron style of the future must be logically deduced, as well as eclectic. It should possess the purity of line and mathematical proportion of Greek architecture, the distributed surface decoration of the Mahomedan, the rich modelling of the Roman, the simplicity of the component parts of the Romanesque, and the economy of material, together with the constructive truth of the Gothic.

In the discussion which followed, Mr. Joseph Jennings remarked that Mr. Stannus had said nothing on the question of the protection of ironwork from rust, excepting by means of paint. Now, if architects might expect, as he hoped they might, that the processes proposed for preventing the oxidation of iron would succeed and be applicable to ironwork on a large scale, they would be in a different position in the future with regard to the use of iron for construction. He agreed with a very great deal that Mr. Stannus had said, and especially so in thinking that the use of hollow cylindrical columns of iron was an unsound application of the material. In his opinion, the section of iron supports should always, in preference, be that of a solid cross, presenting no internal surface which could not be got at. With regard to ornamenting constructive ironwork by piercing the webs of girders, &c., a great deal of good effect was to be obtained, combined with lightness, by punching, and punching could now be done so as in no way to injure those parts of the ironwork which adjoined the perforations. With regard to the practical objection against inequality of bulk in castings, pointed out by Mr. Stannus, that could be obviated, if necessary, and where cost was no object, by cooling the castings gradually and in any one part at a time, just as glass was annealed. He begged to propose a vote of thanks to Mr. Stannus for his paper.

Mr. A. W. Blomfield said he was reminded by Mr. Stannus's dictum that we ought not to resort to stone forms of ornamentation for imitation in iron, of a most interesting paper, which was read by Mr. Skidmore before the Architectural Association a few years ago, in which the author attempted to show that all architectural forms were originally derived from metal-work. Although there was a great deal about it that was visionary, it certainly was a very ingenious paper. In it Mr. Skidmore sought to show that the Corinthian capital itself was derived from what had previously been done in metal work. Mr. Stannus had not said anything about hammered ironwork for foliage, but a very beautiful capital might be made of wrought iron in that way. He thought that Mr. Stannus's hints about new forms in iron columns or stanchions were very valuable to be borne in mind, as was also his remark about designing buildings downwards, the plan of a building being obviously in great measure, if not entirely, dependent on the method of roofing. Mr. Stannus had not said anything about the charming Spanish ornamental ironwork, which was almost a study in itself. Mr. Blomfield concluded by seconding the vote of thanks.

Mr. J. P. Seddon said he was afraid he could only speak as one of the critics of iron as a constructive material, although of course he was glad to welcome any attempt to improve its treatment. In his own practice he had never used iron if he could possibly help it, for he had never quite seen the possibility of treating it artistically for constructive purposes. He had always felt it to be an unmonumental material, and he had often contrived to do without it, even for flooring large spaces, and had succeeded, at any rate to his own satisfaction. However, in view of the great probability that iron was likely to be much more largely used in the future, Mr. Stannus had approached the consideration of the subject in the right direction. No doubt, the artistic treatment of the material when used constructively was capable of being greatly developed, even though it might never be developed into what could fairly be called a distinct style. The use of ironwork constructively had been left too much in the hands of

the engineers. In this and in other respects it was an unfortunate thing that architects and engineers had come to be considered as two distinct bodies of men. There was no reason why this should be the case. Architects and engineers were equally constructors, and had to deal with precisely the same materials, the only difference being that the works of the engineer were generally on a larger scale than those of the architect. With regard to the suggestions for the treatment of constructive ironwork made by the late M. Viollet-le-Duc in his "Entretiens," they had always seemed to him (Mr. Seddon) the least satisfactory part of the work; some of them were even ludicrous, and were best left in the book, and not taken out for practical application. At the same time, if the design of constructive ironwork was more thoroughly studied in the spirit of Mr. Stannus's paper, he thought that great improvement would result, though he hoped that it would not fall to his (the speaker's) lot to have to make experiments in that direction.

Mr. Charles Fowler said that Mr. Stannus had read a very interesting paper, but the remark he made in it about concealing joints might be made to out in the opposite direction to that intended. The beautifully carved bosses seen in Gothic vaulting at the points where the ribs intersected, what were they but devices for concealing joints? Yet would any one desire to see those bosses removed? Even in the Crystal Palace, which, he agreed with Mr. Stannus, was an admirable example of the use of iron in construction, the joints were most scientifically concealed. He was not quite sure that he agreed with Mr. Stannus that in wrought-iron work the ornaments themselves should always form the metal itself should take the forms of the ornament. No doubt in the case of the web of a wrought-iron girder, or in any piece of iron bounded by rectilinear lines, ornament could well be formed by means of perforations, but he did not see that in a cast-iron girder the case was necessarily different. In the case of an ornamental cast-iron spandrel, too, he failed to see why the ornament should not be formed by perforations. Mr. Stannus had suggested that in any iron style of architecture that might be evolved, the abacus should, for consistency's sake, be made to follow the outline of whatever it had to carry, but in his (Mr. Fowler's) opinion that was not one of the necessary conditions of an iron style, for, as he need hardly say, square, octagonal, and circular abaci were used by the Gothic architects without any reference whatever to the contour of the superincumbent mass. He quite concurred with Mr. Stannus as to the necessity of designing a building downwards, and he believed that the roof of the Crystal Palace was the first part of the building designed. As to the concealment of iron construction, there was at least one instance in which he thought such concealment legitimate, viz., its application to the strengthening of concrete constructions, as used by the late Mr. Matthew Allen, who very fairly compared the combination of iron and concrete in that way to the bones and flesh of the human body. The use of such a combination of the two materials was likely, he thought, to be much extended, and with proper regard to the strength of varying forms was likely to be very useful.

Mr. George Elkington, jun., thought that Mr. Stannus had laid down some capital rules for the guidance of architects who might have to design buildings that were chiefly iron, but the great difficulty experienced by architects in the use of iron was how to properly use it in buildings where it only formed a part of the construction. To suppose a common case, that of a shop or warehouse where a wide and uninterrupted window-space was required on the ground-floor. In such a case, as everybody knew, resort was had to the use of an iron girder to carry the upper part of the façade, and it was a very common thing to conceal such a girder. Was it right to do so? If not, how would Mr. Stannus treat it? Again, would it be a legitimate use of iron in construction to make a façade of a kind of framework of iron, filled in with panels or slabs of terra-cotta or other material similar in *motif*,—say, to the marble slabs inserted in the façade of the Certosa at Pavia?

Professor Kerr said that he had long regarded the subject under discussion as one of the most difficult questions in modern architectural philosophy. It should be fully borne in mind that Mr. Stannus's paper was about the ironwork of architectural construction as distinguished from



the ironwork of ornamental art. The latter subject, he ventured to think, was very well understood, and had been well exemplified in many charming modern works. The ironwork of constructional architecture had been very largely illustrated, frequently by engineers and occasionally by architects, without any success to speak of. The question whether iron was to be a building material of the future was not easily answered in the affirmative, but, nevertheless, taking it to be so to some extent, no matter what, how ought it to be treated, with a reasonable amount of articulation, so as to be on a par with stone, timber, terra-cotta, and some other materials? That was a very large question, a question of strict logic,—and it should be remembered that artistic instinct was artistic logic, or nothing. Whether the problem was to be worked out or not, it was desirable that the profession should understand it, and it occurred to him, now that the Institute was becoming a wealthy body, some of its members, with ingenious proclivities and powerful minds, might direct their energies to the solution of the question if properly encouraged by the offer of rewards. The question was in what direction ought thought to be directed in the attempt at a solution? Now as to whether iron was likely to be a material much used for architectural construction in the future, his own opinion was that it was not, for it did not promise anything permanent or anything satisfactory in the way of that long permanence the idea of which was inseparably associated with architecture of the highest class. There was the fatal objection of the oxide, especially in a climate like ours, and the oxide formed so rapidly, and was removed so very readily, that it was a serious objection to the use of iron in construction. The use of paint was a most unsatisfactory way of meeting the difficulty, for there was no paint yet invented which approached perfection in arresting the oxidation of iron. The preservative process to which Mr. Jennings had referred had certainly been advertised a little, but he (the Professor) had not seen any exhibition of articles treated by it which gave promise of the process being generally used for the treatment of constructive ironwork. If, therefore, iron were used, it must be painted, and painted continually, and that was a continual element of expense. Even when painted externally, much of it could not be painted internally, and the action of the atmosphere on the internal portions of iron columns and girders was likely to be very serious in the space of fifty years. The treatment of iron as a mere matter of ornamental art, as used both in Medieval and Renaissance times for gates, railings, and so on, was not, as he had said, new in question. A great deal of good work had been done in that direction, but Mr. Stannus's paper dealt with the much more serious matter of constructive ironwork. Now, with regard to that matter, the real question was, how were architects to construct a great railway station (say), on the lines on which an engineer would build such a structure, and yet make it architectural in character? Engineers, as a rule, and to their credit, did not pretend to treat ironwork in any other way than structurally. The materials available for iron construction were, shortly, two,—cast iron and rolled iron,—for malleable iron in construction might be regarded as rolled iron, and as being available only in a very limited range of forms. Then the designer of iron constructions had to bear in mind, as a most striking distinction between cast and rolled iron, that whereas cast iron, as regarded resistance to tension and compression, stood as 1 to 6 respectively, rolled iron, as regarded the same resistances, stood practically as 1 to 1. That distinction pointed to two essentially different modes of designing in iron, if, as on true architectural principles should be the case, ironwork was to be designed on the basis of its own conditions; and if it were not articulated precisely on the basis of its own conditions, it was not architecturally treated, but was a mere sham, as all architects' ironwork always was. Engineers' ironwork, on the other hand, was not a sham, because there was no attempt at making it beautiful. Cast iron, as everybody knew, was a very treacherous material to use in construction, and it was, happily, going out of use more and more. The range of forms possible in rolled iron was very limited: whence, then, was to come material for an iron style, while, as Mr. Stannus had hinted, architects considered themselves tied by traditional architectural forms,—forms which were tied to other

materials, and which it was impossible to dismiss from the mind all at once? All art, it should be remembered, was extremely slow in its development, and it might, he thought, be safely concluded that if ironwork continued to be as largely used as it was now for constructive purposes (as to which he was doubtful), something in the way of its architectural treatment would be the outcome. We of the present generation were not, he thought, to repine because we did not seem to be likely to accomplish it. It might require a century for its development. But, at any rate, there was plenty of room for attempts in the way of an improved treatment of constructive ironwork. As to sham architecture in ironwork, the extent to which it had been carried in America was something astounding. For instance, the whole of the dome of the Capitol at Washington, and of the two peristyles which surmount it, were of cast iron, no doubt very carefully designed and calculated, but such was an utterly wrong application of ironwork to the purposes of architectural construction.

Mr. C. F. Hayward said that constructional ironwork applied to architecture was carried out a good many years ago with a great deal of *clat* at the Oxford Museum, to a great extent, he believed, with the help of Mr. Ruskin. That work was done by Mr. Skidmore. As regarded colour, how was ironwork to be treated in colour, associated as it sometimes was with red brick, sometimes with stones of different colours, and sometimes with white marble?

The Chairman, in closing the discussion, while thanking Professor Kerr for his remarks, said he must differ from the view expressed by him against the beauty of suspension-bridges. He (the Chairman) thought that one of the most pleasing modes of employing iron in its tensile use was in suspension-bridges, and such structures, he thought, were often very charming elements in a landscape. With regard to the paper, he had always thought, and he still thought, that iron should be treated as a distinct material, and as having a distinct use as compared with other materials. In regard to the desire manifested for improvement in iron construction, which was a very laudable one, it was not, he thought, a hopeless one. The art of architecture was accumulative and progressive, and much was to be hoped for in the future. The first use of wrought-iron girders in buildings was quite within the memory of most gentlemen present. He thought that one of the first instances of their use was in a floor constructed from his plans some thirty-five years ago, the girders being made by Messrs. Finch, who built the Chesport Bridge. Since that date there had been a vast improvement in the manufacture of girders, both in respect of strength and economy of material. In conclusion, the Chairman put the vote of thanks, which was carried unanimously.

Mr. Stannus, in the course of a few observations in reply, said that in his paper, as written, he had treated somewhat in detail the subject of the painting of ironwork, but in order to save time in reading he had out that part of his paper, which could however, if desired, be printed with the rest of it in the Institute "Transactions." Mr. Blomfield had alluded to the possibility of making the foliage of a Corinthian capital in wrought iron. That he did not deny; indeed, Huntington Shaw's gates, formerly in the grounds of Hampton Court, but now in the South Kensington Museum, were good illustrations of the possibilities of foliage in beaten ironwork. He quite appreciated the beauty of the Spanish ironwork mentioned by Mr. Blomfield, but he did not think that it came quite within the scope of his paper. He did not think that the use of carved bosses at the intersection of ribs in stone vaulting, cited by Mr. Fowler, was quite apposite as an argument for the concealment of joints in structural ironwork. He agreed with Professor Kerr (whose remarks would form a valuable appendix to his paper) that cast iron was a treacherous material, but he chiefly advocated its employment in situations where it need not be depended upon for strength. In conclusion, Mr. Stannus expressed his fear that the discussion of the subject was perhaps more incomplete than he had hoped it would have been. When he received an invitation to read a paper on the subject, he had looked forward to hearing the mature views of their late President, whose great and rare ability would have justly entitled his opinions to great weight.

The meeting then terminated.

#### BUILDERS, SPARE OUR TREES!

We have never ceased to fight against the thoughtless destruction of greenery which, in most instances the growth of many generations, it would be impossible to replace. There is more than one side to the question; there is something more than the sentimental view to be taken of the steady advance of our metropolis on the green fields that within the memory of even youngsters have been covered with long streets, with acres of crescents, of squares, and of gardens,—gardens in which, let it be noted, sickly shrubs are replanted where, perhaps, grew before stately trees; in which imported acads are made to replace the meadow grass that preceded the work of the builder. Londoners of the West End have cause to be grateful to the careful regard with which in and about the neighbourhood of the Redcliffe and "Boltons" estates the noble old trees have, in so many cases, been preserved, and we have only to contrast this portion of the suburbs with those in the north-east of the metropolis, where such terrible devastation has been committed, to recognise the enormous advantage obtained by so worthy and proper a regard for nature.

There is, we repeat, another than the sentimental view to be taken of this thoughtless plan of destroying the old trees on an estate "to be laid out for building purposes." Is it not the very love of greenery, of the open air, of plants, that tempts yearly thousands of inhabitants from the crowded city to reside in the suburbs, even at inconvenience to themselves? To how many of these thousands is not his garden the chief pride, to which he hurries home at night, for which he buys his seeds, his rose-bushes, from which he brings to town his flowers, in which he gathers his hardy-grown strawberries, and those red currants and raspberries which in the Sunday tart taste as no other currants and raspberries in the world? A love of greenery is deeply implanted in the bosom of undeified human nature. If it be true, as some of our scientists have asserted, that the origins of our species are clearly indicated in the love which all children show for grubbing in the earth, it is equally noteworthy that this love does not fade with growing years; and yet with the acknowledged fact we see tree after tree vanish round the metropolis before the steady advance of bricks and mortar.

There are, in addition to the sentimental regrets for the disappearance of our old trees, other reasons why such unthinking action should be prevented where possible. The hygienic value of trees has long been explained: their power to absorb the vitiated air, and apparently to breathe out a healthy atmosphere,—a property possessed by many trees, but as far as we know most strongly developed in all the *Eucalypti*. But there is another argument in favour of the trees being spared in those neighbourhoods which are now so rapidly being swallowed up by the necessities for housing our increasing population. Did not the builders and land-owners fully understand that many a hesitating tenant might be secured by the presence of an old tree before his door or in his garden, or even for the matter of that in his neighbour's garden, we should, we suspect, hear less of the destruction of the trees which are still scattered round the capital. More than one of our readers would, doubtless, be able to mention instances of a similar nature to those which we might bring forward, to show the existence on the part of tenants of very decided views regarding the trees on their property. We remember the case of an expiring lease, the renewal of which was a matter of debate, decided by the thoughtless destruction by the landlord of a lovely tree; though it may be urged that this was the sentimental expression of a tenant who could afford to pay for his sentiment, such feelings actuate none the less the occupants of those acres of bricks and mortar with which our industrious builders are belting our metropolis and cutting us off more and more from the green country outside, which but a few years ago stretched into our very midst.

Why is it that at this moment the proposed park at Paddington is receiving such attention? It is because it is feared that a large tract of greenery may disappear, and its value to the people is greater than money they would obtain from the capitalists. To what purpose is it that we expend enormous sums on the purchase of breathing-spaces in our cities? To what purpose is it that heavy rates are levied for the beautifying of our public gardens, that trees are



planted,—where unthinking opposition is not opposed to their beneficial presence,—while we are allowing the free gifts of nature, gifts which have taken centuries to mature, to be destroyed about us?

#### LIVERPOOL ENGINEERING SOCIETY.

The first meeting of the eighth session of this Society was held on the 18th inst., at the Royal Institution, Colquitt-street, the President (Mr. F. Salmon) in the chair.

After the usual business, Mr. H. F. Bellamy read a paper on "The Plymouth Corporation Waterworks." He showed that prior to A.D. 1590, the chief source of supply was from wells in the town, and that the Corporation, finding this supply inadequate, obtained an Act of Parliament,—a brief extract of which was given, and which continues to the present day,—to introduce a supply from the river Mersey, by means of an open channel or "leat." With reference to proposed improvements, he stated that the supply still being inadequate, a storage reservoir of about 350 million gallons capacity is to be constructed within the water-shed of the river Mersey, above the Head Weir. The resources of this water-shed he showed to be very great. The pipe line is to be extended about five miles to Roborough Down, and a series of settling tanks and an intake reservoir constructed there.

#### SMOKE ABATEMENT IN THE FOURTEENTH CENTURY.

We have recently noticed and quoted in these pages the warm and well-worded complaint of a writer of the seventeenth century against the smoke nuisance that then troubled the metropolis, and from which we are still suffering, in spite of the loud outcry that has once more been raised. For 600 years, however, it would appear that Londoners have been uttering the same complaint, as any one may see who will open that sturdy archaeologist old Stow's "Survey of London," almost on the very first page of which will be found detailed the grievances brought against the use of sea-coal as early as the reign of Edward I. The king, evidently memorialised on the subject, as we should now say, issued a proclamation prohibiting the use of sea-coal, and punishing with penalties which one would almost wish to see revived, those owners of furnaces or chimneys which, after due notice, continued to be-foul the air with ill-consumed smoke. The measures adopted were rather of the preventive than the curative order, but the effect produced seems temporarily at least to have attained the object desired.

It was formerly thought,—remarks Styrpe in his continuation of Stow's Survey (London, 1754),—to contribute much to the preservation of the good air of the City that nothing was burned here but wood or charcoal, and that even in trades where much fire was used. But when workmen living in the outskirts of London began to bring in the burning of sea-coal, which was about the reign of Edward I., it was much complained of as tending greatly to the making of the place unhealthful. About the latter end of that king's reign it was that brewers, dyers, and other artificers using great fires began to use sea-coal instead of wood and charcoal, in or near the City, which occasioned the prelates, nobles, commons, and other people of the realm resorting thither to Parliament, and upon other occasions, with the inhabitants of the City and the villages of Southwark, Walbrook, and East Smithfield, to complain thereof thrice, one time after another, to the king, as a public nuisance corrupting the air with its stink and smoke, to the great prejudice and detriment of their health. The king, therefore, first prohibited the burning of sea-coal by his proclamation, which, disobeyed by many for their private lucre, upon a second complaint he issued a commission to inquire of all such who burned sea-coal against his proclamation within the said city or parts adjoining, and to punish them for the first offence with great fines, and upon the second offence to demolish their furnaces, kilns, &c., wherein they burned sea-coals, to see the proclamation strictly observed for time to come, as a record, 35 Ed. I. (1307), informeth.

That custom is second nature is proverbial, and much, it appears, is the case in regard to the use of "sea-coal," for though we find Evelyn complaining of its abuse,—Evelyn, it must be remem-

bered, had lived a long time in the clear atmosphere of foreign wood and charcoal burning cities,—Londoners at all times have accustomed themselves to the thick atmosphere of their capital. It is an old story that the City clerk, once allowed a holiday after many years' stay in town, found the air at Hampstead "rather thin"; and so it is, we suppose, that we find Styrpe, writing almost a century after Evelyn, remarking that the use of coal as fuel "is no where in these days reported a public nuisance." Such, however, is not our opinion a hundred and fifty years ago after Styrpe. We have borne the evil now 600 years; that, we think, even for Englishmen, is long enough. At long intervals we have exercised the thoroughly English privilege of grumbling; it is surely time now to act.

#### SUGGESTIONS FOR THE CONDUCT OF ARCHITECTURAL COMPETITIONS.

In October last, the Council of the Royal Institute of British Architects ordered a digest to be prepared on the basis of the suggestions sent to the Lord Provost of Glasgow by them in reply to an application for assistance by the municipal authorities of that city in framing the conditions of the competition for their proposed new municipal buildings,—the said digest to ultimately take the place of the Institute Official Paper on Competitions. On the 30th of December approval was formally given by the Council to the following amended paper:—

1. The promoters of an intended competition should, as their first step, appoint one or more professional assessors, architects of established reputation, whose names should be published in the original advertisements and instructions, and whose decision should govern the selection of the designs in all stages of the competition.

2. The duty of these assessors should be,—

a To draw up the particulars and conditions, or to advise upon and supplement them if already drawn up.

b To determine which of the designs conform to those instructions.

c To exclude all others; and

d To advise the promoters on the relative merits of the designs admitted to competition.

3. Every member of the body promoting the competition, and every assessor engaged upon it, should abstain absolutely from taking part in the said competition, or from acting as architect in the execution of the proposed work.

4. The number and scale of the required drawings should be distinctly stated, and they should not be more in number or to a larger scale than necessary to clearly explain the design. If perspective views be required, they should be uniform in size, number, mode of colouring, &c.

5. Competitions should be initiated either by inviting preliminary sketches, preparatory to a final competition, or by personal invitation. The promoters, with the advice of the professional assessor or assessors, should select from such sketch designs not less than — (here specify the number), the authors of which should be invited to join in a final competition, in which it is desirable that each should be paid for the preparation of his design a sum to be fixed by the promoters, with the advice of the assessor or assessors. The author of the design selected from among these should be employed to carry out the work, and the other designs returned to their authors.

6. Each design should be distinguished only by a motto or device, and any attempt to influence the decision of the promoters, or of the assessor or assessors, should disqualify a competitor.

7. A design ought to be excluded from a competition:—

a if sent in after the period named (accidents in transit excepted);

b if in violation of the instructions;

c if it do not substantially give the accommodation asked for;

d if it exceed the limits of site; and

e if the Assessor or Assessors (with or without the assistance of a surveyor) should determine that its probable cost will exceed by 10 per cent. the intended outlay or the estimate of the competitor.

8. All the submitted designs, except any excluded under clause 7, should be publicly exhibited after the final award. The report of the

assessor or assessors, and the decision of the promoters, should be published at the time of exhibition.

These suggestions have not yet been adopted by the general body of members of the Institute, but will come up for consideration at the meeting to be held on Monday, the 20th of March.

#### THE ST. PAUL'S INSTITUTE AND LIBERAL CLUB, BURTON-ON-TRENT.

THE extensive block of buildings which has been erected near St. Paul's Church, by the munificence of Mr. M. T. Bass, M.P., who has borne the whole of the cost, was opened on Saturday last. The buildings are Gothic in style, and have been erected from the designs and under the superintendence of Mr. Reginald Churchill, architect. The main entrance is from Rangemore-street, under a portico with five arches, supported on columns of red Mansfield stone and Hopton Wood stone, with polished grey granite bases, and foliated caps and cornices. On either side of the inner porch are rooms which serve the double purpose of class-rooms for the Sunday-school and of cloak and reception rooms when used in connexion with the large hall. The latter, which is 100 ft. in length to the back of the organ-chamber by 40 ft. wide, is faced internally with red and white bricks in patterns, with a dado of red glazed tiles. The side walls are divided by stone piers into eight bays, and the roof principals spring from the caps of these piers. The roof is open to the hall, and coiled in pitch pine. The most prominent external feature is the clock-tower at the south-east angle of the buildings. This is 86 ft. in height, and the porch beneath it forms the entrance to the Liberal Club. The furniture of the club is of oak throughout. The general contract has been carried out by Messrs. Lowe & Sons, assisted by Mr. De Ville as joiner, and by Messrs. Pickering Bros. as plumbers. Mr. P. Stevenson, of Wednesbury, has carried out the whole of the decorations. These are well spoken of, Lincroft-Walton being, we note, largely used therein. The clock in the tower strikes Cambridge chimes upon four bells, and these and the hour-bell,—weighing 19 cwt.,—have been supplied by Messrs. Taylor & Son, of Loughborough. The whole of the tiles on the floors and walls have been supplied and fixed by Messrs. Minton, Hollins, & Co., of Stoke-upon-Trent. The carving throughout the building has been executed by Mr. S. Tinkler, of Derby. Mr. E. H. Cogwell acted as clerk of the works during a portion of the progress of the work.

**A House in Dorchester.**—A handsome mansion is now in course of erection, in the higher part of High West-street, for the Hon. Mrs. Ashley. The architects are Messrs. Crickmay & Sons, of Weymouth, and the style of architecture is of a Classic character. The principal part of the building faces and runs flush with Dorchester's picturesque main thoroughfare. It adjoins the Shirhall. The materials used in the construction are light bricks for some of the walling, and the rest, and all the dressings, are of Bath stone. The roof line is broken by two pediments, and by an open stone balustraded cornice running between and at either end. The pediments, of course, cut into, and rise considerably above, the cornice. The pediments are carved, and so are all the capitals which surmount the various pilasters. The whole of the carved work is being carried out by Mr. Harry Homs. The servants' apartments and offices occur in two wings, annexed to and running out at right angles from each end of the building. These are connected below ground by a subway. The contractor is Mr. George J. G. Gregory, a builder of high standing in Dorchester.

**Proposed Academy of Art in Wales.**—The *Rhyl Journal* says that a movement is on foot among the artists resident in Wales to establish a Welsh Society of Arts. Though a Royal Academy has existed in England for more than a century, and the Scottish and Hibernian Academies are old institutions in Scotland and Ireland respectively, yet Wales has no kindred society. The majority of the artists resident in Wales, and those connected with the Principality, have, it is stated, agreed to form themselves into a society, with the objects of holding annual summer exhibitions at Llandudno.



## THE INTERNATIONAL ELECTRICAL EXHIBITION.

MUCH important and costly work has been done and much activity is being exercised, in preparing for this, that will prove probably the most attractive certainly, and literally the most brilliant show that has ever been made at the Crystal Palace. A visit this week will have made it apparent that much remains to be done before the preparations and arrangements can be pronounced complete. The fixing of the date for the presentation by the Lord Mayor of the prizes awarded at the recent wool and wool-manufacturing exhibition, will, it is expected, so stimulate exhibitors as to secure completion of their work on or before the date referred to, — January 31st. Exhibitors and their representatives, who took part in the Paris Electrical Exhibition, and others, express freely the opinion that this will be incontestably the most comprehensive and imposing display of electrical appliances that has ever been made in either the Old or the New World. This may be inferred from the fact that there will be upwards of 250 exhibitors, and an aggregate number of exhibits too large to admit of even an approximate estimate being given without great expenditure of time. A notable and novel feature in this exhibition, and one that will give public satisfaction, it may be supposed, is that it has the endorsement and direct encouragement of Her Majesty's Government. The provisional catalogue has in the fore-front fifty-six entries relating to exhibits from the Government Postal Telegraph department. Many of these entries relate to groups, not to single objects; as, for instance, there are four sets of testing-apparatus, eleven items of apparatus connected with pneumatic tubes, six relating to historical telegraphic apparatus, three to the first laid cables, four to coils and needles, six to "keys," eight to "relays," three to iron line wire joints, three to railway signalling instruments, seventeen to lightning protectors, thirty-two to insulators, a collection of ten batteries, and specimens of twenty-one submarine cables in use now by the Post-office Telegraph department. The exhibits from the War Office department had not arrived when the provisional catalogue was printed. They are now, however, delivered, and are numerous, important, and highly interesting; they are being arranged and looked after by a detachment of Royal Engineers.

The main body of the exhibits is grouped in fourteen classes, that include static electricity, batteries and allied apparatus, magneto-electric and dynamo-electric machines; cables, wires, conductors, and allied apparatus; apparatus for measuring electricity; telegraph signals and allied apparatus; telephones, microphones, and photophones, including, among many wonders inconceivable a little while ago, "telephone signal apparatus for submarine intercommunication between several persons at one time." The provisional catalogue needs correction in some places; as, for instance, under "Class VIII, Electric Lighting," it is stated that "the Crystal Palace Station of the London, Brighton, and South Coast Railway is entirely lighted by Jablochhoff," whereas that station is usually not lighted at all, more than by a few feeble jets of bad gas, that only serve to make "darkness visible." Portable electric lamps are shown in this class. Other classes are electric motors and transmission of energy; electro-medical apparatus; electro-chemistry; magnets, compasses, horology, instruments of precision, &c. The miscellaneous, indispensable in many attempts at classification, includes, — electrical automatic fall-tale tills; tell-tale clock for watchmen; a rotating table, sewing-machine, improved cement, non-magnetisable watches, electric camera, advertising and electric signs, asbestos articles, and electric toys. The last group in the arrangement is of generators, steam, gas, and hydraulic engines, &c., applicable to electric industries. Foreign exhibitors, of whom there are about ninety, have their exhibits grouped in the same manner as the English exhibitors. The foreign miscellaneous embraces various motors for toys; an automatic silk-reeling machine; automatic analyzer of fire-damp; egg-hatching machines and artificial mothers; artificial feeders, and electric testers for eggs.

Among the Post-office exhibits are a model of a cable-ship, a diagram showing the remarkable growth in the number of Post-office telegraphs from the date of the transfer of the telegraphs to the State up to the present date, and an illustration

of Norwegian woodpeckers piercing telegraph-poles in search of insects, that the birds possibly imagine to be in the wood from the humming sound produced by the wires. From Mr. C. Nielson, Chief Director of the Norwegian Telegraphs, a very interesting chapter is quoted in the official catalogue on the impression produced on birds, bears, and wolves by the humming sound of the telegraph wires. A few of the exhibitors have shown their lights partially, but none of them perhaps so fully as Mr. T. A. Edison. He lights up the concert-room with chandeliers, with festoons over the front of the gallery, and pendants with four lights under the gallery.

## THE GERMAN GOVERNMENT AND ARCHITECTURE.

A REMARKABLE step has been decided upon by the German Government in connexion with the subject of architecture. In order that the building, architectural, and engineering professions in Germany, whose members are to a large extent Government officials, may obtain early and complete intelligence as to what is being done abroad in the way of architecture, it has been determined to appoint an architect as an *attaché* to each of the principal German embassies in foreign capitals. It is announced that the first appointments will be made to the embassies in Paris and Washington. It will be the duty of these architectural *attachés* to make regular and complete reports of all the new inventions of importance in connexion with architecture and engineering in the respective countries in which they are appointed. They will likewise have to report upon the principal new edifices of importance in course of erection, and to give an account of all features of novelty and value in such buildings.\* In this connexion it may be added that the German Government has also appointed an architect, as a permanent official, in connexion with the German Archaeological Institute at Athens. The gentleman appointed is Herr W. Dörpfeld, who distinguished himself as the technical chief throughout the excavations at Olympia, where he was engaged for four years. He enjoys the favour both of the Hellenic Government and of Dr. Schliemann, for both of whom Herr Dörpfeld is expected to be employed to conduct important researches.

## THE GERMAN PARLIAMENT HOUSE.

At length, after ten years of irresolution and debate, the German Parliament has adopted a resolution in accordance with which immediate steps will be taken to carry out the project of erecting a permanent and worthy Imperial Parliament House. For years there has been a sum of nearly a million and a half sterling lying ready for this purpose, but the conflict of opinion as to the proper site has hitherto prevented anything being done. It has now been decided that the site shall be on the Königs Platz, Berlin. This place lies a little to the north of the Brandenburg Gate, outside the old city boundary, and not far from the end of the fine avenue, Unter den Linden. It is in the centre of the Königs Platz that that singular monument, the Column of Victory, is placed, which commemorates the triumph of the German arms in 1870 and 1871. The only spots available for the new House are two in number. One is occupied by Kroll's Theatre, the other by several buildings belonging, some to Count Raczynski, and other private owners, and others to the State and Municipal authorities. The Kroll Theatre site has been declined, and the latter chosen. It is rather smaller than the site contemplated at the time of the International competition for designs for the new House. Instead of being 150 metres long by 115 metres wide, the dimensions required have been reduced to 136 metres by 95. The reduction in the area has, of course, caused a modification in the original designs, and it is probable that the residences originally intended for the President or Speaker, and some other officials, will either be omitted or much curtailed.

As regards the cost of the entire scheme, the site will altogether cost 8,135,000 marks, or 406,750*l.* sterling. The private property which

\* The German Government propose, in fact, to endeavor to effect at once throughout Europe what an individual in England thought it desirable to attempt, by the establishment of a modest Bursary, to obtain gradually for the advantage of architecture and the public in England,

will have to be bought will cost 6,700,000 marks. The Prussian Treasury owns another portion of the site, which it will present gratis to the German Parliament, only requiring to be indemnified to the extent of 1,435,000 marks for the buildings, which it owns there, and which will have to be replaced by new edifices elsewhere. Finally, the Berlin Municipality grants gratis another portion of the required site, which is now occupied by part of a street.

With regard to the cost of the building, the Government estimate places it at 14,400,000 marks, or 720,000*l.* sterling. Adding to this the cost of the site, 406,750*l.*, the total cost will amount to 1,126,750*l.* sterling. The funds already at the disposal of the Parliament for the purpose of erecting the new palace are 29,593,573 marks, or 1,479,678*l.*, so that unless other changes are made, and if the architects keep within the estimate, there will be a surplus of 352,928*l.* It is, however, by no means certain that some more or less extensive modifications will not be made in the designs which would necessitate a larger expenditure than that here mentioned. So far as the site is concerned, the Imperial Parliament have already made the necessary grant for the purchase.

The next step will be a re-examination of the plans which were successful at the competition ten years ago. There appears no chance of the late Sir Gilbert Scott's Gothic design being realised, although it was one of the four that obtained prizes and was much admired. The first prize was won by Professor Bohndstedt, of Gotha, and, although there are many leading architects who urge that it would be better to institute another competition, it seems likely that Professor Bohndstedt's design will be adopted in its main outlines, with, of course, the necessary modifications required by the smaller site and some other considerations. In order to carry out the scheme a committee has been resolved upon, to consist partly of members of the Federal council and partly of members of the Reichstag, under the presidency of the Chancellor.

## SHEFFIELD SCHOOL BOARD COMPETITION.

At the last monthly meeting of the Sheffield School Board, the following report, in respect to the school proposed to be built at the Huntsman's Gardens, Attercliffe, at a cost of 12,000*l.*, including furnishing, architect's, and other professional charges, was submitted:—

The Buildings Committee have carefully considered the fifty plans sent in for competition. At the outset a day was given to a general consideration of the whole, and fifteen were set aside as more nearly complying with the instructions to architects than the rest. At a subsequent meeting the number of selected plans was reduced to five, and these have since been very carefully re-examined. On closely comparing these with the instructions, the committee came to the conclusion that the plans marked "Dux" (in A B C), plan A, for the Mixed School, and that marked "Dux" (in A B C), plan B, for the Infants' School, with some slight modifications, be recommended to the Board for acceptance, subject to the conditions set forth in the instructions of the Board, and provided that a contract be obtained for carrying out the works for the specified amount. The committee further consider that on the whole the plans submitted under the motto "Que je surmonte," come next in merit, and they therefore recommend that the premium of 25*l.* be awarded to the author of that design.

The other plans on the list for the final selection were marked respectively, "Great Faith," "S.S.B.," and "Truth."

The Chairman, after the plan was chosen, announced that it was discovered to be that of Mr. O. J. Innocent, architect, of George-street, Sheffield, and the other in order was the production of Mr. J. B. Mitchell-Withers, architect, Surrey-street, Sheffield. It was also stated that "Great Faith" was sent in by Messrs. Bellamy & Hardy, of Lincoln; "S.S.B.," by Mr. F. W. Roper, of London; and "Truth," by Mr. John Sidebottom, of Preston.

We shall illustrate Mr. Innocent's plans.

**Hexham Surveyorship.**—At a meeting of the Hexham Local Board, held on the 16th inst., Mr. Robert Groves, Assistant Borough Surveyor of South Shields, was unanimously elected Surveyor to that Authority. There were sixty applicants for the appointment.



# PRINCIPAL FAÇADE OF THE PALACE OF KING DON PEDRO, SEVILLE.

FEW monuments of Spain have been more incorrectly spoken of than has the famous palace, the principal façade of which we illustrate in our present number. It has been generally believed that this building was erected by Abdal Aziz, and restored by Don Pedro, without taking into account the fact that the building bears on its façade the evidence of its origin, which points to the conclusion that it was Don Pedro who ordered its erection. At the completion of the work, to which the monarch had devoted himself from the year 1353, Don Pedro ordered a broad fillet to be inserted in the upper part of the façade, on which was carved the following Arabic inscription in Cufic characters, repeated and arranged in such a way as to read, "There is no other conqueror than God." Its border has another inscription, in thick mosaic characters, which runs, "The most high and most noble and most powerful and most victorious Don Pedro, by the grace of God, King of Castille and of Leon, ordered this palace and its portals to be erected, which were completed in the year one thousand four hundred and twelve." This palace has been regarded as one of the most important monuments of the style of architecture then prevailing on the banks of the Tagus, whence are said to have come the artisans who, with the aid of the architects and builders of Seville, succeeded in carrying out the fantastic ideas of the king of Castille. Raised as the edifice was a little later than the Alhambra at Granada, it may be considered to represent a transition from the Granada style, the palace there bearing a close resemblance, especially as regards ornamentation, to the Seville edifice of Don Pedro.

## NEW SCHOOL FOR THE REV. JAS. REPWORTH, YORK.

THE building will hold eighty boys and eighty girls, and will be built of stock bricks, with terra-cotta and stone dressings. Mr. Repworth bears the entire cost, which will be about 1,200l. Two class-rooms are provided, and small playground at the back. The architect is Mr. Henry Nathan Smith, of Chesham, Manchester.

## RAISED FLOCK PAPERS.

THE design shown is intended for a raised flock, and, if based upon any style at all, is in that of the Greek method of brush-work, which, as will be seen, lends itself readily to the material selected. The repeat is 21 in. by 17 in., that is, two acres, but it could be reduced to three acres, if desired, and used either as a dado or filling, while the cost would be very little more than that of a fairly good ordinary paper, and it would last for a great many years.

The chief objection urged against the use of raised flock papers has been that they hold dust. While not prepared to deny this, the amount of dust so held is small and might be removed by a periodical brushing without in the least injuring the pattern, and even washed and scrubbed if previously flatted, while there is still left this advantage, that the flock could be hung in its natural colour; when dirty, coloured, and then from time to time washed, as suggested. In paperhangings it has often been contended that the unavoidable flatness of colour and want of relief were antagonistic to the artistic qualities they might otherwise possess, and that for the want of this relief it was impossible to get broken colour, or a completely satisfactory decorative result. To meet this difficulty various efforts have been made from time to time with more or less success, but of all the mechanical inventions, be they expensive or cheap, nothing has been done which has been so successful as the invention of raised flocks.

Although flock papers are by no means a modern or (that misused word) æsthetic invention, seeing that they were printed in England as early as the sixteenth century (indeed, examples may still be seen, in beautiful preservation upon the walls of Hampton Court Palace), yet the raised flock papers now so universally used were first printed by one of our best and oldest houses of paper-stainers about 1853, and taken up a few years after as a speciality by a leading London firm.

Since that time such has been the demand for them that there is hardly a house of any importance that does not manufacture raised

flock paper, and that, too, in great quantities, the success depending mainly on the pattern.

As to this point, it is by no means an easy matter to design a pattern to meet all the requirements of the material and manufacturing process. No foreshortening is permissible. Neither is it possible to use delicate details, or support badly-formed lines by shading degrees of depth, while naturalistic treatment of any subject is opposed to the nature of the material. Designs for raised flock should be carried out in a more or less conventional treatment, the shade being broken up into equal proportions of work and ground. The advantage, where there is a doubt, should be on the side of the ground, which should always make the outline which divides the various parts of the pattern.

The use of raised flocks has been the means towards advancing the true principles of decorative design, especially those applied to flat mechanical decoration. Inasmuch as these true principles include the proportionate distribution of form, the single-colour complement; the avoidance of foreshortening, or purely naturalistic copyism; the use and inclination towards proper constructional lines, and careful rejection of all unnecessary detail; it has followed that as the material and manner of manufacture so imperatively demanded their observance, the artists and designers have been compelled to give more thought and attention to these principles, as well as obedience to the necessity of applying them. And the claim raised flock has to its position as a legitimate decorative material can be based upon no sarer foundation than that the very material compels an observance of these invariably accepted laws.

Rooms hung entirely with raised flocks may be made to have artistic and complete effect, even when left in their original state. If a richer colour effect is desired, they can be flatted, and a still richer result gained by simply rolling the parts in relief. As a rule, four printings are sufficient to give the required relief, which is just deep enough to throw a shadow that does not cover up the ground, and give the effect of pierced work. It can, however, be printed in much higher relief when required, as it sometimes might be for large ceilings, friezes, &c. As to its durability, there are numerous examples to be seen on the walls of the Houses of Parliament and other public buildings, which have been up for more than a quarter of a century, their original colours still in good condition. G. C. H.

## THE CENTRAL STATION OF THE VIENNA CIRCULAR ELEVATED RAILWAY.

WE publish this week an illustration of the proposed Central Station on the Franz Josefs Quay, near the Bourse, and on the banks of the Danube Canal, intended as the chief station of the Elevated Circular Railway, the project for which is now before the Municipal Corporation of Vienna, and has already received the warm approval of the Austrian Government and the railway authorities.

The terminal stations of the seven principal lines of railways approaching Vienna are all situated outside the second circle of ancient ramparts, and consequently at considerable distances from the thickly-inhabited parts of the city, which lie principally within the old lines of fortification. These lines also form the limits of the *cetrol*, and consequently there is an additional tax, in addition to an extra cab fare, imposed on all vehicles and passengers entering the city.

One of the principal objects of the intended "Ringbahn," or Circular Railway, designed by Mr. Joseph Fogarty, M. Inst. C.E. and F.R.I.B.A., of Westminster, being the connexion of all the existing railways, and the transmission of traffic to and from the heart of the city to all parts of the Austrian Empire, the construction of a large central station became a vital necessity in the scheme; but to find a site for such an extensive building in the proper quarter was a task surrounded with difficulties. After much consideration, the solution of the problem was discovered in the idea of erecting a building in such form that only a small portion of the space on the ground-floor level would be required for the purposes of the railway traffic: that is, for booking-offices, customs and police bureaux, and for the reception and transmission of passengers and their luggage. These are concentrated in a central block, about 70 metres square, containing a central hall, 44 metres by

33 metres, from which the platforms overhead are reached by lateral staircases, external access to the principal approaches being provided at both sides.

The station proper, which is to be about 250 metres long by 55 metres in width, under cover, is therefore altogether on the upper floor, and contains ample provision at the sides for the offices of the officials, refreshment and waiting rooms, telegraphs and porters, &c., with special apartments, as usual in Austria, for the Imperial family and the guests of royalty.

Carriages and luggage are to be raised to the level of the platforms from the street level by numerous hydraulic lifts.

The remaining covered areas of the ground-floor, forming very extensive blocks, are to be surrendered to the municipality for public purposes, such as a fruit and flower market on the left, and a kinder-garten, or children's playground, on the right. There is also a space reserved for a fish-market, for the Danube Salvage Association's warehouses, and other useful municipal institutions, hitherto occupying ground on the bank of the Danube Canal, which is in reality a branch of the Danube flowing through Vienna.

The new quay to be formed in front of the station, on this canal, will enable ready interchange of traffic to be made with the steam navigation on the river, which is very great during the summer months.

The total length of the elevated station from the points where the sidings commence to leave the normal iron viaduct, is about 2,000 ft., and of this a middle length of about 1,000 ft. will be occupied by platforms, thus forming a double-ended station from which the longest trains made up in Austria can be despatched in opposite directions, the limitation in width necessitated by the site being thus overcome by the fact that the Central Station is situated on a circle. Hydraulic traversers will be fixed at each end of the station for the interchange of carriages from one line of rails to another.

Three double lines of rail and a single central "relief-line" are proposed, giving a total length of about 6,000 ft. of available platform, which is greater than that of any of our metropolitan stations.

The sides of the platforms will be formed in panels containing reflecting-lens lights to illuminate the covered areas and the booking-offices beneath, and the spaces between the alleys in the fan-shaped approaches at the ends of the station are to be in general left open to allow light and air to be transmitted to the ornamental shrubberies of the public gardens beneath so as to deprive the city of as little as possible of its highly valued recreation-grounds. In this way the objections to the occupation of part of the Central Park will be greatly mitigated, if not altogether removed.

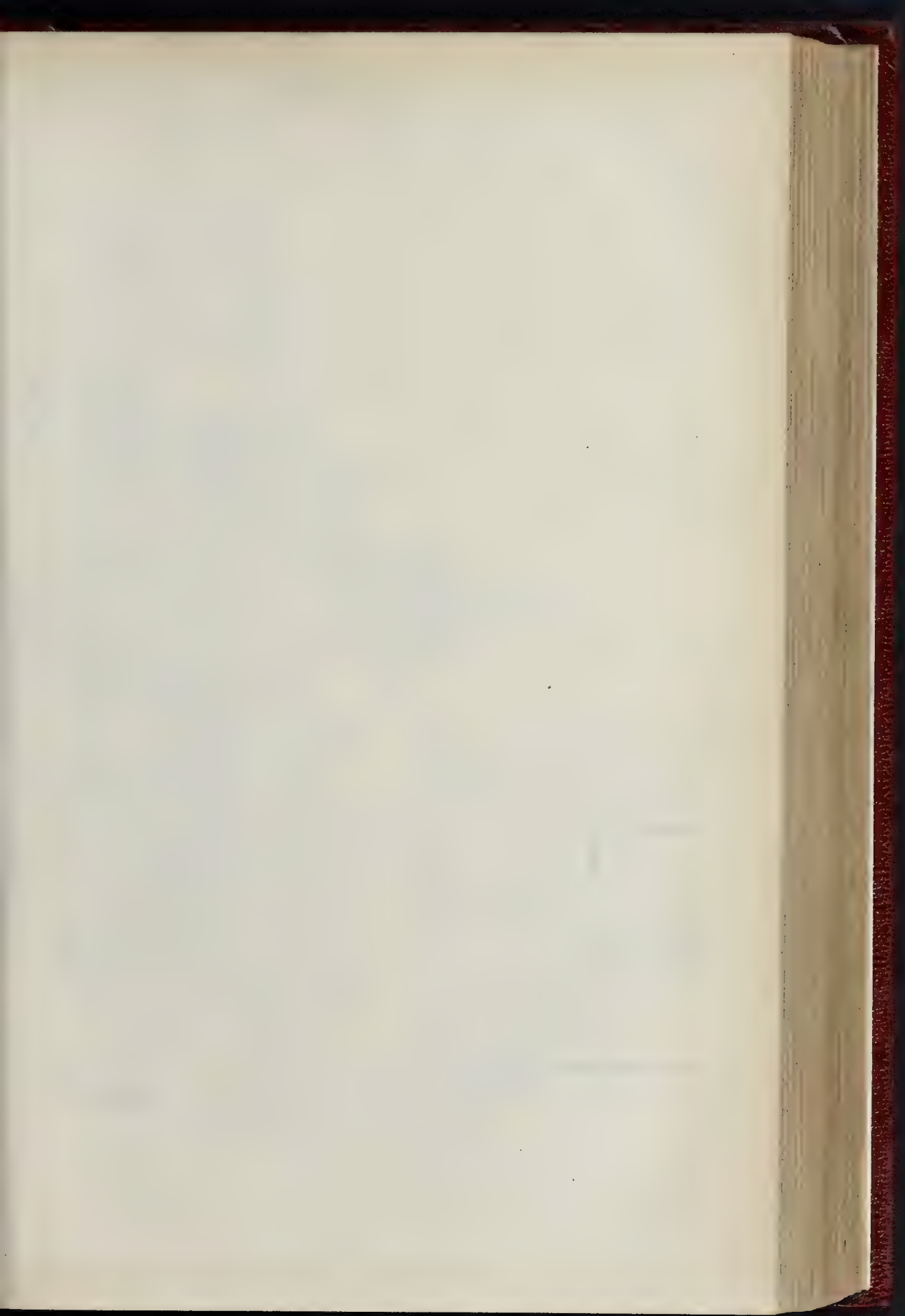
As it is proposed to work the railway with fireless locomotives, on the Lamme and Franco system in use at Lille and near Paris, no danger from ashes will arise in this form of construction, which it is intended to adopt largely in the general structure of the elevated viaducts of the Circular Railway and branches. At the same time, it is believed that electricity will ultimately become the chief motor in this novel system of city railways, the total length of which is about eighteen miles.

The building of the Central Station will be chiefly constructed of iron, the contract for which must be let, under the terms of the concession, to an Austrian firm. That for the Ring Railway itself, involving 70,000 tons of wrought and cast iron, has already been let provisionally to the Witkowitz Iron Company, owned by Messrs. Rothechild & Guttman, of Vienna.

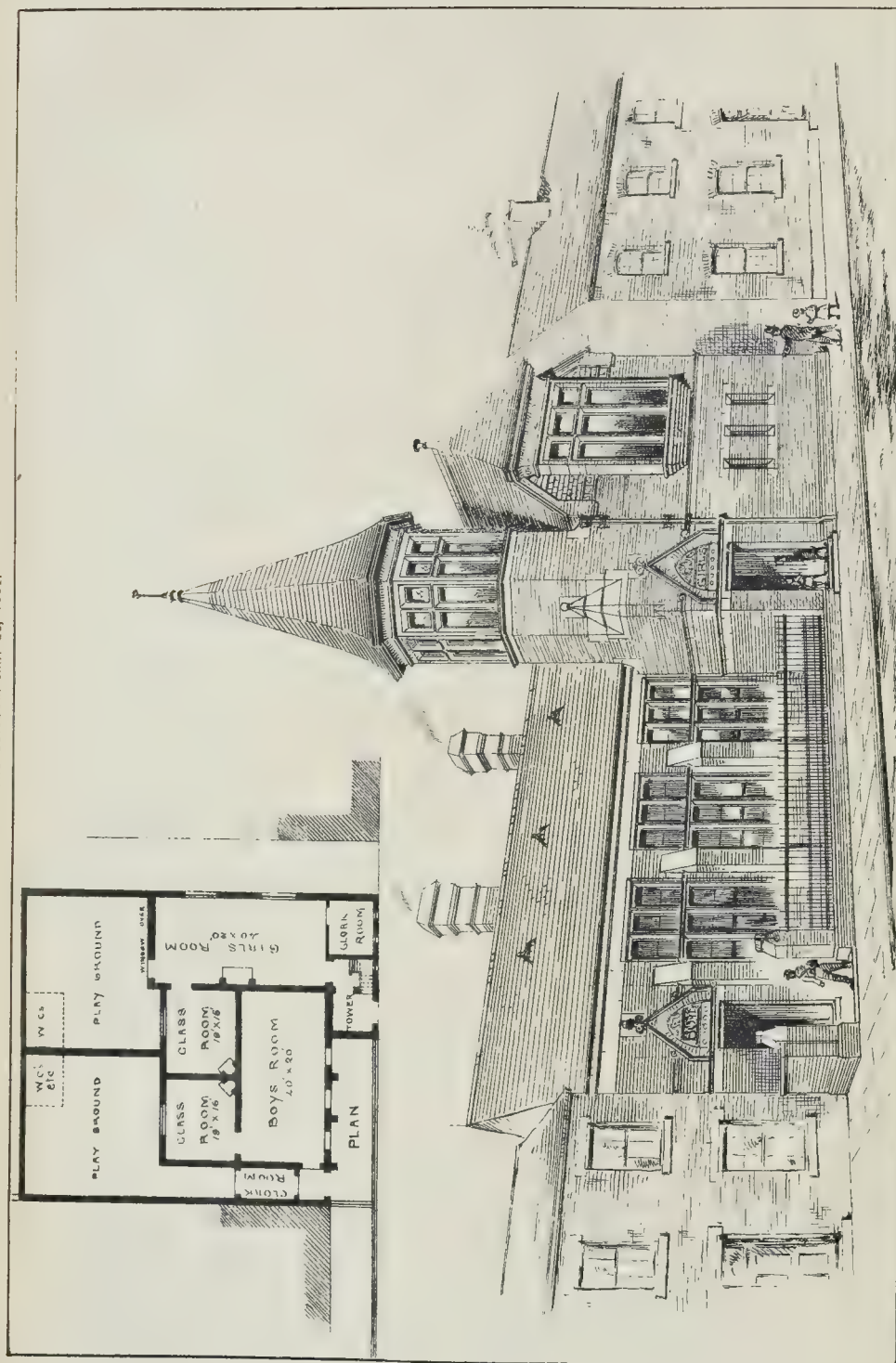
Messrs. Ransomes & Rapier, of Ipswich, and the Anderton Foundry Company, of Glasgow, are the general contractors to the English syndicate who have initiated this great undertaking, which involves a total expenditure of about 4,000,000l., yet, nevertheless, it is believed it will be executed at less than half the cost per mile of the London Metropolitan Railway, the overhead system of construction, at the present low price of iron, being not only cheaper than brick tunnel, but the saving in land and compensation is very great.

Mr. Fogarty has been assisted in the preparation of the designs for the Central Station and other important structures of this railway by Mr. Charles Henry Driver, F.R.I.B.A., of Westminster, from whose drawing our illustration has been produced.

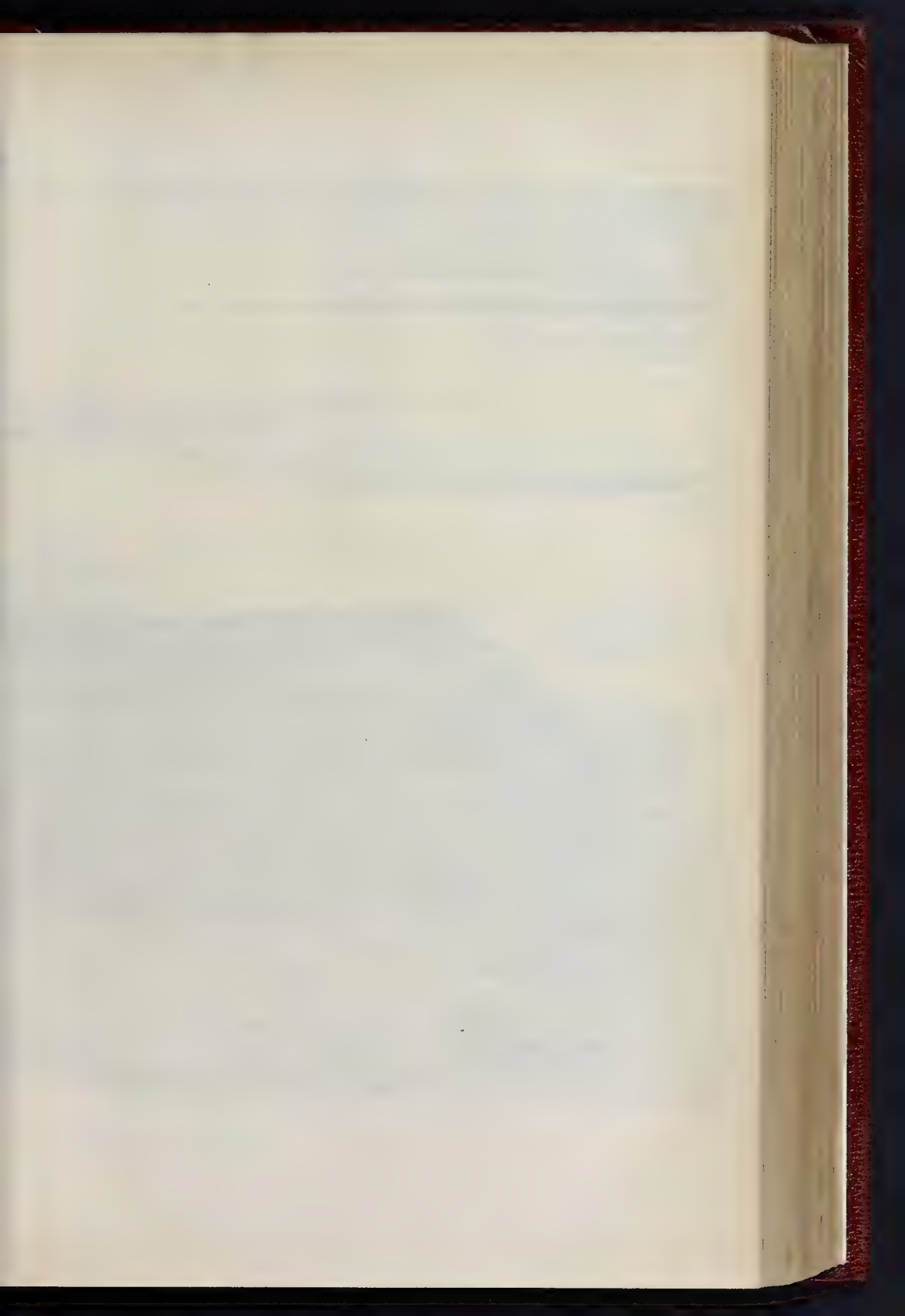


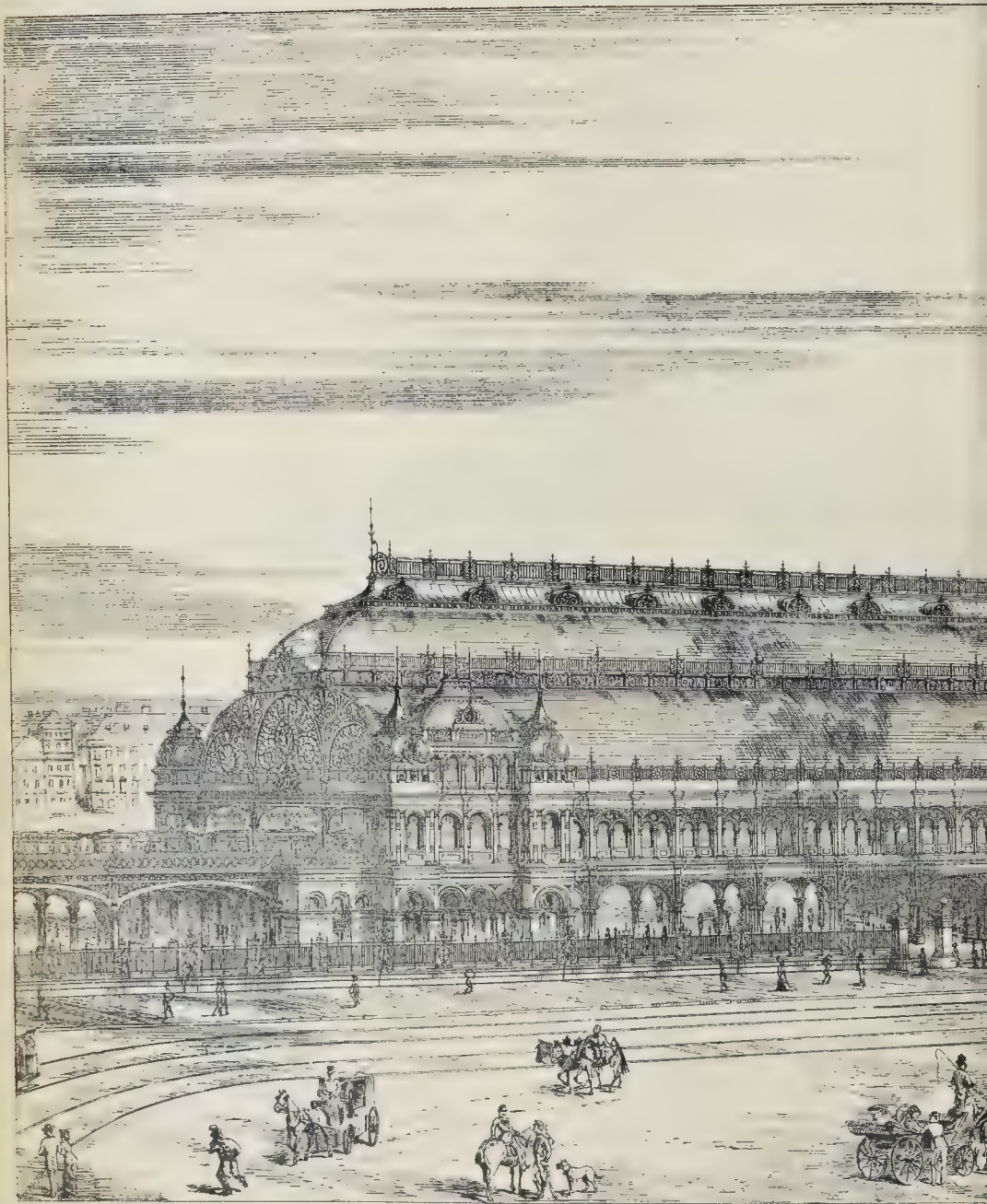


THE BUILDER. JAN. 28, 1882.









VIENNA CITY RAILWAYS: DESIGN FOR CE

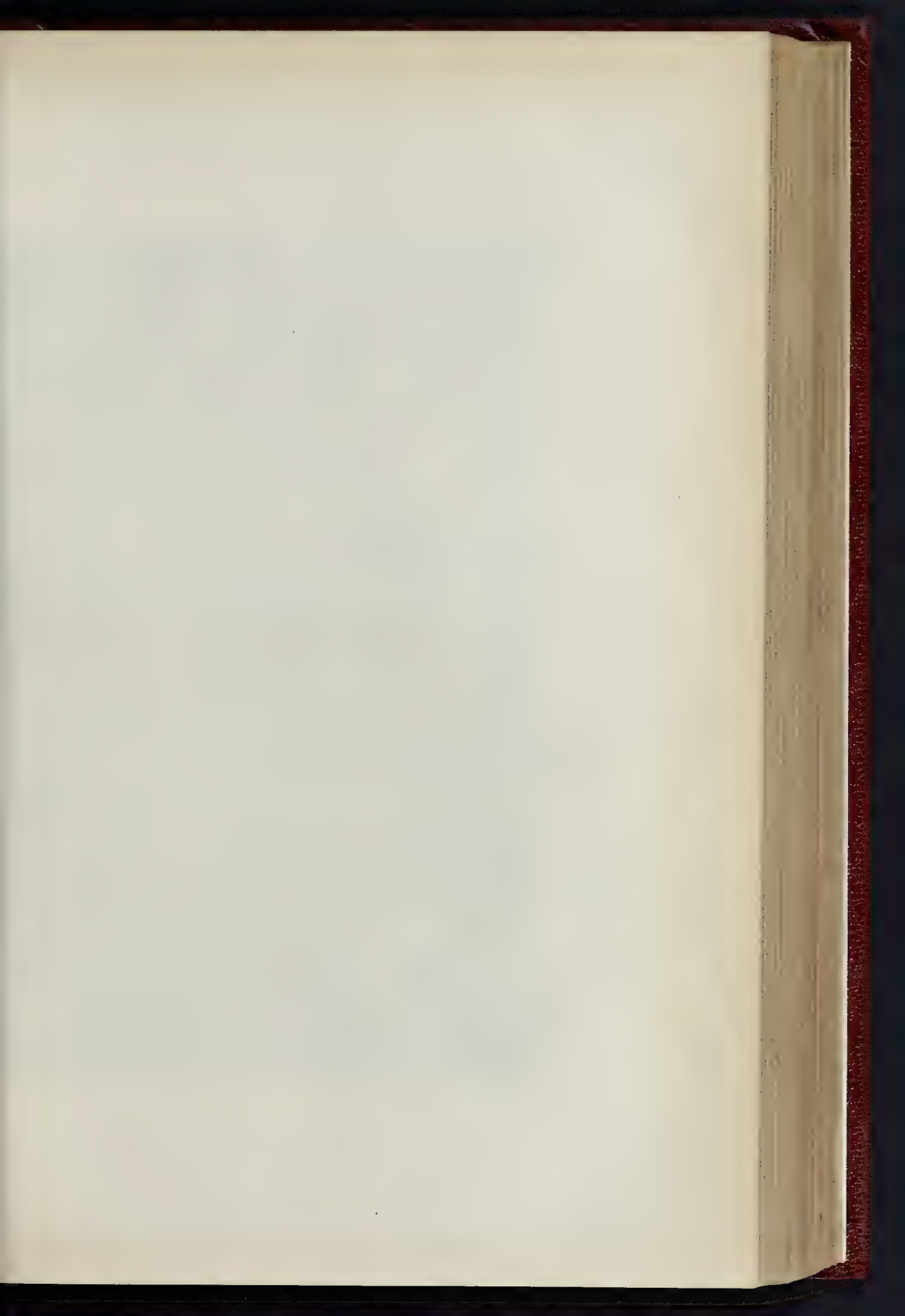




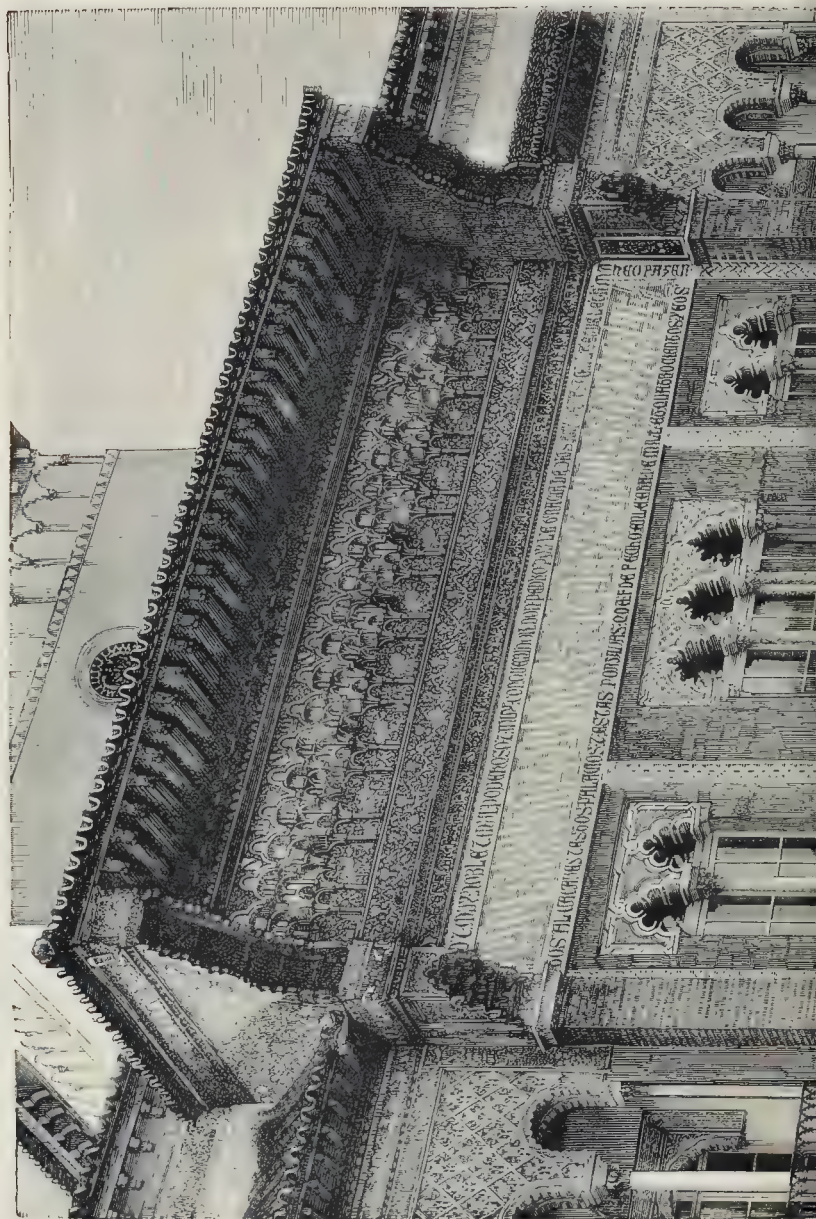
ATION.—MR. JOSEPH FOGERTY, C.E., ARCHITECT.



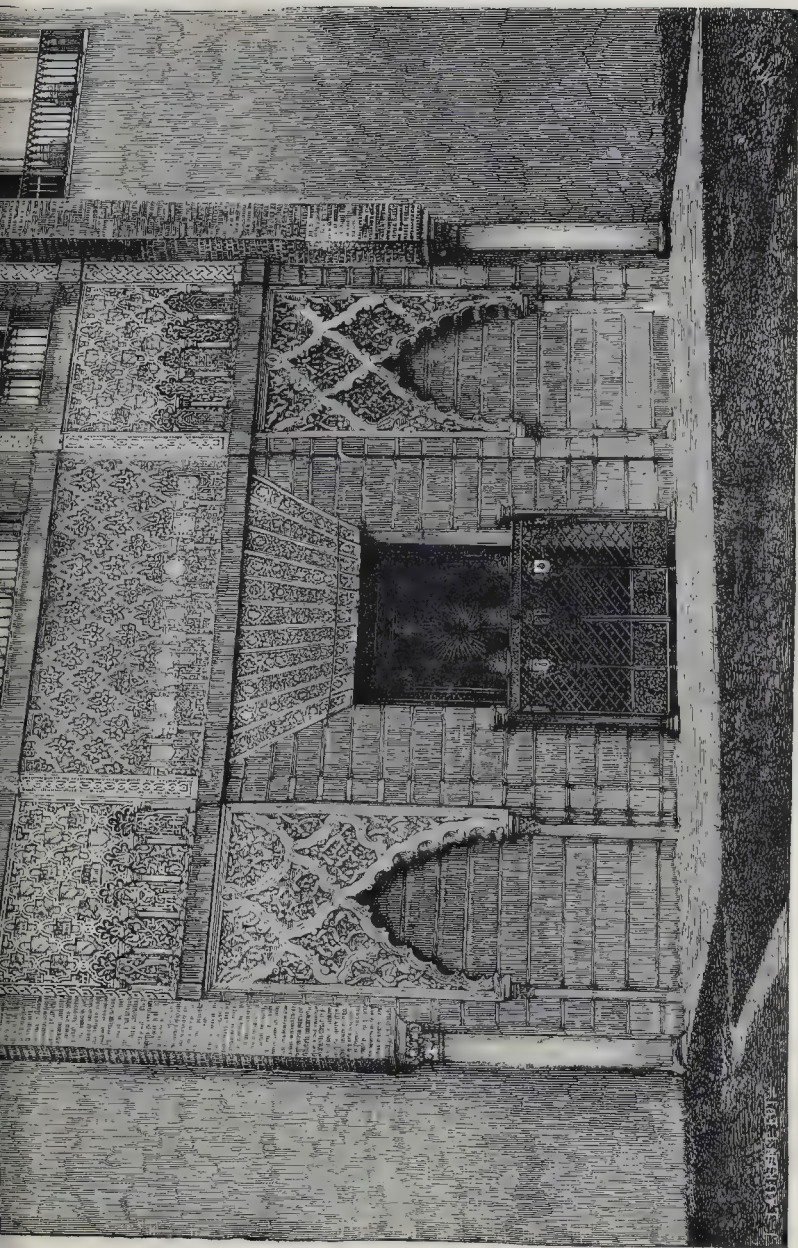




THE BUILDER JAN. 29, 1882.







THE PALACE OF THE KING DON PEDRO, AT SEVILLE: PRINCIPAL FAÇADE.

A.D. 1412.







Whitehead & Sons, London

Wm. & Sons, London

RAISED FLOCK PAPER.—DESIGNED BY MR. G. C. HAITE.





## ARCHITECTURAL INCONSISTENCIES.

THIS was the title of a paper read before the Architectural Association on the 20th inst. by Mr. Philip E. Massey. After a few words of commendation for the useful work done by the Association, the author proceeded to strongly condemn the practice of architects taking premiums for imparting the art and mystery of their profession, and neglecting to do so. Such were, he said, morally guilty of obtaining money by false pretences. In the course of his remarks on this subject he suggested that on the occasion of the examinations and awards of medals at the Association and at the Institute, it should be stated to whom the successful students had been articulated. He then proceeded:—Masters in this way may get to take an interest in the advancement and successes of their pupils, and so endeavour to push them on as reflecting honour on themselves; and certainly those who do this are fairly entitled to the credit of it. And if architects did thus their duty, the benefits of this Association, having attained such a high position of usefulness, would not be lessened, but increased, having so much the better material to deal with. I hope for and expect a grand career for the Association. I should expect in time it will be affiliated to the Institute, the members having access to the lectures and library thereby, and that also they will be free to the libraries and have sketching privileges at the South Kensington and British Museums, and have free admission to all the art exhibitions of the metropolis. What I have said so far is really only a preliminary to my subject, though I think the evil pointed out may be truly considered as one of inconsistency, and a very serious one too.

The architects of old were unquestionably practical men, consequently their work for the most part is equally distinguished for taste and judgment, beauty and constructive consistency; and were it possible now for the architectural student to take a turn of work in the joiner's shop, in the mason's yard, and at the forge of the smith, he would, I think, make a better architect. Certainly, the more the pupil sees of these trades the less likely will he be to commit practical inconsistencies. As it is, such abound. I have often been struck with the inconsistent use, in modern work, of barge-boards. In old time, you know, they were used to stop the horizontal timbers of the roof. It was an ornamental way of dealing with the outside rafter. But these boards were only used to wooden buildings, and thereto because the purlins, plates, &c., required a good bearing to sail over the external framing, and doubtless, too, it was seen that a good projection of roof would assist to make the house, whose walls were comparatively thin, dry and comfortable. The necessity did not occur in brick or stone construction, the usual thickness of wall there giving good bearing and defence: consequently the Medieval builders never put barge-boards to such buildings. Now, however, I see them without any propriety of distinction, and the old idea is so far lost sight of that probably the board, instead of stopping the actual roof timbers, has special supports for it! Indeed, the old intention has been so far lost sight of that I have seen an imitation barge-board on the face of a building carved in stone, and in another case the boards placed on top of the slates! The hip-knob, too, which requires to be but little longer than is sufficient to receive the end of the board, and which rarely in old work rises above the roof, is now ridiculously elongated to perhaps 10 ft. or 15 ft.,—exaggerated for vulgar show.

Wooden-framed houses are now in fashion. To be consistent with old examples and real requirements, they should be of solid and substantial construction. But in what a dainty makeshift way the modern work is done! Halved uprights; angles in two pieces; thin joists (which have to be cased for appearance sake when they come into view); sham blocks inserted to look like beams; no substantial tie, but the sides held together by straps and coach-screws! I pity those who live in such houses. Draughty and leaky they must be, and colds, rheumatism, and, it may be, consumption, are a heavy price to pay for this made-up picturesque. This construction is often resorted to for the sake of cheapness, but if properly solid, it would be as expensive as brick or stone.

I know but of one modern addition to the ornamental (if it be such) resources of the carpenter's art, and a miserable thing, in my opinion, it is. I refer to V-jointing; I protest

against it. The reason assigned in excuse for this vulgarity, that it hides shrinkage, is insufficient. It does not do so, but makes it really more manifest, and besides, there ought not to be shrinkage. To so make a defect in order to hide a defect is about as reasonable as a man with a new coat thinking that as in time it would get threadbare and rent, he had therefore better at once make false rents and put on threadbare patches so that the real deterioration from time to time might not be seen! In modern Classical buildings panelling boards fit without gaping, why not in Gothic? The carpenter, of course, approves of the thing, because it extenuates the use of unseasoned material. The small architect, too, likes it (especially the chapel architect), because it makes a show of design without cost. The inconsistency of the thing is shown in that although oak is the most difficult wood to obtain seasoned and unshrinking, yet the practice is to except this wood from the spoiling chamber, and to leave the joint square.

In wooden roofs of Gothic churches there is often perpetrated the glaring inconsistency of putting a Perpendicular hammer-beam roof on a building designed in an earlier style. The Irvingite church in Gordon-square is an example of this perverse, unreasonable treatment, and there are many others. Whatever style is chosen, it should be carried through. To the eyes of taste such incongruous anachronisms are most offensive. Some would-be superior men, too, will make the chance of a new church of a different date to the nave, or, beginning at the west end, will gradually work down to a later period, increasing in ornament to the east. These are utter frivolities. Also, if a wooden roof is used, it should be constructed of wood entirely. It can be done, and common sense and consistency require it. It is, however, a common practice to use, for the purpose of tying the roof together, wrought-iron rods, with a miserable attempt at disguise as if part of the gaswork. If walls be substantially thick a foot-tie to the principals is not needed. If the walls are slim and weak (too generally the case) there is no reason why the tie should not be of wood. The ancients were not ashamed of a foot-tie showing for what it really was. Why should we be? The fear in this respect is as absurd as the horror I remember there used to be in the Classical time lest a chimney should show on the roof. Old French examples can well be followed as precedents for foot-ties.

In the re-introduction of Gothic for domestic purposes, one of the greatest difficulties has been in the windows, to adapt the mullioned window to modern needs. Instead of meeting the difficulty boldly with fitting and appropriate treatment, architects generally have attempted a compromise, and, as in such inconsistent attempts generally, have failed. As the little lattice of olden time did not meet modern requirements, a bungling conjunction of sliding sashes behind stone mullions and transoms has been the usual thing done, and it is as bad as bad can be. In expensive buildings, hinged gun-metal casements and gun-metal rising sashes with springs, have in some cases been adopted, but these are very expensive, and do not give much air, though neat. Such devices are not for common use. For our eccentric climate, with its preponderance of wet, and subject to such rapid changes, I hold that there is nothing comparable in comfort and convenience to the common lifting-sash. For more equable climates, no doubt, the French casement is as good or better. Now, I would warn the young architect not to go over the ground on which so many have stumbled, but to admit the necessity of the sash, with its bothering boxings, and to design the stonework accordingly. As a general rule, the more stable materials should over-rule that which is less so, but this is an exception. But what becomes of the mullions and transoms? say you. Well, you must do without them. Instead of a broad mullion-divided window, put two or three moderately wide but independent window-openings side by side, and though the light apertures be square or only slightly arched, yet, following French and German examples, arch-heads can be put over. This is done by some, and the sooner that the clumsy practice first in vogue is given up the better. The Medieval architecture of this country has many and special beauties of its own, but in one or two particulars foreign work has peculiarities which may well be engrafted on our own style; and with respect to windows, I recommend the projecting sill with a drip

under splay. It is very unsightly, in towns especially, to see the dirt-stains down the wall,—washings from the window-sills. I have seen an example of projecting sill done by the elder Pugin, and wonder it has not become general. The projecting balcony, never seen in our old work, though common abroad, is also worth importing.

The present craze for subdividing the window sash into small squares with thick bars is inconsistency with a vengeance. The purpose of a window is to give light inwards and view outwards, and the more perfectly a window does this the better; and in effecting this double purpose we have in the present day the great advantage of glass in large sheets, than which nothing is more handsome or more perfect. Yet, for the sake of novelty and restless love of change, people go back to the imperfections of old date. To be consistent they should also take to tallow candles and rush-lights, eat off pewter, use steel forks, &c. It is a less objectionable fashion, whilst having large-sized glass panes below, to have the upper parts of Gothic windows glazed ornamentally with leaded lights. I see not why the ornamental pierced leadwork which was at one time used should not be reintroduced.

A peculiarity of old stonework, almost without exception, is the circumstance of having a joint through the apex of the arch. This should be your practice, as it saves labour and facilitates setting. Yet I often see in modern work this wholesome rule disregarded, from ignorance, I suppose. In the so-called "restoration" of the crypt of St. Stephen's Chapel, Westminster, is an example of this mistake; and another bad departure from the old rule I saw there, the label being worked on the arch-stones of the window-heads, which the old masons never did, it being wasteful of time and material. A great beauty in old work is its unostentatiousness, the absence of all personal vanity in its designers, and it is the predominating evidence of vanity and love of vulgar display which makes much modern work perfectly nauseous. This sin is most besetting in those who design Nonconformist chapels, in which the effort is constantly visible of attempting to make a show and grand display, the means being miserably insufficient. Why cannot a chapel consistently be a chapel instead of shamming to be a church? If a one-span roof is a positive requirement, the building should honestly show outside that this is the case, and not be notched-back on its apron-faced show-front to mimic a nave and aisles. This is rank burlesque in architecture, yet it is constantly being done. The towers and spires of these chapel architects are grossly inconsistent when one notices how slight are the walls, and how thin and mean-looking the woodwork always is. Scottish church architecture, by the way, is very similar to this. The only good Nonconformist chapel I have ever seen (and that because it is at variance with chapel notions of architecture) is one by no less a person than Mr. Butterfield, at Bristol. It has real nave and aisles, and, you may be sure, with good stone piers and arcades, instead of chapel-like cast-iron pipes. This building is quiet and respectable-looking. I think it may be worth mentioning, in respect of this example, an oversight in the omission of a damp-proof course. This has been since added by a patient local builder, who cut out at ground level a hole through the wall (rubble stone), a yard at a time, and so inserted round the building the needed adjunct, and this without any injury to the superstructure. A chapel architect who shall be content with consistent simplicity of design, preferring sound construction to weak display; designing according to requirements, and not attempting to pass it for something else, is a man much wanted, and who has yet to appear. The one-side show-front is a bad chapel characteristic, with its over-traced windows, its over-blown cabbage carving, its niches and noiches, chamfers and splays, bristling with points and angles, and with flanks, it may be, and coarse brickwork. At one time this sort of thing was done by church architects, as at Camberwell and Hanwell by the late Sir Gilbert Scott, but better taste and judgment now ordinarily rule. The stern realities of Butterfield and Brooks are a gratifying exposition of true principles, which Nonconformists should study and imitate.

Over-big capitals with ponderous carving are a very general fault with second-rate architects, and with the capital copied from one church and the arch from another their arcades are



often inconsistent. The square abacus of Early French, now much affected, is absurd if used with a playd arch. I see this done, however.

Architects very inconsistently copy the arrangement of old churches, though at variance with convenience and propriety, in the matter of chancel aisles. These, in old work, were mortuary chapels, fitted for service, with altar, &c., but are now imitated for organ-chamber and vestry purposes, for which they are unadapted. Of late, in closer imitation of the Roman Catholic Lady Chapel, a so-called "morning chapel" is formed, but it is unnecessary. This reminds one of the old lady who had a large hole cut in the bottom of her yard-door for the big dog to enter, and a small hole for the little dog. An organ-chamber should be an organ-chamber, and a vestry a vestry. The first will require greater height than the aisle usually affords, and the vestry, instead of open arches, should have closed sides. The merely screened-in vestry, though it satisfies architectural vanity, is an inconsistency and an abomination, from its lack of privacy. You probably know the story of the country parson, accustomed to stone walls, going to preach in a strange church, and thoughtlessly, when robing, asking the clerk aloud, in common phraseology, for a useful but vulgar article. Can you imagine his horror when the clerk, by a sign, makes him cognisant of the dreadful fact that only a curtain separates him from the waiting congregation? Such accidents,—and something of the kind, no doubt, has happened,—ought not to be possible.

Two important additions, of great beauty and importance, were made to the stock features of Classical architecture by the Renaissance architects, viz., the rustication of angles, and new forms of rustication, and the balustrade. Rustication expresses massive solidity and strength, and therefore should be used in the lower part of a building; yet, with utter inconsistency, in the Art Union offices in the Strand you will see that the first-floor story is rusticated and the ground-floor not. It gives one the idea of the floors having been transposed. If it was a strong point with the designer to have his first-floor so, he should certainly have made the lower one also of a vermiculated or bossed type, so as to appear the stronger of the two. In the Grand Hotel, Charing-cross, you may see inconsistency in the rustication at angles. To be appropriate it should start from the ground, but there, on the ground-floor, are polished granite pilasters, on several stories above is a rusticated quoin, then a panelled pilaster, then rustication again. The rustication should have gone all the way through from the bottom, though it might vary in character. The design of this building generally is much open to criticism. Variety is a good thing, but when, as here, you get too much, the result is wild disorder. Of the balustrade, its common use to windows, to fill up under the sill in place of a panel, is an inconsistency best avoided.

Sacred writers compare men to sheep, and with great propriety. The sheep is the most stupid of all animals, and more particularly in its propensity for senseless imitation; and in this respect men are particularly like sheep, and especially so are architects. As an illustration of what sheep are, I remember a case in the North a few winters ago, when a leading sheep fell into a deep trench, and could not get out. The rest of the flock followed suit, jumping in one on top of another, and were all smothered. So, if a leading architect takes an eccentric "header," into a "Queen Anne" or some other pestiferous pitfall, he is immediately followed by a host of imitators, and there, architecturally, they perish miserably.

Brick is a humble, honest, and trustworthy friend, and, though not lovely in appearance, is a good material for the atmosphere of London. Its use for churches here is, therefore, consistent; but what is to me vexatious is to see the mania of imitation tempting architects to build in brick in country places where stone is available. And so with tiles, &c. In the south-eastern counties in olden times, having no choice, were obliged to use them, and after a few centuries the colour becomes agreeable; but they get used now, though no necessity exists, and though the material is in every respect inferior to slate, because some one architect sets the example, and the ugly things are even imported into slate districts.

In the matter of church doors I beg to give a couple of hints which may be useful. The one

is to mind not to forget to see that the hook-stones are let into the jambs as the work proceeds. These are sometimes forgotten, and the blunder is not to be remedied. The hooks, if merely fixed by the shanks being driven into the joints of stonework, soon loosen, and are an unmitigated nuisance. The other is to mind that the inside arch of the doorway is sufficiently high to allow the door to open. The arch is ruled by thickness of wall. It will not do to judge by look. You must first find the position of the door when open, on the section, in order to get the springing-line. This is a pitfall for many a young architect. If you use strap hinges, see that they are of wrought-iron, and form part of the hanging arrangement. In the use of cast-iron sham hinges the chapel architects are great sinners; and so, even, are some church architects. It is a wonder to me to see these abominations in the illustrated catalogues of good firms. It shows, I fear, that there must be a considerable demand for them.

Stanchion bars to windows are needed as a protection against thieves as well as for support to the glazing. (By-the-by, you seldom see them in chapels.) Be sure you put them on the outside of the windows. I have seen them set inside, and, in consequence, where the hopper casement came a piece of the bar was cut off and attached to the glazing. It looked all right when the casement was closed, but when open, the piece of bar flapped with it. This was a sort of consistent inconsistency.

I see errors committed, as it seems to me, by determining on a thing from its front look only. For instance, in a church I know, the unpractised designer has put detached columns, with corbelled caps and bases, to carry window-labels. In front (though the idea is absurd) the faulness is not seen; sideways, the projection of the cap is seen to be in absurd excess of the requirements. The bulk of anything carried on capitals should fully occupy the area, standing well over. Similarly, at Holloway's shop in Oxford-street,—a thing of very bastard Gothic,—the heavy window-columns support a hollow; and in the refreshment-room at the Brighton Aquarium there are columns, semi-Classical, supporting nothing (by the way, how is it that, as in this Aquarium, and in the shop before mentioned, and in the Langham Hotel, the architects have mixed styles?). The most notable case of this inconsistency between the carrier and the load which I have seen of late is in the Hall at the Natural History Museum. The side-piers have shafts, as for vaulting purposes, running up from the floor, of massive Romanesque character. As the eye ascends to the roof, instead of finding a covering in character, a roof of extreme lightness is seen, the principals being of wrought iron, with pierced ornament. In elevation on drawing the inconsistency would not be obvious, but in execution it strikes one at once. It was a pity, it seems to me, that a terra-cotta arch was not thrown across as a principal at each pier, by which means consistency would have been preserved and a novel and striking effect produced. But if this device was deemed too daring, or iron preferred, the principals had better have been of cast iron, with moulded instead of pierced ribs, and made solid enough to carry out the character of the piers.

In connexion with iron engineering work, this rule requires to be borne in mind: that whereas the engineer designs with a minimum of material, not caring for appearance, architecture of monumental character always requires a surplus of material. There is an adjoining room to the one I have alluded to in which the relative conditions are much happier.

I spoke of the architectural pupil being taught landscape-drawing, the which, to some, may appear unnecessary. I think it quite needed, as every one should be able to make his own perspective drawing, and without a knowledge of the accessories to make a picture the thing is but half done. Now that reproduction by printing is so easy, perspective drawing is coming much into vogue, but though many are able to draw the building well, there is usually a total failure as regards sky, foliage, and figure—and, unhappily, the typo seems to delight in these things in proportion to his inability to depict them properly, and so his drawing is spoiled. Where such positive inability exists, it would be far better to show no sky or trees, or only just a line or two to express cumulus or cirrus, the foliage being merely in outline, and no figures. In order that the pupil may attain something like consistency in his perspective drawing, I will give some general

rules he should be careful to observe. Be mindful that the forms of your clouds, trees, or mountains forming your background do not shape themselves round the features of your building,—a very common defect. Such forms should be as diverse as possible to the architectural lines. Sky or other background should be very delicately done. One sometimes sees a sky so coarsely rendered as to itself become the main object, at the expense of all else. Unless in the case of a cottage or very small structure, trees should never show from behind over the roofs, or the building will be fatally dwarfed. If you want your building to look large, have as little margin for landscape as possible, and no big trees or other large objects in the foreground. A hush is usually made with figures. The artistic rule is to put the figures in the least interesting part of the picture,—a rule which the young architect usually runs counter to. Don't put figures in door-jambs, where they are confused with the columns, or under any strong perpendicular line, which they will seem to carry; and the less perpendicular the figures are the better. No exact rule can be given for arranging these details, as every subject will require its own treatment. It is always necessary, in the general effect, that there should be a balance of parts. The student should practise sketching figures, as, besides the need in respect of perspective, there is great advantage in being able to draw statuary in and about buildings. The generality of architectural drawings are sadly deficient in this particular, and buildings are often totally spoiled by the clumsy carving depicted. There are two theories and methods as regards linear drawing,—the old-fashioned fine line and the modern coarse line styles. The old style, common in my young days, required the line used to be of the finest, and then, on completion, the drawing was "washed" to make the line still finer. This was the extreme in one direction, and the evil of this fine line was that it almost defied tracing. The modern thick line, applauded by the late Mr. Burgess, errs in the opposite extreme, as the delineation of minute detail is impossible with it. A great objection to the new style, I consider, is the prominence given to the jointing. The truth is that consistency requires the line to be fine or thick according to the size and nature of the drawing. Any fixed rule is bad; it is a matter of circumstances. The great mischief of the coarse line is that it excuses carelessness and ignorance: details which ought to be clearly shown are slurred over. London drawing is, as a rule, I consider, inferior to that done in country offices (I speak of London-bred pupils), and English drawing is inferior to French or German. Good drawing is a matter of great importance, as it is pretty certain that a good draughtsman will make a good architect, for the greater facility he has in expressing his ideas, the more active a man is likely to be in exercising his mind. Certain it is that he who is at the head of the profession at the present time, the most successful architect of the day (Mr. Waterhouse), is also the most accomplished artist. But, though draughtsmanship goes far to make an architect, yet to be a successful architect good business qualities are required as well.

In bringing these cursory remarks to a close I desire you to remember that I address only the younger members. I do not affect to have made any new discovery either in construction or design. I simply wish to inculcate thoroughness, and the need, in general design, of studiously avoiding anything for which a common-sense reason cannot be given, and, in regard to details, to habitually "look round" them, so to speak. Whether working in the Classical, Gothic, or Renaissance styles, the pupil should go to old work as his only consistent guide, and so, in the words of our great poet,—

"Instructed by the antiquary times  
He must, he is, he cannot but be wise."

[We defer our report of the discussion that ensued.]

**Shrewsbury School of Art.**—On Saturday, the 21st of January, Sir Baldwin Leighton, bart., M.P., distributed the prizes to the successful students, and gave a short address. The prizes, numbering about twenty, included a National Bronze Medal (awarded to Miss Edgell for a design for a mirror frame), and four third-grade prizes. The school is said to be in a sound financial position, though it does not meet with much support outside.



SUPERVISION OF PUBLIC BUILDINGS  
ABROAD.

At Munich the authorities have issued a regulation requiring that in future the plans of every proposed new building, designed to accommodate large numbers of people together in one apartment, shall be submitted to the Municipal Authorities and to the President of Police before permission is granted for the erection of the structure. The object is that the two authorities above mentioned may satisfy themselves as to the adequacy of the arrangements of every new hall, theatre, &c., to avoid danger from fire, and secure the safety of the audience against peril from fire and panic.

## OBITUARY.

*Mr. Allan McCall, Architect.*—On the 18th, in presence of the Mayor and a large number of spectators, the mortal remains of Mr. Adam McCall, the leader of the Livingstone Mission on the River Congo, were consigned to the grave in Leicester Cemetery. The son of Dumfriesshire parents, an architect and surveyor by profession, he had during the seven years from 1872 to 1878, inclusive, according to the *Telegraph*, travelled between 15,000 and 20,000 miles in South and South Central Africa. He visited Cape Colony, the Orange Free State, Griqualand West, Natal, the Transvaal, Bechuanaland, the Matabele Country, the Zambesi Valley, the celebrated Victoria Falls, and the Upper Waters of the Zambesi, some 2,000 miles inland from Cape Town. During the last two years of his life there he traversed regions almost untrodden by white men, and for twelve months did not even receive a letter. Two years ago he left England for the purpose of leading an expedition up to Stanley Pool, on the Upper Congo, accompanied by four young men, all thoroughly fitted for pioneer work. Six missionaries had preceded them. It was almost within view of the realisation of his desires that Mr. McCall was stricken down by illness. He left for England, and died when he reached Madeira.

*Mr. John Linnell*, the painter, died on the 20th inst. at his residence at Redhill, Surrey. Notwithstanding his advanced age, and the fact that he would not suffer himself to be elected a member of the Royal Academy, his pictures were to be seen on the walls at Burlington House down to the most recent exhibitions. In last year's exhibition there he had one picture, the "Woodcutter," No. 177 in the catalogue. Mr. Linnell, who was born in London in June, 1792, painted in oil as early as 1804, and was, about 1805, a pupil of John Varley, the father of the existing school of water-colour painting. He first exhibited at the Academy in 1807, "Fishermen, a Scene from Nature." He obtained a medal at the Royal Academy in that year for a drawing from the life, and another in 1810 for the best model from the life, and the prize of fifty guineas at the British Institution for the best landscape in 1809. He exhibited at the Academy again in 1821, landscape and portraits.

*Mr. Wm. Miller*, the well-known line engraver, who for more than half a century was employed, with great success, in translating into black and white many of the designs of our greater English painters, and especially of Turner, died on the 20th inst., while on a visit to Sheffield. He was in his eighty-sixth year. A little of his work was done before the year 1830, for the "Southern Coast" of Turner; and shortly afterwards, Turner highly appreciating his labours, Miller was engaged upon the illustrations to the "Prose Works of Sir Walter Scott," and in 1834 upon that edition of "Rogers's Poems" which the collector seeks for by reason of the Turner designs.

**The Newton Abbot School of Science and Art.**—The new session is being opened with some vigour. The committee desire to encourage and develop, as opportunity and occasion admit, the decoration of pottery, for which the neighbourhood offers special facilities, in the hope that this may become the speciality of the Newton Abbot School of Art. During the last session day classes were held twice weekly under Mr. A. Fisher, of Torquay, with an attendance of twenty students, who worked in both under-glaze and over-glaze colours on pottery, and many of the works produced won medals of merit and prizes in numerous exhibitions during the past summer, in both London and the provinces.

THE CHAMBERS AND OFFICES  
COMPANY.

We are a slow people to adopt changes, more especially in our social habits. Gradually, hand-some blocks of buildings have been erected in the metropolis which contain within themselves many separate dwellings, familiarly known as flats. They have the advantages of private houses, are more economic by reason of their compactness, and are far less costly to keep up. The contingent expenses attendant upon the occupancy of a separate dwelling-house, such as the periodical renovation of the outside, the drains, lighting, warming, water services, insurance, and so forth, are considerable; whereas, when these charges are divisible, as in the case of joint occupation of the same building, they are then comparatively unimportant. With all this, the public have been somewhat tardy to profit by living in flats. It may have been their hesitated to make a change from the established rule of dwelling in separate houses, or were apprehensive of inconveniences. Notwithstanding, the time has now come when, to a considerable extent, it is the custom to live in flats, as in Paris and other Continental cities. Difficulties have hitherto been found in disposing of them separately, if occupied as private dwellings or as offices, from the fact that, previously to special legislation, a freehold interest in separate chambers and offices might have been created, but it was found impracticable to deal with such an interest, for the want of some convenient organisation by which the rights common to occupiers could be managed, and the cost of re-building in case of fire might be recovered. This is now provided for by a private Act of Parliament passed last session incorporating the Chambers and Offices Company. This Act facilitates the management of blocks of buildings and the disposal of each separate tenement, and gives power to the company, as a single controlling authority over buildings constructed for occupation as separate tenements, to levy contributions, defray general expenses, and for the management of all parts of a building common to all tenements, thus securing to purchasers their individual rights. The advantages to be derived from this Act will also apply to industrial dwellings, and it is desirable that artisans and others should avail themselves of its benefits to secure long leasehold or freehold homes of their own. The Chambers and Offices Company have an influential Board of directors; their offices are at 21, Cannon-street, City.

## MILFORD DOCKS RAILWAY AND PIER.

ATTENTION has been directed within the last few days to the progress of the important works at Milford Haven, the effect of the completion of which on our maritime trade it is not easy to anticipate. There is not, however, very much to add to the recent notice of the new docks which has appeared in our columns. The wet dock covers 40 acres, and the graving-dock is the largest in the United Kingdom, being 815 ft. long, 99 ft. wide, and with a sill 36 ft. below the high-water level of an ordinary spring tide. There are two entrances to the docks, which is a very great advantage for the craft that will resort to it. Upwards of 2,250 yards of quays are now complete. A pier, 760 ft. long by 23 ft. wide, has been constructed to the east of the town of Old Milford, with 23 ft. of water alongside at low-water spring tide. This pier is connected with the South Wales Railway. Intimate knowledge of the locality leads us to anticipate very full traffic as likely to be attracted to this port, when the works in progress are completed. Its natural advantages are, taken all in all, without rival in the island, and when a vessel has left the entrance of the harbour she is not only alone in the open sea, but in the very centre of the maritime range of the whole world. That the American trade is likely to concentrate itself on Milford, when the accommodation in progress is complete, there are good reasons for anticipating.

The constructive feature which strikes us as the most novel is that the caissons, which close the opening of the docks, are made to traverse beneath rollers mounted in masonry, against which they are pressed by the water. We have not been favoured with a drawing of the caissons, so that we must reserve our comments as to the details. But the reversal of the ordinary mode of traverse, under the condition of the upward instead of the downward pressure caused by gravitation, strikes us as both ingenious and

extremely suggestive. We have long been aware of the advantage of suspending large gates for yards, workshops, or engine-houses, and making the rollers which bear their weight run on an iron bar overhead. The constant injury done by stones and dirt to a set of bearing wheels and rail is thus avoided. In this plan, of course, the weight of the gate is the same, whether it be borne from above or from below. The enormous weight of a large dock-gate is neutralised by making it hollow. It is at the command of the engineer to make the caisson either slightly lighter or slightly heavier than its bulk of water. By adopting the former proportion the pressure is made to act upwards instead of downwards, and we conceive that the greater accessibility thus secured for the parts liable to friction will prove a practical advantage.

The rivalet which descends from Milford "pill" will supply enough water to make up for loss by lockage. The water in the haven and its affluents is so pure and free from suspended matter that dredging is unknown in the haven, and it is anticipated that an expense, which sometimes amounts to as much as 200l. per acre of dock per annum, will thus be entirely avoided at Milford. It is impossible, now that maritime commerce is seeking the most seaward points accessible by railway, instead of the most inland points accessible by river, that Milford can fail of a brilliant future.

## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

188. J. Parrott, Wallington. Warming and ventilating apparatus. Jan. 13, 1882.
199. J. F. Hoyle, London, and G. B. Lovedee, Birmingham. Stoves, &c. Jan. 14, 1882.
209. T. R. Shelby, Smethwick. Glazing greenhouses, roofs of railway stations, &c. Jan. 14, 1882.
225. W. R. Lake, London. Lighting apparatus. (Com. by J. S. Williams, Rivoton, U.S.A.) Jan. 16, 1882.
237. M. Delmard, Plannstead. Window-sash fastener. Jan. 17, 1882.
258. E. G. Greig, Dalton. Stoves for heating and ventilating. (Com. by the Detroit Stove Works Co., Detroit, U.S.A.) Jan. 18, 1882.
261. E. L. Voico, London. Ornamentation of wall surfaces and ceilings. Jan. 19, 1882.
265. J. Westley, Chorley. Rollers and fittings for blinds, &c. Jan. 19, 1882.
276. T. Rowan, London. Ventilating water-closets, urinals, &c. Jan. 19, 1882.
283. A. M. Clark, London. Making trenches for drain-pipes. (Com. by Mr. M. E. Pidgeon, Sangerties, U.S.A.) Jan. 19, 1882.

## NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

- Jan. 17, 1882.
- 3,972. S. C. Davidson, Belfast. Stoves or heating apparatus. Sept. 14, 1881.
- 4,055. W. White, Abbeystead. Building damp-proof walls, &c. Sept. 21, 1881.
- 4,085. C. H. Murray, London. Moulding clay for making bricks, tiles, &c. Sept. 22, 1881.
- 4,151. W. P. Thompson, London. Fireplaces and grates, &c. (Com. by J. M. Cook, Cincinnati, U.S.A.) Sept. 27, 1881.
136. J. A. Slater and M. M. Brophy, London. Gas cooking-apparatus. Jan. 10, 1882.

## Jan. 20, 1882.

- 3,961. R. H. Reeves, Parkhurst. Construction of drainage, &c. Sept. 14, 1881.
- 4,010. J. Inray, London. Cooking-stoves. (Com. by La Société des Spécialités Mécaniques Réunies, Paris.) Sept. 17, 1881.
- 4,803. W. Richards, Norwood. Apparatus for measuring water. Sept. 22, 1881.
- 4,620. H. T. Dawson, Chiswick. Cistern-valves. Oct. 21, 1881.
- 4,662. E. P. Alexander, London. Apparatus for heating baths, greenhouses, &c. (Com. by C. Martin, Paris.) Oct. 25, 1881.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending January 21, 1882.

- 4,121. W. Maovite, Birmingham. Attaching and adjusting door-knobs to their spindles.

A square spindle is used with a trough on one side, in which is placed a spring with a tooth on its free end. This tooth engages a cross slot in the knob when it is passed on the spindle. (*Pro. Soc.*) Oct. 11, 1880. Price 2d.

\* Compiled by Hart & Co., patent agents, 29, New Bridge-street, E.C.



2,442. J. L. Corbett and W. Lookhead, Glasgow. Taps or valves for regulating and controlling the supply of water, &c.

The supply of water is here regulated by a piston, which traverses a cylinder through which the water passes. These pistons close against seats to cut off the supply by the pressure of the water behind, and are opened by levers. June 3, 1881. Price 8d.

2,515. A. Pullan and J. R. Meiské, London. Taps or valves.

This invention consists in the use of a liner or seating, on which the valves work by expansion, contraction, or pressure, and is applied in a variety of different ways, which are described in twenty-one pages of specification, illustrated by 114 figures in the drawings, and stated in sixteen clauses, but which are not capable of being condensed. June 9, 1881. Price 1s. 2d.

2,539. M. Delnard, Plumstead. Chimney-top or cowl and ventilator.

This consists of a vertical pipe, whose upper end is enclosed in a perforated casing, and is provided with a flange or bell mouth, over which is a plate leaving a narrow aperture between the two edges. June 10, 1881. Price 6d.

2,555. A. Harvey, Glasgow. Water-taps or valves.

These are fitted with a ball of some slightly elastic substance fitting into a suitable seat, on which it is pressed down by a spigot. The pressure of the water underneath raises the ball and allows a free passage for the water when the pressure of the spigot is removed. June 13, 1881. Price 6d.

2,576. W. J. Hopkins, Worcester. Expanding and contracting fire-grates.

The side bars are arranged to slide backward and forwards, thereby expanding and contracting the grate. (Pro. Pro.) June 14, 1881. Price 2d.

2,588. T. J. Glærum, Christiansund, Norway. Locks, &c.

The chief feature of this is that the key is fitted with movable wards, which can move round the central stem a greater or less distance, whereby the picking of the lock is rendered more difficult. (Pro. Pro.) June 14, 1881. Price 2d.

2,605. W. T. Sagg, Westminster. Sun-lights.

Instead of placing the gas supply-pipe in the centre of the chimney by which the products of combustion are carried off, whereby the quality of the gas is deteriorated before it is used, the pipe is placed outside, and connected to one or more of the ribs of the framework of the lantern, which are hollow and serve as gas-pipes. The burners are connected with these ribs from below. June 16, 1881. Price 6d.

2,616. G. Hodson, Loughborough. Manufacture of chimney-pieces, columns, &c.

A plastic substance is made of cement and granite, iron slag, or broken stone, &c., which has been reduced to fragments. This substance is moulded to the required shape, and after being allowed to dry and harden it is painted, enamelled, and polished. June 16, 1881. Price 4d.

2,628. W. W. Beaumont, Camberwell, and J. Welman, Poole. Apparatus for dressing and cutting staves, &c.

A cutting or dressing tool is used, to which rapid vibratory motion is given by a small hammer, which is a piston working in a small cylinder driven by compressed air. June 16, 1881. Price 6d.

2,633. S. Hodgkinson, Manchester. Manufacture of window blinds.

The fabric is woven with dyed yarns. The desired pattern is printed on, and while the colours are moist it is passed through an enclosed chamber, in which gold and silver dust is caused to be agitated. June 16, 1881. Price 2d.

2,629. G. A. Wright, Portsmouth. Compositions for forming blocks for use in buildings, &c.

These blocks are formed of washed sand, breeze, Portland cement, lime, and loam, and may be used in building, both for walls and also as a substitute for wood. June 16, 1881. Price 6d.

2,636. G. J. Cox, Maidstone. Gas cooking and heating stoves.

These have closed bottoms, and the necessary air passes through heating spaces in the stoves to the burners, which, therefore, consume thoroughly heated air, and an economy is effected. June 16, 1881. Price 6d.

**The New Town-hall at Wandsworth.**—The new town-hall at Old Wandsworth, which has been in course of construction for the past eighteen months, has been publicly opened. The new building, which has been described in our pages, is built of red brick. The public hall is 85 ft. long, 38 ft. wide, and 26 ft. high, and is lighted with two large sun-burners, and a stage or platform 20 ft. by 20 ft., and it is seated for 750 people. The entrance-hall, which is 18 ft. square, is paved with tiles. The other departments embrace a large vestry-room, 32 ft. by 20 ft., with general offices for parochial business. The architect is Mr. George Patrick, and the builder is Mr. Edward Parsons, of High-street, Old Wandsworth. The decorative carving work has been executed by Mr. Hosowski.

## A NATIONAL HISTORY GALLERY.

Sir,—Your correspondent of the 21st has evidently leaped to his conclusions from merely reading the title and not the substance of my letter proposing the erection of a building to be entitled the "National History Gallery." I did not propose to collect historical paintings, but to employ living painters and sculptors to illustrate English history, in order that historical painting shall be encouraged in this country, and that there shall no longer be that dearth of historical pictures to which Mr. Standage alludes.

It is not a question about the housing of paintings already executed that I have attempted to discuss, but one touching the means for developing English art to its highest excellence,—a development which would carry with it the highest order of design in the manufactures, as the highest art did in all the great epochs. It is for mural or monumental painting that I seek to obtain grand fields for the exercise of the talents of English artists. Knowing what the history of art teaches upon this point, no English minister should hesitate to make a National History Gallery an accomplished fact.

Nevertheless, the gallery proposed might, in some architectural way, be associated with the above project. We require edifices which shall be entirely devoted to art purposes, to the embellishment of the metropolis, for we cannot depend upon buildings rigorously designed for the utilities of departmental purposes being æsthetic. There is possibly yet sufficient ground at South Kensington for a National History Gallery, and it is certainly high time, as your correspondent observes, that Mr. Geo. Scharf's anxieties should be diminished, and that the National Portrait Gallery should be housed in a safer and more appropriate building.

W. CAVE THOMAS.

## INVADÉD BY ANTS.

Sir,—I, like "H. S.," am a victim to this terrible plague. My friends from Tyburnia to Notting-hill join me in my lamentations, being equally afflicted. Even Belgravia is not free; I have heard of a gentleman in Eaton-square offering a thousand pounds to the beetle destroyer if he could cure the evil. The last time I dined in the Cromwell-road, I saw some of these creatures indulging in frolicsome antics on the table-cloth; they were, doubtless, brought in by the pastry cook. I had occasion in the autumn to stay at an hotel in the fashionable part of London. At breakfast the sugar-basin was full of these detestable little wretches. I called the waiter's attention to it, and he said, "It is very bad, sir; but you should see the —" (naming another fashionable hotel). "I have just left that; and the ants are much more numerous than with us." I started off for Brighton, and at an hotel there I found the sugar-basin exhibiting the same evidence of vitality. Some time ago I wrote to the *Times* on the subject; but I elicited no practical remedy. Something must be done, or London as a place of residence will be quite unendurable.

Before I went to the meeting of the British Association at York, I called on an old lady and told her I was going. She said, "Nonsense, what good do you ever do?" I tried to point out the advantages of meeting. She exclaimed, "Pshaw! it is all very well for Sir John Lubbock to make an oration about the advancement of science, but could he can tell me of something to rid me of the plague of ants, with which I am pestered, nothing will ever make me have faith in him or your fine science, more especially as these creatures are his pets, and I believe he encourages them. I recollect what the grocer said when I asked him for something to kill black-beetles. He replied, 'I could easily prescribe something, if I knew their language, for I am sure they tell each other.' Sir John Lubbock cannot plead this excuse."

I was not fortunate enough to see Sir John Lubbock at any of the Sectional Meetings, or I would have told him the anecdote, and besought a remedy.

To mitigate the woes of "H. S." I recommend the frequent and liberal use of *carbolic acid*. The creatures like warmth and moisture. Every approach to the supply of steam and top of the boiler (every night they hold their Parliament there) should be sprinkled with the acid. I go round with my servant and syringe every hole from which they emerge in single file. The tables and dressers are submitted to

the same treatment. The smell of the acid is very disagreeable, and though the servants sometimes complain they prefer the annoyance of that to being overrun with these detestable little insects. "H. S." will find that this course will circumvent them considerably. I do not say it will exterminate them; that must be left to Sir John Lubbock, "who knows their language," unless he pleads that, being a different species to those he cultivates, they have another dialect with which he is unacquainted. F. S. A.

Sir,—Apply with a brush a hot strong solution of alum to every chink or crevice infested; two such dressings will probably suffice to destroy the nests. Another plan is to pour some turpentine into a large flat dish and set light to it, and let it burn where the ants are most plentiful; this should be done two or three days in succession, and then "H. S." will not be visited by any more ants, at any rate for a time. But now that he has made his basement dry by laying down concrete, it will probably not be very long before other ants make their appearance. CHARLES F. MOXON.

## THE USE OF THE HYPHEN IN COMPOUND WORDS.

MR. R. RAWLINSON'S letter "On a Proper and Full Use of the Hyphen in Compound Words in Engineering Reports," which appeared in your issue of the 7th inst., calls attention to a subject which has a certain importance for those even who are outside the profession of which the writer of the letter is so distinguished a member; and it is for this reason that I have ventured to trouble your readers with a few observations thereon.

Years ago it was customary to leave to the printers the insertion of the necessary punctuation marks, hyphens, &c., the author being too much engrossed with the more important work of embodying his ideas in intelligible and grammatical form to attend to such comparative trivialities as these were then looked upon to be. When a work of a technical character was placed in the hands of the compositors, it was customary for them to consult with their "reader," and draw up a list of words in which the hyphen should be used, and those which should be printed as one word. This plan, though perhaps open to objection by the hypercritical, was generally successful in insuring uniformity in a work. After the author had returned a few proofs for press, the compositors were able to ascertain his wishes in regard to compound words, and if they did not happen to "square" with their own notions, the necessary alterations were made in the list. In this way compositors, "reader," and author were placed *en rapport* with each other; printer and publisher were alike satisfied; and public taste was not outraged,—at least, no how of indignation, so far as I am aware, was ever heard at the existence of this system. But, *tempora mutantur!* While the public have become more critical, printing "offices" have degenerated into "works," and the "hands" employed therein are of different mental calibre to their forefathers. "Follow your copy" is the order of the day; and hence the necessity that those who produce this "copy" should so write it that nothing is left to the judgment of the "hands" who put it in type.

It is about twenty years since I made an attempt to deal with the discrepancies now pointed out by Mr. Rawlinson, being at that time engaged on works in which a number of technical words were used, and I found that the following rule, although far from being without exception, was useful in practical every-day work:—Where two substantives are employed to describe one thing (the former indicating the object or purpose of the latter), the hyphen may be used when the two words joined thereby do not together exceed four syllables. For example, gas-pipe, i.e., a pipe for gas. According to this rule, the words "iron-cutter" would mean a tool, probably made of steel, for cutting iron; but an "iron cutter" would be a tool made of iron, and used for cutting some other material. I do not think it well to compound long words, and therefore I restricted the number of syllables to four. For example, an "oil-barrel" follows the rule and does not offend the eye; but "petroleum barrel" would be a rather ugly-looking compound. Again, "gas-filter," "boiler-fitter," but "pianoforte manufacturer."



As to uniformity, this is often affected by the position of words in a sentence. For instance, I should say, "I dine every day"; but, "My dining is an every-day occurrence." Here there is unquestionably a lack of strict uniformity; but how is it to be avoided? Suppose I am talking about the works of the much-abused gas and water companies, I shall say probably (in print) the London gas-works and the provincial water-works; but how am I to say the provincial gas and water works? Am I to follow the German plan, and tack a hyphen on to the word "gas" (gas), and then hyphen water-works? or am I to follow the Parliamentary printers' plan and make waterworks one word? or, better still, leave out the hyphen altogether? Mr. Rawlinson specifies the word "rain-storm." I think all "storms" are printed as one word now; but "waters" are generally hyphenated; and as double compounds are to be avoided, I should say "rain-water tank," "storm-water drain," rather than "rain water-tank," or "rain-water-tank;" also "soda-water bottle." Then as to "cess-pool" and "sub-soil," these should be one word. As a rule the prefix *sub* is hyphenated only when the word to which it is attached is a long one,—as sub-commissioner, sub-inspector, &c.

As to terms used in patent specifications, they are simply distracting. I recently met "electric-lighting. Gas-lighting (i.e., lighting by gas), as a compound, one can understand; but lighting by electric is too much. Again, we find gas-motor engine, gas motor-engine, and gas motor engine. I could give many other instances of the irregular use of the hyphen, but should probably only weary your readers by so doing. I will only say, in conclusion, use the hyphen sparingly; when once you begin to employ it you scarcely know where to stop. I think it much the best plan to omit it to a very large extent, and to what extent must, like the orthography of the name of the immortal Weller, depend much upon the "taste and fancy" of the writer. I remember once having to prepare an index of patents that literally bristled with words that, strictly speaking, should have been made compounds; but such confusion arose as to when to use and when to omit the hyphen, that I made a clean sweep of them all, to the delight of the compositors and the everlasting peace (as far as this work was concerned) of the printer's "reader."

X. Q. S.

### THE SMOKE NUISANCE.

Writing this in the noon-day, by artificial light, in a darkness which may be "due to unconsumed carbon and not to fog proper," but appears really to be an unfortunate mixture of both—while one is willing to admit that the efforts of the Kyrle and National Health Societies towards fog and smoke abatement are highly meritorious, one apprehends that neither the present nor the rising generation will witness very striking results, and is disposed to inquire "is such life worth living." Referring to the slow rate of sanitary progress it was remarked by myself some time since that "what is really wanted is instruction in cheaper and easier methods of sanitation than those recommended by rival inventors, and a little common-sense on the part of the public" (*Sanitary Record*, Jan. 4, 1878),—and the same applies to the treatment of our fire-places.

For the last quarter-of-a-century I have noticed that, as winter-time approaches, suggestions are made to the public, through the press, for the economy and more perfect combustion of fuel, all of which I have tried and thrown aside for the more simple and perfect plan I now adopt. I found, on lighting fires at breakfast-time, when most wanted, and when least required, an incandescent mass, to which fresh fuel had afterwards to be applied in the usual way. I tried metal and fire-brick bottoms, both perforated and not; these, more or less, cut off that necessary factor of a good fire—a plentiful supply of air, i.e. oxygen. I tried the admixture of coal and chalk, and, more than twenty years ago, the combination of coke and gas—now revived as a novelty—and found the necessary "pricker" most effectually spiked the gas-holes, slowly but surely blocked by the heat and dust, and that the coke, of course, had to be almost hourly renewed; this was soon replaced by a gas fire-place, the flue of which, being provided with an exhaust cowl above and plenty of fresh air below (since a patented "system of sanitation"), is eminently satisfactory. Anthracite,

which I have lately tried, produced more heat from temper than from coal.

I have carefully inspected the interesting collection at South Kensington and at the late Sanitary Exhibition at Brighton. Many of the inventions, so sedulously attended to, are unquestionably excellently adapted to the wants of the largest coal-burning city in the world, but it must be remembered that all this array of ingenious contrivances is not the outcome of the present movement, and that all their advantages have been allowed to lie dormant in the past so far as any general adoption, except some "Raritanies in garbages vast," and such, it is to be feared, will be their fate in the future, unless the Societies who have been instrumental in bringing together the collection can realise the inauguration of an enlightened public opinion, or can induce the Government to take up the question, apart from which, indeed, considering the intense apathy of the public, it may be conjectured to how many of the existing million of fire-grates in London alone will any remedy be applied. A new and important feature of the Exhibition is that all competitive stoves, furnaces, and fire-places are to be subjected to a really careful and thorough examination as to their various capabilities.

Doubtless close stoves are more likely to consume smoke than open fire-grates, but at the necessary sacrifice of important and vital ventilation provided by open fire-places said to be wasteful (?) of heat, in this respect comparing favourably with stoves, whether of china-ware or metal. Even in the draughty arcades of South Kensington one is struck by the sensation of baked devalitized air, and sighs for a tankard of the genuine air outside. Besides, an Englishman is not likely, without a strong protest and lively struggle, to give up the cheerfulness and companionship of his open fire-place, where he can "chew the food of sweet and bitter fancy" over its ever-varying aspect.

Under these circumstances I venture to describe the plan now used in the same old-fashioned grate, in which all these above-mentioned experiments have been tried. The fire, of the best bituminous coal, is to be well lighted in the usual way, with a small dry country faggot, in the vernacular "bobbin," or amply resinized wheel; two large fire-clay balls being placed on the bottom of the grate, so as to keep the material raised and to allow all possible access of air; the top should be touched as little as possible, in fact, the poker should be hidden, else some concealed intruder, who fancies he knows more about fires than anybody else, may violently stir it up and throw on half a scuttleful of coals—the usual plan; feed the fire through the bars with the shovel; there is one to be seen at South Kensington—patented, of course!—the larger jumps being judiciously placed by small hand-tongs now made for this purpose. A block of ship-timber should be placed on the top as occasion requires. A cheerful Turnersque-tinted fire, with little or no smoke, is the result.

P. HINCKES BIRD, F.R.C.S.

### HEAT.

HEAT may be considered as one form of energy, action, or motion, incapable *per se* of combining with gases or solids; therefore, to consider heat in a comparative sense of purity is absurd. The action or movement set up by heat in expanding the molecular constituents of bodies sets free the foreign elements or impurities contained in them. The evolution of these gases thus explains the phenomena of the disagreeable odours emitted by some kinds of stoves; the iron of which such stoves are formed is commonly of a very inferior character, and consequently the foreign elements becoming gaseous by expansion (the result of heat), and the molecules of the iron expanding, and the iron becoming more porous, the imprisoned gases are thus set free. If the iron were pure (e.g., in the form of steel) the evolution of odorous gases would not occur.

Hard-burnt fireclay, tiles, or bricks (owing to the high temperature requisite to fuse the silicate constituent contained in them) are most suitable for encasing stoves. The heat of an ordinary stove would be far below the temperature requisite to dilate or expand the molecular constituents of the hard-burnt fireclay or terracotta. For stoves or pipes used for the transmission or radiation of heat energy, the purest iron should be used.

The writer agrees with one part of Mr. Leeds's article, *e.g.*, that surfaces of mild temperatures uniformly distributed over the rooms are the most satisfactory; but such a system of warming is impossible with the ordinary coal fire; its position at one side of the area to be heated precludes the possibility of uniform radiation.

The American stove, situated in the centre of the space to be heated, is the system worthy of emulation, and could by very little attention, be made to combine (even to a greater degree) all the comforts, minus the discomforts, of the open and sometimes smoky fireplace, and the American stove is far more economical, theoretically perfect, and effective in action. By its adoption to all households (an easy matter) a great step towards the solution of the vexed question of smoke abatement and prevention would be attained. The stove, under the hands of a true artist, can be made quite as (if not more) beautiful than the ordinary open fireplace.

B. H. THWAITE, F.C.S.

### SKILLED LABOUR AND ITS TESTS.

SIR,—I have read with interest the letter from "A Clerk of Works" on "Skilled Labour" in your issue of the 21st inst. As I have a great deal to do from day to day with various classes of workers, half-workers, and no workers, I should be glad to suggest in your columns the possibility of a system of industrial certificates being some day arrived at. I am well aware that the "Livret" system is very unpopular and distasteful to the English "working men"; but, under existing circumstances, there is no criterion of workmanship, mere membership of a trade union, for instance, being by no means an infallible test, however strict may be the rule that only indentured tradesmen are enrolled. If some experienced men in the several departments of the building trade were to be accepted as an examining board, issuing certificates or diplomas of competence, we could at any rate roughly gauge the comparative knowledge of workmen offering themselves to employers and their agents.

I suspect at the present time the motto, *Palmarum qui meruit ferat*, is too often superseded by a rule that he who brings "palm oil" takes the palm. But on this point it might be indiscreet to write without fuller knowledge. I will content myself with the general suggestion that some sort of diploma should gradually be introduced. By the bye, where is the Trades Guild of Learning, and what is it doing in this direction?

ALSAGER HAY HILL.

Central Labour Exchange.

### COMPENSATION CASE.

GUILLET v. THE VESTRY OF KENSINGTON.

THE case was heard some time ago, the claimant being represented by Mr. Philbrick, Q.C., and Mr. Smith, instructed by Messrs. Shaw & Co.; and the Vestry by Mr. Littleler, Q.C., and Mr. Freeman, instructed by Messrs. Pontifex. The surveyors were Mr. Cooke Baines, of Finsbury-circus, and Mr. Reid. The property is the copyhold of the Manor of Kensington, held at a quit rent of 3d. per annum, and a fine certain of 6d. on alienation, and consists of a small shop and dwelling-house, No. 5, High-street, Notting-hill, being required by the Vestry under their Improvement Act of 1880. The frontage is a little over 12 ft., by a depth of 48 ft. Mr. Baines dealt with the property as freehold in possession, estimating it to be worth, after an expenditure of 60*l.*, a rental of 70*l.* per annum, which at twenty years' purchase gave 1,400*l.* He deducted 60*l.* for repairs, leaving 1,340*l.*; and adding 10 per cent. for compulsory sale, 134*l.*,—the total was 1,474*l.* From this a deduction of 30*l.* or 40*l.* would have to be made for enfranchisement. Mr. Reid put the value of the premises in their present condition at 65*l.*, which he took at twenty years' purchase, 1,300*l.* Adding 10 per cent. for compulsory sale, the total of his figures was 1,430*l.*, subject to the cost of enfranchisement. On behalf of the Vestry, Mr. R. Vigers put the rental value at 40*l.* per annum. This he took at twenty years' purchase, 800*l.*; and less 50*l.* for enfranchisement, 750*l.* He then added 10 per cent. for forced sale, making a total of 825*l.* Mr. Rogers (Rogers, Chapman, & Thomas) corroborated Mr. Vigers's figures. The arbitrator, Mr. Geo. Pownall, has recently awarded the claimant 1,000*l.*



# INJUNCTION TO STOP ERECTION OF NEW WALL IN FRONT OF PARTY-WALL TILL IT HAD BEEN REPAIRED.

PHILLIPS V. THE FIRST AVENUE HOTEL COMPANY.

In this case, which came before Vice-Chancellor Hall on Saturday last, the plaintiffs are tailors, carrying on business in premises in Holborn, situate at the corner of Warwick-court, opposite to Chancery-lane, and they sought to obtain an injunction restraining the defendants, who are erecting a large hotel on the north side of Holborn, between Warwick-court and Brownlow-street, from breaking into and interfering with the plaintiffs' party-wall, and from erecting any adjoining wall, until the plaintiffs' wall had been sufficiently repaired and strengthened to bear the increased weight. The plaintiffs' complaint was in substance that the defendants in constructing their works had pulled out timbers so as to leave a hole 1 ft. deep in the plaintiffs' wall, and had also taken away a chimney-breast, thereby weakening the plaintiffs' wall.

Vice-Chancellor Hall, being of opinion that he had no jurisdiction to grant a mandatory injunction upon an interlocutory application, refused the motion, upon an undertaking by the defendants to fill up the holes made by them, and not otherwise to break into or interfere with the plaintiffs' wall.

No time was lost in bringing the case before the Court of Appeal, where, on Monday last (before the Master of the Rolls and Lords Justices Brett and Holker), the order of Vice-Chancellor Hall was discharged, upon an undertaking by the defendants, within a week, to tie the independent wall to the party-wall at the base, and not to carry up the independent wall any higher until the work had been approved by the district surveyor, with liberty for the plaintiff's surveyor and architect to inspect the work. The costs to be costs in the action.

## STAINED GLASS.

**Bradford.**—Two stained glass memorial windows, of two lights each, have just been added to St. John's Church, Bradford (Yorks), the one being a "Buckley" and the other a "Pallas" memorial. They occupy one of the four-light windows, and complete the larger series on the south side. The subjects were selected from incidents in the lives of SS. Peter and Paul. They are respectively Christ walking on the Sea and inviting Peter, the Lord's Charge to Peter, the Conversion of Saul, and Paul Preaching at Athens. The colouring is in rather a subdued tone. The tracery lights contain angels bearing ribbands inscribed with texts. The windows are by Messrs. Powell Bros., Leeds, by whom also other windows in the church were executed.

**Leeds.**—The district parish church of Hunslet has just received an addition in the shape of a stained glass window in memory of the late Dr. Gisbourn. The window is of two lights, each divided into two compartments. The subjects illustrated are four of the specified "acts of mercy." In the tracery lights are blazoned the armorial bearings of the ancient Yorkshire family of "Gisbourn," territorially deriving from the old priory of that name, and the roof of the Gisbourns of Staffordshire, Derbyshire, &c. The window is by Messrs. Powell Bros., Leeds.

## CHURCH-BUILDING NEWS.

**Liverpool.**—The Church of St. Jude, Hardwick-street, Liverpool, has been re-opened, after having been for some time closed in order to effect certain alterations and improvements in the fabric. The church is one well known to the older inhabitants of Liverpool as being the church of Dr. McNeill. Before the work was taken in hand the east end was crowded by organ, pulpit, and desks, and the body of the church made not only ugly but unpleasantly stuffy by long, low galleries. There was no convenient vestry,—in fact, nothing which could give convenience to service or dignity to worship. By the clearing out of the chancel, by the introduction of a circular window at the east end and a new chancel arch, by the removal of the side galleries, which cast such a gloom over the interior of the church, and by the tinting of the walls, a pleasing transformation has been effected. The architect under whose direction these works have been carried out is Mr. James Brooks, of London.

**Winsford.**—The Winsford Weaver Navigation Church may fairly be taken as an evidence of the serious subsidence which takes place in the salt districts of Cheshire. This church, which was erected less than forty years ago (the late Mr. Edmund Sharpe, of Lancaster, being the architect), has had to be taken down; and we hear that the River Weaver Trustees have instructed Mr. Richard Beckett, of Hartford, to re-erect the same. It is stated that the structure will be built on the same foundations as before, using the old roof, seats, and fittings; but the walls are now to be built on the half timber principle, of strong timbers filled in with brick work on lifting beams, so making provision for lifting in case of any future subsidence. Mr. Beckett has recently lifted the Town Bridge a height of 4 ft. 6 in., under the direction of Mr. Stanhope Ball, the county surveyor. The Town Hall (with five shops, a corn warehouse, &c., attached) was also lifted by the same contractor, about two years and a half ago, a height of 8 ft. 6 in.

## Books.

*The Level of Hatfield Chase and Parts adjacent.*  
By JOHN TOMLINSON.

This is a good specimen of the kind of topographical and archaeological record which, as a general rule, is only accomplished by the enthusiasm of some one devoted to the subject, and willing to expend time and money on it without consideration for any commercial return. The neighbourhood here treated of is not the Hertfordshire Hatfield, most familiar to dwellers in the South of England, but a level piece of country near Doncaster, the drainage of which forms a great part of the subject of the history, as also of previous histories written but not printed; for Hatfield Chase seems to have been an interesting district to antiquarian students for some time past.

There is a great deal of matter as to the history of the families and properties included in the area treated of, which will be of interest to those more especially who are living near or connected with the neighbourhood, and which appears to be followed out with a degree of completeness and attention to accuracy which will establish the book as an indispensable volume of reference in connexion with its special subject. A chapter is devoted to Hatfield Church, which, though founded at an early date, appears, from the view given, to be now a Late Perpendicular church, not of very high interest architecturally. The great feat in connexion with the district was, however, the undertaking of draining it, a great part of the land being so near the sea level as to have been, within historical periods, subject to submergence at high tides. The artificial embanking of local rivers has rendered a considerable portion of land capable of cultivation, though below the level of high water in the Humber and the Trent. The author mentions some facts illustrating the great and recent changes in the sea line in this part of the English coast. "Ravenspurn was a noted port and town, more important once than Hull. It sent members to Parliament in the reign of Edward II. . . . and in 1471, Edward IV. made from hence his noted passage to York. For centuries before this latter period there had doubtless been a gradual wasting of the land, and now the deep waves have usurped dominion over the entire site of Ravenspurn. Two churches, those of Killesno and Withernesse, have been also swept away, the sea flowing where these sacred edifices once stood. It is needless to ask where the debris has gone to; 'Trinity Sands,' 'Sunk Island,' 'Read Island,' &c., will answer. The very bed of the Humber itself is constantly undergoing change, so that a pilot can scarcely tell, after one moon's tides, where the navigable channel is to be found. A large proportion of this mud or 'warp' finds its way by the Ouse and Don into this district of Hatfield Chase; and were it not for the violent freshets after heavy rains, which come down from the hills above Doncaster, scouring out the river bed, the latter river would long ere this have lost its identity." The author adds in a note that it is common to see in old maps such indications as "here stood Auburn, washed away by the sea," "Hartburn, washed away by the sea," that formerly Hornsea was ten miles from the sea, which now comes up to the town, and has quite extinguished the village of Hornsea Beck.

The history of the drainage of the district is then traced, the problem having been forcing itself on attention from an early period, though the dwellers in these half-submerged districts were by no means favourable to great drainage schemes, which they regarded as disturbances of the retired tranquillity of their lives. The great drainer and reformer of the district was Vermuyden, an eminent Dutch merchant in London, who entered into a contract with Charles I. to drain the land, on consideration of receiving one-third of the reclaimed land as his property. He brought over workmen from his native Holland, accustomed to similar engineering tasks. The Level was chiefly inundated by three rivers, the Don, the Idle, and the Torm. Vermuyden's plan was to cut straighter and more capacious water-courses and then fill up or silt up the old channels. The history of the progress of the scheme, and of the disagreements it led to, is of some interest; but we must refer the reader to Mr. Tomlinson's pages for further information.

Only a limited number of copies of the work have been printed, some for presentation to libraries and some for sale. The latter can be obtained through Messrs. Wyman & Sons. The book is illustrated with maps of the district.

*The Whole Art of Marbling.* By C. W. WOOLNUGH. London: Geo. Bell & Sons. 1881.

Not marbling as applied to the decoration of buildings, but as applied to paper, book-edges, and so on. It gives a good practical account of the materials used, and the way of using them in every kind of marbling practised. This book has been long before the public; the first edition obtained a commendatory letter from the late Professor Faraday (whom it interested because of his own early occupation as a bookbinder, and because of the principles of natural philosophy it involves), and the author since then has applied himself to make it more and more complete. The present edition includes a large number of specimens produced by this "pretty, mysterious art."

## VARIORUM.

The first volume, now complete, of "The Universal Instructor, or Self-culture for All," issued by Ward, Lock, & Co., Salisbury-square, makes a purely book bristling of information as comparatively small cost. Any young men or young women backward in their reading, who would give steady study in their leisure time to its contents for six months, would find the time well spent.—"Saker's System of Builder's Bookkeeping," by Sydney Saker (Cassell & Co.), appears to be the result of practical experience. The writer's object is to introduce a satisfactory system of keeping accounts by double entry. A good set of books is a prime necessity in a builder's establishment.—"Lessons on Form for the Use of Teachers and Pupils in Elementary Schools," by E. P. Wright (Longmans & Co. 1882), is, in truth, an elementary treatise founded on Pestalozzi's system of teaching geometry, and we quite agree with the author in saying that the lessons given will be found to cover a good deal of ground. Mr. Wright is the teacher of mathematics in University College School, London.—"Steam Heating for Buildings, or Hints to Steam Fitters," by W. J. Baldwin, Steam-heating Engineer, is an American book, which describes pretty fully steam-heating apparatus for warming and ventilating private houses and large buildings. It does not carry the subject beyond every-day work, but will be found instructive by many. A detailed specification is introduced as an Appendix, to familiarise the reader with an ordinary form of steam-heating work. Messrs. Trübner & Co. are the London publishers.—"Toys and Toymaking," by Jas. Lukis, B.A., is one of the little books issued from "The Bazaar" Office, 170, Strand (1882). It goes minutely into the subject, the part now before us treating of clock-work, steam, and electrical toys.—"We are not surprised that a fresh edition of "At Home" (published by Marston, Ward & Co.) has been called for. Cleverly illustrated by J. G. Sowerby, and quaintly decorated by Thos. Crane,—the verses characteristic and fitting,—it is just the book to delight the little ones,—and the bigger ones too.—"Real Whitty Jet" will form the subject of a descriptive and illustrated paper in the February number of *Cassell's Magazine*. The drawings for the paper have been specially taken in one of the largest jet manufactories in Whitty.



## Miscellaneous.

**Protection from Fire.**—A practical experiment in the application of revolving sprinklers to the protection of theatres from fire was tried a few days ago in New York, in the presence of two of the Fire Commissioners. According to the *American Architect*, the arrangement was devised by chief engineer McCabe, and consists simply in a series of revolving nozzles, like the lawn-sprinklers in common use, supplied by tanks over the stage, and set so near together that the showers from them will intersect, completely drenching everything under them, while the whole can be controlled by a single valve at any part inside or outside of the theatre. For trial, a space in West Third-street, under the Elevated Railway tracks, was selected to represent an imaginary stage, and four sprinklers were attached to the underside of the railway trusses above, and supplied through a hose by a steam fire-engine, throwing 600 gallons of water per minute. In less than a minute after the signal was given, the space representing the stage was flooded with water, to the great satisfaction of the Commissioners, who perceived at once the efficiency of such an apparatus in checking a conflagration. A similar arrangement has been brought forward in England more than once, but seems never to have made way.

**Insecure Mantelshelves.**—An inquest was held on Monday by Dr. Danford Thomas on the body of a little girl, nine years of age, who died from the effects of burns caused by a lighted paraffin oil-lamp falling upon her through the giving-way of a mantelshelf on which the lamp was placed. The child, it seems, had hold of the mantelpiece, which does not appear to have been properly fixed. The jury, in returning a verdict of "accidental death," expressed the opinion that the builder was guilty of great carelessness, and that the attention of the district surveyor should be called to the circumstance. What the district surveyor could do in the matter, unless, possibly, by taking proceedings under the Rancous Buildings clauses, is not very clear.

**The Proposed Statuary for Blackfriars Bridge.**—Attention is called to the length of time that has elapsed since this competition was instituted, and questions are being asked as to what has been the fate of the models sent in by the competitors. As we stated some time ago, the adjudicators were not able to recommend any of the models for execution, and it was referred to a committee to consider what further steps should be taken. Mr. James Edmeston, C.C., lately submitted a motion to the effect that a fresh competition be initiated, but by request he withdrew it, pending the report of the committee.

**The Water-Gate of York House.**—Something is at last to be done to rescue this neglected structure from its half-buried condition. At the meeting of the Metropolitan Board of Works on the 20th inst., it was resolved "That the contour of the ground in the Victoria Embankment Gardens, near the York Water Gate, be altered, so as to afford a better view of that structure, at an estimated cost of 15l." In the course of a brief discussion on the subject the hope was expressed that the owners of the structure would follow up the action of the Board by taking steps to arrest the further decay of the stonework.

**No. 90, Camberwell-road.**—"Camberwell Chambers."—These premises, used as a lodging-house for single men, are being enlarged by the addition of a new wing, approached from the old portion through a covered way, and giving accommodation for upwards of 160 extra beds, with lavatories, bath-rooms, washing and drying-rooms, &c., and a large kitchen, 55 ft. by 26 ft. The new buildings will be completed in a few weeks, at a cost of something over 3,000l. Mr. G. St. Pierre Harris is the architect, and Messrs. Taylor & Parfitt are the builders.

**The Sunday Society.**—The attendance at the Winter Exhibition of the Society of British Artists, on Sunday, January 22, 1882, was unusually large. During the three hours the Exhibition was open the Gallery was crowded, the total number of visitors being 1,822.

**Proposed Enlargement of Chelsea Work-house.**—We have received some letters objecting to the interference with the architect's plans (after their acceptance by the Board of Guardians), at the suggestion of a member of the Board not present when they were approved

**New Brompton, Kent.**—A new Wesleyan chapel has recently been erected by Messrs. Neale & Son, of Rochester. Mr. M. H. Pocock, of Queen Anne's Gate, Westminster, is the architect. It is planned to seat about 800 persons, and has cost about 2,000l. It is seated throughout with open deal benches, stained and varnished. The heating apparatus has been provided by Mr. Grundy, and the pulpit executed by Mr. H. Hems.

**Lewes Fine Art Exhibition.**—One article on show at the forthcoming exhibition will be a model of a section of the new breakwater now in course of construction at Newhaven, measuring about 5 ft. in length, 2 ft. 6 in. in width, and 2 ft. 3 in. in height. This model is kindly to be lent by the Newhaven Harbour Company.—*Sussex Advertiser*.

## TENDERS

For coach-house and stables, Portland-square, Bristol, for Mr. Ford, Mr. W. Cloutman, surveyor:—

	No. 1.	No. 2.—Extra.
W. Church .....	£283 0 0	£29 0 0
W. Court & Son .....	275 0 0	25 0 0
H. A. Forde .....	272 0 0	24 0 0
W. Ves's .....	254 0 0	23 10 0
T. Hill .....	248 0 0	26 0 0
Hayes Bros. ....	247 0 0	25 0 0
Eastbrook & Son ..	246 0 0	28 0 0
Thos. Young .....	233 0 0	25 0 0

For building seven houses and shops, Brixton-road, for Mr. Earle Bird, Messrs. Fowler & Hill, architects. Quantities by Messrs. Fowler & Huggan:—  
Pack Bros., \* Brixton .....

Accepted.—No competition.

For alterations to business premises, Western-road, Brighton, for Mr. W. Hetherington. Quantities supplied by the architect, Mr. Henry Branch:—

	Repairs.
E. Holloway .....	£540 0 0
G. E. Garbutt .....	474 8 6
Id & Son (accepted) ..	379 0 0

	Brass Shop Front.
Drew & Cadman .....	139 0 0
Dyson & Co. ....	134 0 0
J. Holmer (accepted) ..	118 0 0

	Shop Fittings.
Prebble & Son .....	539 0 0
G. Collis .....	370 0 0
Wm. Salter (accepted) ..	315 0 0

	Gas Fittings.
Packham .....	167 0 0
Green (accepted) .....	130 0 0

For repairs to the roof of St. John the Evangelist Church, East Dulwich, Mr. A. Bart, architect:—

Burman .....	£271 0 0
Mitchell .....	156 10 0
Stevens .....	103 0 0
C. Good (accepted) .....	92 0 0

For the erection of studios and chambers, Bedford-garden, Camden-hill, Mr. R. Stark Wilkinson, architect:—

Perry & Co., Bow (accepted) ..	£3,300 0 0
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For detached residences, Norfolk-road, Carlisle, Mr. Geo. Dale Oliver, architect. Quantities by the architect:—

George Black, Carlisle .....	£1,300 10 0
C. J. Armstrong, Carlisle ..	1,275 0 0
W. Court, Carlisle .....	1,239 0 0
H. R. Court, Carlisle .....	1,231 0 0
R. Little, Carlisle .....	1,215 10 0
John Irving, Carlisle .....	1,205 15 10
Jon. Bell, Carlisle .....	1,211 6 0
Batey & Foster, Carlisle ..	1,198 0 0
J. & W. Laing, Carlisle (accepted) ..	1,183 0 0
John Reed, Carlisle .....	1,149 13 0

For the erection of five cottages, at Bnfield, for Mr. S. Lynes:—

	Allow for Old Material.
Coote, Bnfield .....	£675 0 0
Richards, Bnfield .....	£215 0 0
Ranson, Bnfield .....	10 0 0
Boswell, Bnfield .....	10 0 0
Boswell, Bnfield .....	639 0 0
Boswell, Bnfield .....	7 10 0

For boiler-house, stove, &c., Great Freeman-street, Nottingham, for Messrs. Wright & Mulholland, Mr. Herbert Walker, architect. Quantities by the architect:—

Beel & Son, Nottingham .....	£346 0 0
Brook Hind, Nottingham ..	230 0 0
Bains & Burton, Basford ..	255 0 0
J. F. Price, Nottingham (accepted) ..	230 10 0

For alterations and additions to houses and shop, Basford, for Mr. Arthur Pearson, Mr. Herbert Walker, architect. Quantities by the architect:—

E. Legg, Basford .....	£223 0 0
G. Hopewell & Son, Basford ..	221 15 0
Bains & Burton, Basford (accepted) ..	220 0 0

For the erection of the City of London College, White-street and North-street, Moorfields, Mr. E. A. B. Crockett, architect. Quantities by Mr. J. Farrer:—

Outwater & Son .....	£14,612 0 0
Philp & Bakel .....	14,345 0 0
Bangs & Co. ....	14,338 0 0
J. Harper .....	14,338 0 0
Jones & Co. ....	14,145 0 0
R. Conder .....	14,115 0 0
J. & J. Greenwood .....	14,013 0 0
Scrivenor & Co. ....	13,745 0 0
Asby & Horner .....	13,670 0 0
Asby Bros. ....	13,730 0 0
W. Brass .....	13,655 0 0
Rider & Son .....	13,449 0 0
E. Morter .....	13,373 0 0
E. Lawrence .....	13,093 0 0
J. T. Chappell (accepted) ..	12,988 0 0

For new premises, Falcon-lane, Battersea, Mr. H. I. Newton, architect:—

Barman .....	£1,397 0 0
Steel Bros. ....	1,375 0 0
Lamble .....	1,367 0 0
Haycock .....	1,309 0 0
Gill .....	1,297 0 0
R. & H. Pickersgill .....	1,238 0 0
Williams .....	1,196 0 0

For the supply of 160 cast-iron posts, for the Maidstone Urban Sanitary Authority, Mr. J. S. Anscombe, C.E., surveyor:—

	Each.
Darling .....	£1 2 9 1
Baylis & Co. ....	1 0 8
Beck & Co. ....	0 19 7
Hill & Smith .....	0 19 6
Richardson & Co. ....	0 18 6
Rowell & Co. ....	0 17 9
Weeks & Co. ....	0 17 8
Garrett & Co. ....	0 15 0
Shrubsole .....	0 14 10
Noakes & Co. ....	0 14 3
Jukes, Colson, & Co. ....	0 13 8
Burley Iron Company .....	0 13 0
H. Warr & Co. (accepted) ..	0 12 6
Firmstone & Son .....	0 11 8 1

For the supply of 160 wrought-iron tubes, for the Maidstone Urban Sanitary Authority, Mr. J. S. Anscombe, C.E., surveyor:—

	Each.
Garrett & Co. ....	£0 8 4 1
Firmstone & Son .....	0 0 0
Rowell & Co. ....	0 5 6
Shrubsole .....	0 5 5 1
Baylis, Jones, & Co. ....	0 5 3
Burley Iron Company .....	0 4 4
Hill & Smith .....	0 4 3
Richardson & Co. ....	0 4 0
Weeks & Co. ....	0 3 6
Jukes, Colson, & Co. ....	0 3 5
Noakes & Co. ....	0 3 4
Beck & Co. ....	0 3 4
H. Warr & Co. (accepted) ..	0 3 1 1
Darling .....	0 3 1 1

For new market-hall, Burton-on-Trent, Messrs. Dixon & Maxon, architects. Quantities by the architects:—  
Chamberlain Bros., Burton-on-Trent (accepted) .....

£10,313 0 0

For additions to the Fir, at Warpleston, for Mr. J. W. Baxendale, Mr. C. F. Hayward, architect:—

	Wainscot.
Higgs & Hill .....	£4,434 0 0
Dove Bros. ....	375 0 0
Boyes .....	4,093 0 0
Lawrence .....	3,718 0 0
Boyes .....	264 0 0

For sanitary improvements, bath-room, and decoration, at Stanholm House, Edenbridge, for Mr. J. Stanford, Mr. M. Lawrence Caley, architect:—

Beale & Son .....	£209 0 0
E. Smith .....	298 0 0
R. Mackness (accepted) ..	271 0 0

For building four cottages, with drainage complete, for Mr. Frank Holmden, Edenbridge, Mr. M. Lawrence Caley, architect:—

J. J. Wile .....	£2850 0 0
R. Mackness .....	830 0 0
Dixon & Co. ....	780 0 0
Beale & Son .....	760 0 0
O. Goodwin .....	743 0 0
H. Elwig .....	740 0 0
Head Bros. ....	693 0 0
R. Jordan, jun. (accepted) ..	675 0 0

For external improvements to Marple House, Edenbridge, for Mr. Frank Holmden, Mr. M. Lawrence Caley, architect:—

R. Jordan, jun. ....	£184 0 0
R. Mackness .....	120 0 0
O. Goodwin (accepted) ..	120 0 0

For new Board schools, King and Queen-street, East-street, Walworth, Mr. E. E. Robson, architect. Quantities by Mr. W. H. Barber:—

Wall Bros. ....	£14,024 0 0
J. T. Chappell .....	13,383 0 0
Higgs & Hill .....	13,369 0 0
Stumpson & Co. ....	13,320 0 0
B. E. Nightingale .....	13,237 0 0
G. Marsland .....	13,165 0 0
T. Boyce .....	13,140 0 0
Gerrard .....	13,073 0 0
J. Grover .....	13,043 0 0
Altherton & Latta .....	13,000 0 0
W. Oldrey .....	12,774 0 0
W. Downs .....	12,737 0 0
Kirk & Randall .....	12,674 0 0

For enlargement of Drury-lane Board School, Mr. E. E. Robson, architect. Quantities by Mr. C. Brooks:—

Boyes .....	£7,193 0 0
L. H. & R. Roberts .....	6,629 0 0
W. Oldrey .....	6,448 0 0
Pritchard .....	6,436 0 0
Downs .....	6,376 0 0
Perry & Co. ....	6,361 0 0
W. Brass .....	6,097 0 0
Williams & Son .....	5,973 0 0
Kirk & Randall .....	5,962 0 0
Nightingale .....	5,881 0 0
J. Grover .....	5,847 0 0

For warehouses, St. Mary Overy's Wharf, London Bridge, for Mr. George Doo, Mr. Geo. D. Dunning, architect. Quantities by Messrs. Lindsay & Giffard:—

Higgs & Hill .....	£24,440 0 0
Burman .....	23,993 0 0
Patrik & Son .....	23,731 0 0
Brass .....	26,075 0 0
Conder .....	24,983 0 0
Holland & Hansen .....	23,023 0 0
Greenwood Bros. ....	22,893 0 0
Chafen .....	22,100 0 0
Kirk & Randall .....	21,310 0 0
Adams & Son .....	21,300 0 0
Perry & Co. ....	20,616 0 0

For Free Library, Oldham. Mr. Thomas Mitchell, architect:—  
 Crowther Bros., Oldham.....£10,320 0 0  
 Brown, Salford.....10,400 0 0  
 Meadows, Stockport.....9,800 0 0  
 Wood, Bootle.....9,740 0 0  
 Dodd, Oldham.....9,600 0 0  
 Schofield & Co., Oldham.....9,650 0 0  
 Lees, Oldham.....9,500 0 0  
 Herd, Manchester.....9,387 0 0  
 Peters, Rochdale (accepted).....8,799 0 0

For re-building the White Horse Tavern, Poole Park Estate, Parson-green, Fulham, for Mr. W. Chapley. Mr. George Treacher, architect:—  
 John Beale, Westminster Bridge-road.....£2,493 0 0  
 Accepted.

Gas Fittings.  
 W. Nunn, Borough (accepted).

For new roads, sewers, and surface-water drains, at Horsey, for the British Land Company. Mr. Henry B. Michell, surveyor:—  
 Paill & Sons, Bromley (accepted).....£4,579 3 5

For new roads, sewers, and surface-water drains, at Leyton, Essex, for Messrs. Melk & Passmore:—  
 Jackson, Leyton (accepted).....£3,993 0 0

For the construction of road and drainage works, on the Lurgan Avenue Estate, Fulham, for the United Land Company:—  
 Wilson & Stockhard, Leyton.....£739 0 0  
 John Ball, Chislewick.....538 0 0  
 Rowles & Chapman, Acton.....635 0 0  
 W. Harris, Southamton-street, E.R. 562 0 0  
 G. Felton, Kilburn Bridge, N.W. 547 0 0  
 Nowell & Robson, Kensington.....545 0 0  
 Dyer & Huxley, Longborough-lane, 538 0 0  
 Wilkes & Co., Devonshire-square 537 0 0  
 C. Lyon, Wandsworth.....509 10 0  
 W. Nicholls, Wood-green.....487 15 0  
 Toomes & Wimpsey, " Hammer-smith 483 0 0  
 Accepted.

For alterations, repairs, and forming two new shop-fronts, at 102 and 164, Queen's-road, Bayswater. Messrs. Joseph & Pearson, architects:—  
 Langmead & Way.....£1,673 0 0  
 Asford.....1,597 0 0  
 Stimpson & Co.....1,513 0 0  
 Sawyer.....1,494 0 0

For the erection of stables and other buildings, in Clareville-grove, West Brompton, for Mr. W. Follett. Mr. C. Edwards, architect:—  
 Niblett.....£1,937 0 0  
 Crosse.....1,883 0 0  
 Lucas & Son.....1,871 0 0  
 Higginbottom.....1,780 0 0  
 Squire & Co.,.....1,737 0 0  
 Stimpson & Co.....1,673 0 0  
 Green.....1,604 0 0

For alterations, additions, and repairs to the Rectory, St. Barnabas Church, Addison-road, Kensington. Mr. W. Baker, architect. Quantities supplied:—  
 Dye Bros.....£2,275 0 0  
 W. Nash.....2,230 0 0  
 Patman & Fotheringham.....2,173 0 0  
 Lucas & Son.....2,100 0 0  
 Admon & Sons.....2,050 0 0  
 C. Wall.....1,988 0 0  
 Macey & Son.....1,930 0 0  
 Stimpson & Co.....1,920 0 0  
 Johnson.....1,890 0 0

For proposed alterations to 13, Lower Seymour-street, for Mr. C. Batt. Mr. Sancton Wood, architect:—  
 Saunders.....£1,355 0 0  
 Stimpson & Co.....1,316 0 0  
 Higgs.....1,195 0 0

For the erection of new training stables and trainer's house, at Exning, Newmarket, for the Earl of Zetland. Mr. F. Beeston, architect:—

	Stables.	House.
Kinmont & Sons.....	£2,344 0 0	£2,316 0 0
Grimwood.....	2,298 0 0	3,577 0 0
Reading & Son.....	2,570 0 0	3,710 0 0
Bell & Son.....	6,122 0 0	3,200 0 0
Green.....	8,182 0 0	3,075 0 0
Mason & Son.....	8,090 0 0	3,040 0 0
Stimpson & Co.....	8,065 0 0	2,935 0 0
Wilkes Bros.....	7,593 0 0	2,988 0 0

For laying down new granite carriageways and York-stone footways, in Camberwell-road and Church-street Camberwell, and High-street and Queen's-road, Peckham, and executing other works in connection therewith, for the Metropolitan Board of Works. Sir J. Bazalgette, engineer:—

Hill & Co.....	£24,537 0 0
J. J. Griffiths.....	22,263 0 0
Wheeler & Hindle.....	21,500 0 0
G. G. Ratty.....	21,225 0 0
Cooke & Co.....	20,700 0 0
W. T. Hook.....	20,900 0 0
Nowell & Robson.....	20,485 0 0
Bottoms Bros.....	19,970 0 0
Mowlem & Co.....	19,488 0 0
Turner & Sons (accepted).....	18,992 0 0

For additions, &c., to Railway-bridge over the Cheyair, Cuddapah, Madras, for the Madras Railway Company. Messrs. Sir John Hawkshaw, Son, & Hayter, engineers:—  
 Stanley, Hall, & Co. (accepted).

For the construction of storm-water sewers, in London-road and St. James's-road, Leicester, for the Corporation. Mr. J. Gordon, C.E., Borough Surveyor and Engineer:—  
 J. Hutchinson & Son, Leicester.....£275 0 0  
 John Lee & Co., Leicester.....618 0 0  
 C. Cowdery & Sons, Newark.....405 3 0  
 H. Hilton, Birmingham.....471 18 0  
 J. Smart, Nottingham (accepted).....470 15 3

#### TO CORRESPONDENTS.

W. W. L. A. R. W. R. O. W. J. M. J. E. P. H. R. D. M. L. A. G. T. F. R. H. G. Co. R. H. M. F. A. F. S. O. Jan. H. H. G. M. R. S. W. J. D. H. R. W. B. S. S. P. Bro. H. T. R. S. R. S. B. W. B. S. B. S. F. M. L. O. L. R. J. O. N. G. B. J. H. R. F. H. A. H. W. O. S. & Co. H. W. & Co. W. G. H. H. G. C. I. O. (not necessarily expeditious—T. W. H. [we have a ready printed reply] Prout (we cannot print) Personalities from unknown writers—C. J. I. (shall appear)—T. O. H. (next week)

All statements of facts, lists of tenders, &c. must be accompanied by the names and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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# The Builder.

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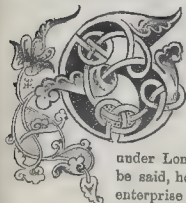
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### London at Piff's Mouth.



**ROLOGISTS** continue to express their conviction, not only of the possibility, but of the high probability, of the existence of coal, at an attainable depth, under London itself. It may be said, how is it that private enterprise can allow such an important question to remain in

doubt? Not only is it one which it is possible to solve, but the solution could be arrived at in a definite time, and for a definite and not enormous cost. The reply probably is that, interesting as such a discovery would be to the man of science, it would be nothing short of dismaying to the man of business. If once it were known that coal lay beneath our feet,—so near to them that we only had to sink pits of less depth than are in constant work in many parts of the world in order to raise it,—how long would it be before promoters, and explorers, and company-mongers would be at work? And not only at work at their natural business of "raising the wind," but, sooner or later, at the real practical business of raising coal. And what would be the effect of thus virtually transporting London to the mouth of the pit, and to the centre of the Black Country?

We think it is undeniable that a double action would immediately be set up on the commencement of collieries in or close to London. Manufacturing industry, of all kinds, would be attracted to a spot where the factory could be feared in the midst of the market. This would mean the depletion of the manufacturing districts, and the enormous inflation of the metropolis. What has led to the localisation of the steel trade in Sheffield; the woollen and cotton industries at Leeds, Bradford, Oldham, and other Great towns; the commercial exchange at Manchester; the manufacture of arms, screws, pins, and all manner of metal ware at Birmingham, but the command of cheap coal? In all these places the commodities are manufactured far from the market where they are to be sold. With regard to many of them, they are supplied with raw material from enormous distances, involving not only maritime but inland carriage. And then, again, they have to pay carriage on the finished article. By manufacturing on the banks of the Thames a double inland carriage would be saved. The commodities would be produced close to the best market. The three northern railways, the London and North-Western, the Great Northern, and the Midland earn between them more than six millions per annum for the carriage of merchandise. It is a very modest estimate that a third of this cost would be saved to manufacturers if they established their factories in London; and here are a

couple of millions a year by way of inducement to begin with.

The only *per contra* that we can see is that wages might be higher. But this is a point on which it would be unwise to count. Facility of transport, on the one hand, and freedom of communication on the other, are daily tending to level the rates of wages throughout the country, and, as far as free trade is active, throughout the world. Thus that our manufacturing districts would be gradually deserted, and that the actual over-density of London would be correspondingly increased by cheap coals, we think is undeniable.

It is, therefore, with some satisfaction that we observe that some of the arguments now relied on in favour of the opening of future London collieries seem to point in the opposite direction. We may frankly admit the feasibility of the general view that the coal-measures which commence with the elevation of the cliffs of the Pembrokeshire coast, which supply Bristol with coal, which have been traced below the surface for six or seven miles to the eastward of the open Bristol coalfield, which are again found near Boulogne, and which stretch on to Westphalia, may dip beneath the London basin. It is another question, however, whether beds that are geologically equivalent are minerally equally rich. The thinning-out of a bed, or the replacement of a fluvialite or marine deposit by the results of some contemporaneous, but wholly different action, is one of the most ordinary geological phenomena. As to the occurrence of changes of this kind, all that can be asserted with safety is the impossibility of accurate prediction. It is only by striking a coal-seam that its presence can be ascertained, or its depth and mineral character can be made known. Now, the information which has up to this time been in this manner definitely obtained seems to us rather to negative than to support the theory of workable coal existing under London.

It has been long known that the well sunk to the depth of 1,144 ft. at Meux's brewery in Tottenham-court-road, and the well of a like depth at Kentish Town, have reached the sandstone; although geologists are not yet agreed as to the age of the deposit thus pierced. But in "The Water Supply of England and Wales," p. 188, it is stated that Devonian fossils from the mottled beds of purple and green argillaceous and micaceous shales are identified from the lower 80 ft. of this boring. If this be so, there is an end of the matter. The more perfect mode of extracting the core of a boring which is secured by the use of diamond cutters has enabled the engineer to identify the sandstone reached at the depth of 940 ft. at Chessington, and of 796 ft. at Ware, with the Devonian formation, according to Mr. de Rance. But the Devonian rocks lie below the millstone grit, which is the floor of the coal measures. It is therefore certain, if the identification of the rock reached be

correct, that there is no coal below the surface at Chessington or at Ware. Again, at Battle, in Sussex, a depth of 1,800 ft. has been sunk without getting beyond the Oxford clay. This certainly seems to prove that the line of palaeozoic rocks, of which so much has been said, is not of any very great width, and is so far against the theory of a deep deposit of coal on what may prove a narrow axial line. At Burford, we are told, the coal measures are reached at a depth of 1,184 ft., and at Northampton at a depth of 830 ft. But that throws very little light on the subterranean formation of the Thames Valley. At Oxford the thickness of oolite and lias together is only 420 ft., which contrasts with the depth attained at Battle. At Cressness, according to the work above cited (p. 251), 67 ft. of sandstones and marls commence at the bottom of the gault, which is 1,003 ft. below the surface. "Mr. Whitaker points out the strong improbability of the bottom beds at Cressness and Kentish Town being part of the Old Red series, when rocks of true Devonian type occur at so short a distance as Meux's brewery, which is, in fact, between the two; that two types of one geological system should occur in the same limited area seems well nigh improbable."

The relations between the Devonian strata and the overlying carboniferous rocks is stated by Mr. Woodward ("Geology of England and Wales," p. 70), "not to be quite clear in South Devon, owing to disturbances, but in North Devon the beds gradually pass into the others." At the junction of the culm measures and the Devonian strata are found several calcareous bands, which have been regarded as partly representing the mountain limestone. In South Wales, about Haverford West, the carboniferous system becomes much attenuated, and in Ireland it is sometimes replaced by slate. Towards Derbyshire the calcareous element becomes less, and the series consists of bands of limestone intercalated with slates and sandstones, and containing seams of coal. It is hence inferred that some of the upper portions of the Devonian series may be parallel with the lower carboniferous strata of other districts. It is admitted on all hands that the lowest Devonian strata are identical in character with beds of the Old Red Sandstone. But nowhere is there any evidence of the occurrence even of culm, far less of solid seams of coal, below any distinct member of the Devonian series. Of course too much importance may be assigned to a name. What is important is, not to know what the sandstone ascertained to lie at from 1,000 ft. to 1,200 ft. below London is called, but whether it is of an older or a more recent formation than the coal measures. As to this, the statements of Mr. de Rance are confused, as he (p. 252) speaks of the rocks struck at Tottenham-court-road as being "of true Devonian type"; while yet he thinks that the red rocks at 1,020 ft. deep at Cressness "are referable to the Keuper marls." But these form a portion of the trias. Between



these two statements it is hardly possible that there should be any serious doubt, on the part of an accomplished geologist. On the evidence at our command, therefore, to say nothing of the negative results of the Sub-wealden exploration, which reached, in 1874, the depth of 1,906 ft. without passing through the Oxford clay (*op. cit.* p. 274) it would rather seem that the coal measures must have thinned out and disappeared west of a line running from Kentish Town, by Meux's brewery, to Crossness, and that no coal exists under London.

We have gone with rather more minuteness than we should have otherwise done into the question, from the feeling that a little plain speech on the part of the men who know most on the subject may save a good deal of debate. "Palaeozoic" is a large word. Mr. Woodward applies it to the carboniferous system as the highest rocks under the title. Dr. Haughton includes the Permian system under the name. Between the upper strata of the Permian, and that of the Devonian rocks is a distance, according to the latter authority ("Manual of Geology," p. 125), of 17,600 ft. True, while two writers or speakers may use the same language, they may mean something very different. All agree that Palaeozoic rocks exist beneath London. But whether the fossils from the borings at Kentish-town, at Tottenham-court-road, and Crossness come from beds known to lie above or below the 14,000 ft. or 15,000 ft. of the coal measures is just the key to the question. We have given our opinion of the outcome of a somewhat confused statement. But we are fully open to correction, if wrong. What is of interest for those who care for the welfare of London is a plain answer to a plain question, and we trust that that answer will not be applied for in vain.

In a word, at from 1,000 ft. to 1,200 ft. below the surface of the London streets exists a red rock, the position of which in the geological series is now in doubt, to a margin of some 17,000 ft. We cannot understand this doubt. For the rock to be Devonian would imply a denudation of so enormous an amount, prior to the deposit of the Lower Green Sand, that it would require very distinct proof in order to accept. A ridge of Palaeozoic rock, it is stated by Professor Prestwich (*Proc. Inst. C.E.*, vol. xxviii, p. 119), extends from Westphalia to the south of Ireland. In the Ardennes, where the formation is best shown, it consists of a central axis of Silurian strata, flanked by Devonian rocks, and then by carboniferous strata. These are contorted in every possible direction, forming narrow troughs and ridges. In one of these troughs, only from three to six miles wide from north to south, and 184 miles long from east to west, the crushing together of from 7,000 to 8,000 ft. of coal measures forms the coal basin of Belgium and the North of France. The horizontal beds of the newer formations repose on the upturned edges of the Palaeozoic rocks, so that a short distance will vary to a great extent the depth at which the latter are struck, without any perceptible difference in the depth of the newer deposits. Now we find that the same stratum is reached at a depth of 1,113 ft. at Kentish Town, and of 1,084 ft. at the lower level of Tottenham-court-road, which certainly looks more like the comparatively level beds of the Trias strata, and not like the contorted "lie" of the Devonian rock.

But the Triassic rocks of the South-West of England, as laid bare on the shores of the English Channel, have a thickness of 3,000 ft. (See "The Geology of England and Wales," p. 136.) Under these lie the Permian beds, which in Shropshire, Staffordshire, and Worcestershire attain a thickness of about 1,500 ft.; and in Lancashire, with a different physical type, reach an equal thickness. Again we pass through some 900 ft. of coal measures before attaining solid coal. Then we have a series of strata which, where they have been measured, amount to an aggregate thickness of 5,100 ft., or more than a mile, which may intervene between the sandstone that lies 1,100 ft. under Tottenham-court-road, and a workable seam of coal.

The increase of temperature which accompanies the descent below the surface has now to be regarded. It is an ascertained fact that at a depth of 2,700 ft., the temperature of the earth reaches that of the blood, or 98° Fahrenheit, and continuous human labour is impossible. If, therefore, that geological guess be right which says that Meux's well has struck Devonian rock, there is absolutely no coal under London. If, on the contrary, that guess be right which

prefers New Red Sandstone, all the definite information which we have as to the depth of the Trias and Permian strata leads to the conclusion that while coal may lie under us, it must be at a depth inaccessible to man.

#### THE ARCHITECTURAL TREATMENT OF IRON.

THE attempt made at the last meeting of the Institute to arrive at some conclusion as to the treatment of iron as an element in architectural design and construction should hardly, perhaps, pass without a word of independent comment, considering the importance of the subject. The scope of the paper read seems to have been a little misunderstood by one or two of those who contributed to the discussion. The object of Mr. Stannus, who read the paper, evidently was not to discuss the ornamental treatment of iron in a decorative sense, about which we are not now in much difficulty or indecision, but its treatment when forming part of the construction, or, as we have headed it above, its "architectural treatment." That this division of the subject was not entirely recognised is evident from the fact that one speaker, after the paper was read, alluded to the high qualities of Spanish ornamental ironwork, which had not been mentioned in the paper. This, of course, as Mr. Stannus mentioned in reply, was out of the true scope of his paper. The question of the merely decorative treatment of iron in an ornamental sense, and when it is apart from the main construction of the building, is not a new one, either theoretically or practically, nor are we at a low ebb in regard to it. On the contrary, work has been done in wrought iron by modern workers equal to almost anything that exists, though, of course, partially imitative of old forms and styles. But the question of the employment of iron as an integral part of architectural structure, and of its artistic treatment when so employed, is entirely a modern one, and one that at present is hardly solved or settled at all.

The question resolves itself into two: first, how far is it desirable to make iron an integral part of architectural structure; secondly, how to treat it artistically when so used. As to the employment of iron as the sole constructional constituent of a building, which was dreamed of as the suggestion for a new style when the Crystal Palace first attracted every one by its success, the palace itself has answered that with a most decided negative. Such a construction may be admirably adapted for a temporary building, but not for a permanent one, even on economical grounds. In the property of "never sleeping" the iron is worse than the arch, requiring continual nursing and repairing and painting. In regard to the partial use of iron in combination with other materials the practical difficulty is less in one way, that the amount of material requiring constant looking after, and liable to constant decay from rust, is less in proportion to the total expenditure on the structure, and it may then be in accordance with economical principles to employ iron in this partial manner. Then there is, of course, the practical necessity for employing iron in some form or other in cases where the bridging of great spaces without supports is required, as in our modern railway stations; cases in which only iron, with its combination of tensile strength and lightness, can meet the practical demands of the architect.

The economical question is easily settled, of course; it is a mere matter of figures. What it is not so easy to settle is, how far the use of iron can consist with anything like the highest architectural effect and expression. It must be admitted, even by the greatest partisans of iron, that its employment throughout the entire construction is inconsistent with any effect of monumental perpetuity of construction. There are, perhaps, structures in which such monumental effect would be out of place. To a great extent it may be so in the case of railway stations. Considering the rapid progress and changes of mechanical science, and also the shifting of routes of traffic and centres of population, it may be legitimate to regard the great railway stations as structures put up to last a limited time, and then shifted or enlarged, or otherwise altered, to adapt them to altered circumstances. Under such a supposition monumental expression would be unobtainable, and iron would provide most cheaply and conveniently all that is wanted for a limited time. But we may hope still to have

structures built, of one class or another, the object of which shall be to stand as long as architecture may stand. And if we are asked whether in these iron can form an integral part of the construction, we are constrained to reply, not without foregoing the most distinctive characteristics of monumental architecture. We have only to put London Bridge and Blackfriars Bridge in comparison to be sensible of the distinction. The first is an architectural monument, the second only an engineering construction.

Fitting aside absolutely monumental structures, and looking to that large class of buildings which stand midway between monumental architecture and mere utilitarian construction providing for the exigencies of the moment, we do not see why iron should not be used in combination with brickwork and masonry, in the same kind of way that timber used to be; and, perhaps, if rightly employed, with nearly as good effect. We do not agree with what was suggested by one speaker in the discussion, that it was more difficult to treat iron architecturally in connexion with other material than to treat it alone. The contrary seems to us to be the case. With masonry to work upon, for instance, there may be at least a solid architectural basis secured, on which the iron may come as a lighter superstructure. In this way an iron construction upon solid walls might really take the place of an upper half-timber story upon solid walls, an effect which we know is very good architecturally, but which has its drawbacks constructively, and which is forbidden in towns by most of our Building Acts, as involving danger from fire. In this respect a question asked by one speaker at the meeting of the Institute, Mr. Elkington, was very much to the point, viz., "Would it be a legitimate use of iron in construction to make a façade of a kind of framework of iron, filled in with panels or slabs of terra-cotta or other material?" We should say decidedly it would, for at least a portion of a building, and provided there were a good solid basement story to bind the whole together and give it practical as well as architectural solidity; that is to say, it is legitimate just as far as and in the same way as half-timber work is legitimate, which also is scarcely ever built up in that way from the ground, and would hardly look satisfactory if it were. We look on this, in fact, as rather a good suggestion, not wholly a new one, for town architecture, which might be worth taking into further practical consideration.

But as to the details of the architectural treatment of ironwork it is very difficult to say anything decisive, because we are here in the face of a material quite *sui generis*, and for the architectural treatment of which there is no precedent; and it is so exceedingly difficult for any one in these days to put himself outside of precedent, and to regard the material entirely apart from the architectural forms to which he has been accustomed. Hence we have had iron treated in columnar form, and with imitations of the ordinary Classic and Gothic carved capital, without any serious consideration as to whether such forms were really a suitable or even a natural way of treating the material. Some remarks, which were at least suggestive, were made in regard to this point in the course of the Institute discussion; one especially, as to the possible greater fitness of employing all vertical iron supports in the form of flanges with a cross direction in section, so as to allow of every part of the iron being visible, instead of casting them into the shape of hollow columns in which great part of the surface cannot be seen, in which there is great difficulty in ensuring equable thickness and strength, and in which there may be lurking flaws which it is much more difficult, at least, to detect than it would be in the case of a flanged upright. Of course the architectural treatment of such a flanged column, especially at the point of the impost, would have to be something quite new and different from what we have previously seen in iron design, or, in fact, in architectural design of any kind; but here would be precisely the discreet architect's opportunity, or should be, if he will avail himself of it.

In regard to one or two of the remarks in the discussion, we may question, in the first place, whether the praise meted out to the engineers by Professor Kerr (whose remarks on other respects were an important contribution to the discussion, and very practical) was not beyond their deserts, in regard to their iron work being no sham, because they "did not attempt to make it beautiful." This is certainly



not altogether true of the engineers, for they too often do attempt to fashion iron in shapes which are called for only by some special notion about architectural design derived from precedent, and they make capitals and other features which are "shams," and are quite out of place. Again, in regard to not concealing the joints, Mr. Fowler's instance of the bosses in Gothic architecture was certainly not to the point, as they are not put to conceal "joints" in the construction, but to conceal or avoid the difficulty of mitres with mouldings meeting at various angles. The argument by the same speaker, that there was no need to make the abacus of the iron column coincident in plan with the mouldings which it carried, because in Gothic work the cap was often designed quite apart from the section of the mouldings above, struck us as curious. This is as much as to say, that because something illogical was done in Gothic architecture, therefore it is right.

We may suggest one use of iron in architectural construction, which was hardly touched upon, and that is its use as a tie between the skewbacks of an arch of other material, by which the iron is used in tension and the masonry in compression, and which renders possible the use of the arch in circumstances in which it would otherwise be impossible or inconvenient. This is a distinct principle in the utilization of iron in architectural construction which has not received the attention it deserves; and iron, if so used, has generally been used only in an accidental way, and concealed as much as possible. It might be made the hint for a special treatment. The most stupendous instance of falsification in regard to the use of iron as a skewback tie, by the way, is in the construction of St. Pancras Station. Here there is actually a sham buttress, from which the iron principals appear to spring, while in fact they are carried through and tied at the feet by a great set of ties going right across the station under the platforms and the railway. Few people, not engineers, who admire the great span of the roof, are aware probably of the concealed means by which its stability is ensured.

Mr. Stannus deserves credit for his spirit in taking up so difficult a subject, and his paper, when printed in full, will be a useful contribution to the Transactions of the Institute of Architects.

#### THE PRIZE WORKS EXHIBITED BY THE GOLDSMITHS' COMPANY.

THE premiated works in the Goldsmiths' Company competition are now on view at the South Kensington Museum. We understand these are the result of the tenth competition, invited by advertisement in January of last year. There are some dozen and a half which have gained prizes, and half a dozen more which are "commended," together two dozen; and these exhibit, if we are to accept them as a representative selection, the response of the designers of England to the munificent offer of twenty-six prizes amounting to an aggregate of 510*l*.

We observe that only fifteen out of the twenty-six prizes have been awarded; and that no works are exhibited in competition for two important prizes in design, and for the nine prizes offered for "workmanship"; but, in the absence of any report beyond the advertised list of prize-winners, we are unable to state if any works were submitted for these unawarded prizes. The Company very naturally reserve the right to withhold any of the prizes, and possibly they may have acted on this; though, if they had exhibited more of the works submitted, we might be better able to judge of their standard.

Reverting to the advertisement, we find prizes of 50*l*. and 20*l*. for a model in plaster ready for casting of a "Man and Horse" were offered. Mr. W. White, of Chelsea, takes the first premium by a spirited model of "Horne the Hunter" leaping into a stream, with a dog already breathing the current: the idea is excellent, and well carried out; but there is nothing either in design or modelling to suggest silver more than bronze or any other artistic metal; and if a dog may be added why not a second horse, also a second man, also any number of horses, and men? The model taking second premium, by Mr. W. Roobe, of Camden-town, of "Tailfefer" at the Battle of Hastings, shows more adaptation to the material; the shirt of mail giving opportunity for burnishing; but the rearing horse is somewhat tamely modelled, and there is a lack of expression in the face of the jongleur. Mr. H. Ellis, of Dulwich, is commended "for

motive only," for a model showing a Mexican lasso-thrower.

For a copy in *repoussé* work of the Bacchante by Scopas, 35*l*. and 20*l*. were offered; these have been gained by Mr. G. H. Deere, of Islington, and Mr. Osterlag, of Barnsbury; while an extra prize, equal in amount to the second, has been awarded to Mr. Thomas Spall, of Birmingham, and Mr. A. W. Edwards, of Canonbury, is commended. This is an excellent competition; all are good, and the first prize is well deserved by a fine piece of beating-up; we are glad to see we have such able *repoussé* workers in England.

As response to the prize of 15*l*. offered for "the lightest and best specimen of core-casting in silver (the jets to be cut off, and the seams from the mould to be left absolutely untouched)" of a small prescribed statuette, two are exhibited. Both seem fair as casts, but in the absence of any accompanying statement of weight as compared with that of the plaster model, we are unable to state which is the better. In both of them, unnecessary holes for unnecessary corrects have been made through the joins. Mr. G. Broad, of Marylebone, who is placed first, appears to have avoided the junctions of jets on the surface by casting his figure head-downwards and pouring through the pedestal, but his metal has escaped a little at the seams. His competitor, Mr. W. Priest, of Birmingham, who receives an extra prize, equal in amount, has made use of seven jets at the side, some of which, being in places difficult to obase, may have turned the scale in the adjudication.

The sums of 25*l*. and 10*l*. as prizes for engraving, the task being the figure of Agriculture in "Avalra, Pentelici," have elicited two good specimens of well-fell and clean-cut work; Mr. W. H. Court, of Birmingham, deservedly taking first, and Mr. J. W. Jenkins, of Chelsea, being a good second; while Mr. P. Bellevue, of Paddington, is "commended."

These prizes for Technique have been well won, and the works are creditable, but the Designs are a sorry lot, and far below the level of former years. The chief prize of 30*l*. for a branch-candlestick, and one of 20*l*. for a tea-service, are not awarded, and no drawings are exhibited.

The next, of 20*l*., for a dessert-stand, is given to Mr. R. Needham, of Heeley, for a weak design, consisting of three plates grouped round a flower-holder, exceeding the prescribed height, and more suitable for wrought-iron than silver. Mr. J. Holgate, of Chelsea, receives an extra prize, of similar value, for a heavy design, apparently studied from one of the bronze fire-dogs at the South Kensington Museum, and containing, among other things, three masks, nine figures with vegetable terminations, and three Cupids. The design containing four masks, four vegetable dragons, and four dolphins, by Mr. E. Thickett, of Heeley, which is unawarded, is pleasing and silvery, but too elaborate for cleaning.

Of tea-kettle designs, two are exhibited in competition for the 20*l*.; and Mr. T. Smith, of Coalbrookdale, is the fortunate winner. His nicely tinted drawing shows a badly-designed shape, overlaid with weak ornament, hanging on one pivot at each side, and hence, without that steadiness so necessary when setting boiling water, and having no non-conductor and no joint in the handle; the junction of the spout to the body, which is the *crux*, is slurred over and not shown. The whole is supported on a moulded architectural pedestal, imitated from masonry forms, and the article could not be made in silver for the specified sum, 60*l*.; but the judges seem to have overlooked these points. Mr. E. Thickett, whose design is much better in every way, shows a good shape, with ingenious fitting for the handle, judiciously applied ornamentation, and novel stand; but, as before, he has indulged too much in "properties," there being four sparrows pecking berries, two dragons observing a sunflower, one dragon flying after a curiously and wonderfully made man struggling amid some ornament, and four masks in the kettle; and two swans, eight dragons, and eight lions' heads in the stand.

For the prize of 20*l*. for an inkstand, two drawings are exhibited: the premiated one by Mr. M. Hayes, of Chelsea, a prettily-tinted one, showing an elaborately-moulded architectural pedestal, quite unsuitable for silverwork, with a ridiculously small trough for the pens, nothing suggestive of its use as an inkstand, and only two funny little vases to indicate the position of the ink-bottles. The unsuccessful design, by Mr. W. Wilson, of Ironbridge, shows a quantity of receding moulding and enrich-

ment beneath the stand, which would be quite wasted and invisible. Neither of these designs evinces a high degree of merit; but the latter is certainly more deserving than the former.

The salt-cellar prize has fallen to Mr. Needham, who has been equally fortunate in another competition. His design, with its four dolphins and three cherubs' heads, is commonplace, like those in second-rate electro-platers' pattern-books; and we fail to understand on what principle the judges have acted. The design by A. Winterbottom is far superior, both in technical and artistic detail; and it is, indeed, not only the best design for this object, but the best design in the whole collection. Mr. Winterbottom has shown in this, as also in his design for candlestick last year, the results of sound and careful training; and on each occasion has been passed over.

Mr. E. Thickett gains 10*l*. for his design for a small salt-cellar of a nice shape and silver character, though what his two sparrows, pecking at berries growing out of a pot, have to do with salt, is not clearly made out. In this competition Mr. M. Hayes is commended for a miniature sarcophagus, rather stone-like in general character.

The bowl design, shown in a nicely-tinted drawing, by Mr. G. F. Catchpole, of Westminster, with its four regulation masks, as before, calls for no comment.

Two prizes, of 15*l*. and 10*l*., were offered for a tankard design; and we should have expected something better than the three very poor objects which are hung up. The one by Mr. E. Hoyland (second premium) is the best: it shows a hunting scene, weakly designed and drawn, but on a nicely-profiled body, and a clever "stop" to the thumbpiece of lid; but how he makes 17½ oz. work out to 70*l*. is a puzzle,—perhaps 25*l*. would be nearer its value; and as 80*l*. was the limit of cost fixed by the Company, he might have designed a more sumptuous or a larger one. The first-prize design, by Mr. E. Jarratt, has niches, figures, &c., but the incongruity of niches in holding vessels like tankards appears not to have struck those having the duty of examining the designs; he values his work at 3*l*. 4*s*. per oz., which is an absurdly high price for silver.

After going through these designs, and comparing them with the electrotype reproductions exhibited in the Loan Court near at hand, we are profoundly disappointed. We commented last year\* on the want of originality and the borrowing of unsuitable architectural features; and suggested that competitors should aim more at the form and character specially suited to metal work. The present set of designs are, however, the worst that have been exhibited, so far as we remember, for their working-up of the dregs of by-gone styles, their aping of the depraved phases of the Renaissance, and their running in narrow grooves with a limited stock of ideas or "properties" used over and over again. Are we never to get rid of the masks, dolphins, vegetable monsters, and birds, lions' and rams' heads repeated *ad nauseam* without connected meaning or artistic fitness? The schools of design have been in existence thirty years. Are they responsible for this state of things? or may we surmise that better designs have been submitted, but have not been appreciated, and therefore have not been successful?

And yet, notwithstanding the ignorance of technical knowledge and of artistic feeling of fitness displayed, most of the handsome prizes offered by the Goldsmiths' Company have been awarded to these designs. We do not hear who are the judges in these competitions; at first impression, one might say that the proper persons to know about goldsmiths' work were the Goldsmiths' Company; and this would unquestionably be the case if this rich and generous guild were composed of those pursuing that art; but we are led to believe that, as with other of the City companies, the reverse is the case. We understand that a well-known sculptor has assisted with his advice; and, from his former technical experience, as shown in many groups of our race-plates in former years, and his acknowledged emolument in his art, he is the best man for the Model competition; but this does not provide for the careful consideration of the many prizes offered for Design.

If the exhibited designs are any type, or are to be taken as the best of those submitted, or of the work of our designers in general, we are not hopeful of English silverwork. If this be the



kind of design that the company delight to honour, then we say, better no competition and no prizes at all, than such indiscriminate giving away of money. This giving without knowledge, like similar aim-giving, can only have the effect of lowering the tone of silverwork throughout the country. Unless the artists have confidence in careful decision on the part of judges fitted for the post, they will either abstain in disgust, or work will be prepared in accordance with the calibre of their assessors; and the result will be, as in the present instance, an Exhibition of *Selected and Premiated Designs* made by clever draughtsmen without practical knowledge or artistic originality, which no silversmith of reputation would manufacture.

The duty of supervising the assay of plate and coinage is well performed by this old and much-respected company; but if this and other City companies wish to promote technical education with that fervid zeal which lately possessed them, they must take more trouble, and realise that mere voting of money without proper discrimination does more harm than good. We believe the Goldsmiths' Company have enabled several deserving young men to visit foreign parts, who, without their assistance could not have done so; we sympathise in their desire to raise the tone of silver design, a thing which is much wanted in this country; and as a contribution towards guiding it into a proper channel we would make the following suggestions:—

1. Let all competitions be limited to persons employed wholly or partially by *bona fide* silversmiths.
2. In addition to plaster models for figures, let wax-modelling for ornaments be rewarded. And in this, as in the competition for *repoussé* work, let the objects be such as may have a mercantile value afterwards, *i.e.*, such as may be made up into some saleable object.
3. The prizes for design might be offered as before; but in awarding them, more conscientious attention should be given in the adjudication to the technical capabilities of silver, and to the constructive necessities and artistic design of each object.
4. Copying the example of other guilds, the Goldsmiths might offer their livery for a treatise on some such subject as "The Technical Treatment of Silverwork in Design." No manual on this subject exists in the language, and thus they might be the means of eliciting an important and useful work, which might afterwards be published, and they would themselves derive the advantage of recruiting their ranks by the right kind of men,—men of proved ability and knowledge in the technical details of the "craft and mystery" which they exist to foster.
5. Most important: the judges for all these should be men well known, of wide culture and practical knowledge; their names should be published along with the conditions they had drawn up; the prizes should be awarded on their signed and published report; and the mottoes of all the works submitted in each competition should accompany it. If some idea like this were adopted, instead of the present unknown and irresponsible adjudication; we believe good would result, and the tone of design be correspondingly raised.

We hope that these annual generous offers of premiums may really help forward education, and we heartily wish the company success in their efforts.

#### THE FORCE OF CONTRACTS.

In the mercantile world the number of disputes which have been caused between buyers and sellers and merchants and brokers, by the difficulty of interpreting contracts, which have been reduced to so small a space as almost to be unintelligible, or susceptible of different meanings, is quite untold. Not a few disputes, however, arise between builders and employers from a somewhat similar reason, namely, the inaccuracy of contracts which have been entered into. This is most commonly the case in connection with comparatively small jobs, when often an architect has not been employed. But the amount of money wasted during the year by employers and builders because their contracts are not clearly expressed, is very considerable. Very often no dispute would arise if builders or employers would put the contract into plain homely expressions of their own; but, instead, they adopt an abbreviated version of the more lengthy forms of contract, or else take some of the expressions from these contracts

without due consideration of the context. The result is that disputes arise, and then, when the contract is referred to with some minuteness, it is found to be practically unintelligible, and the result is the loss of money both by employers and employed. However small the work to be done may be, money expended on having a clear agreement drawn up will be well spent, and those who may not happen to have suffered from short or loose contracts will do well to remember that past immunity from disputes is no guarantee that trouble may not arise over some future undertaking. Many of our readers may say to themselves that this is unnecessary advice, but experience unfortunately shows that, though it may be very obvious and simple, it is by no means universally followed.

But there is another point in regard to contracts which cannot be too constantly insisted upon; and that is, that when once a contract has been entered into, nothing but a distinctly-proved alteration by the parties to it will obviate the necessity for abiding by its terms. The most common example of the habit which exists of not abiding by the terms of contract is that of the execution of extra work without written orders from the architect or his employer. No doubt, although there may be a provision in the contract that extras shall not be paid for without a written order, additions are constantly ordered by architects and employers, and executed by builders, without written orders, and are in many cases paid for without demur. But still, no contractor is safe in executing extras without these orders, and a time is almost sure to come when he will find that he has done work without orders once too often. And we are bound to say that we consider architects are much too lax in this respect, and have too little regard for the sanctity of contracts. They are of a superior class to the general body of builders, and are, through their clerks of the works, constantly in attendance on the spot; and the builder, if he receives a verbal order from the architect to do a certain extra piece of work, is naturally inclined to set about it without delay, and without, perhaps, somewhat annoying the architect by asking for a written order. But experience again shows that this non-adherence to the words and spirit of the contract is the cause of endless disputes or of great waste of money, all caused by the laxity of architects and builders, and by a forgetfulness that terms in a contract must be adhered to. No doubt, also, the fact that for a number of years it has been a recognised legal principle that the existence of a certificate of the architect which deals with work executed without a written order obviates any objection which may be raised in consequence of the absence of written orders, has fostered this neglect of the terms of contracts. But the existence of this principle is only a partial safeguard, and it is an every-day occurrence for the absence of written orders to be relied on by employers whose architects' certificates have not covered the whole amount claimed for extra work. Again, if work is to be done for a fixed sum, it cannot be charged for by the builder simply as measured work unless the employer and himself have come to a clear and definite agreement on this point, and that instead of a fixed sum the builder shall be paid at a certain rate for the amount of work executed by him. These kind of alterations, or supposed alterations, of contracts are, however, far less common than the execution of extras without written orders, but both are, as a rule, liable to inflict injury on builders, who forget that long bills sometimes prove too much for the most good-natured employer, and that no amount of habit or practice will generally be regarded by judges as a reason for not adhering to the terms of a written contract.

#### CLOSING OF UNSAFE THEATRES.

The results of the Ring Theatre fire still continue to be manifested in the news respecting Continental theatres. There is no large city in Germany or Austria where the theatres have not been thoroughly examined with a view to ascertain their internal arrangements, more particularly the measures of precaution adopted against danger from fire or sudden panic. Not a few theatres have been closed by the authorities on the ground of serious deficiencies in these matters. Thus, during the past week it has been announced that one theatre in Cracow, and no fewer than three theatres in Milan, have been closed by the authorities for deficiencies of the nature indicated.

#### A PROPOSED ROYAL COLLEGE OF MUSIC.

It is hardly going out of the way, in a journal devoted to the interests of art, to say a word in recommendation of the project to found a Royal College of Music in England for affording gratuitous education in the art, which has received the public support of more than one member of the Royal Family. The proposition is, in fact, connected more or less with the general theory of artistic education in this country, for it amounts simply to a proposal to place music on the same footing as that on which painting and sculpture are now placed by the existence of the Royal Academy, with its free education for students in those arts. There is in existence, as all know, an institution with the title of "Royal Academy of Music" (which is probably the reason why the term "academy" has not been used for the proposed new college), which has done and is doing good work; and there is the more recently-formed National School at Kensington, which has an able staff of professors, and has turned out at least one brilliant student. Both these, however, are places where education must be paid for. There exists no institution in England where a boy or a girl who has exhibited musical talent, but whose parents have no money to spare on an expensive education, can be educated freely, as an embryo painter or sculptor would be at the Royal Academy. It is hardly possible to assign any reason why the arts of painting and sculpture should have this free help, and why that of music should be left out in the cold. It is certainly much to be wished that the idea had been started and practically taken up before the founding of the Kensington Training School, on which no inconsiderable amount of private munificence has been expended, which, if the new and wider scheme is really carried out, must now be regarded as practically wasted. But this, though to be regretted, cannot be a sufficient reason for opposing the larger and more publicly-useful scheme.

We have before us, in pamphlet form, the three addresses delivered on the subject, at a meeting in Manchester, on December the 12th of last year, by the Duke of Edinburgh, the Duke of Albany and Prince Christian respectively.\* They will be found well worth perusal by those interested in the subject. We will only here comment on two points mentioned in them. The Duke of Edinburgh drew attention to this point, which is often overlooked, that for practical reasons the musical education of a number of pupils cannot be carried on without much greater expense in the way of accommodation than is necessary to instruct a similar number of boys and girls in ordinary education. Great part of a musical education means learning to play on instruments,—what is commonly termed "practising"; and this means separate apartments, so that it is impossible to concentrate pupils in one or two rooms, as the same number can be concentrated in a school for silent studies, or in the life school of an Academy of Painting. There is thus even an extra reason for this art receiving the support of a free school. In many cases, too, the purchase of the instruments themselves is beyond the means of some who might turn out brilliant exponents and exponents of music if they could get the means wherewith to train and develop their natural talents.

The other point we will just touch upon is the remark of the Duke of Albany in regard to the frequent evidence furnished by our English literature, especially of the Elizabethan era, that, as far as music had progressed, England was then really a very musical nation,—far more so comparatively than now. This is more especially shown in the constant reference, in Shakespeare, for example, to part-singing as an ordinary recreation of friends at a social gathering, and in which every educated man was supposed to be competent to take a part. In the present day such an enjoyment is only secured by a careful pre-arrangement of the party so as to secure the presence of some of the small minority who can read music sufficiently well to "bear a part," as the old phrase was.

In lieu of this, to some extent, we have a good deal of pianoforte playing, and it is supposed to be part of a young lady's education to play more or less; but this does not give the same evidence of musical knowledge. Many a girl can play a brilliant pianoforte piece who

\* Published by John Murray, Albemarle-street.



could not be trusted to sing a simple melody correctly at sight, even alone, much less in concert with others singing different melodies. This fact is suggestive: it would be out of our province, however, to enlarge upon it.

By way of bringing the subject directly within our own scope, we may suggest, in conclusion, that if the realisation of the proposed Royal College of Music results, as it should do, in the provision of a new building for the prosecution of musical study on an extended scale, there is then a very interesting practical problem for an architect to solve,—viz., how to arrange for a number of students within a reasonable space, in such a manner that each should have sufficient isolation to enable him or her to pursue the daily practice of an instrument without either interfering with others or being interfered with by them. This has never, we believe, been fully accomplished in any musical school as yet.

#### STAINED GLASS WINDOWS, AS THEY WERE, ARE, AND SHOULD BE.

This was the title of a paper read by Mr. Lewis Foreman Day before the Society of Arts, on Wednesday evening last, Mr. George Godwin in the chair. Tracing briefly the history of stained glass from remote times, Mr. Day sketched the characteristics of "early glass," "Decorated," "Perpendicular," and that of the Revival. We print the concluding portion of his address, as dealing more immediately with the present time:—After the middle of the seventeenth century, good glass-painting may be said scarcely to occur, excepting certain Swiss domestic panels, to which I have not time to refer. It became more and more like abortive picture painting, and less and less like glass. The difficulty of leading increased with increasing desire for pictorial results; and, in despair, I suppose, of unravelling the problem, they cut through it brutally, and leaped up the pictures in big square panes of glass, without regard to its details at all. Examples of seventeenth-century glass are not far to seek, in which most delicately-painted hands and faces are cut straight through by lead lines. This is a reduction of the art to absurdity. It is clear that either all delicacy of painting was superfluous, or it deserved more tender treatment than that. No better illustration of the insufficiency of merely pictorial art in glass could be given than is afforded by the windows in the ante-chapel of New College, Oxford. Here are seven huge windows, filled with the original early Perpendicular glass, and one large window by Sir Joshua Reynolds.

Now, the glass-painters of 1386, or thereabouts, were not Sir Joshuas, and certainly the painters of these old windows at New College were immeasurably inferior to him in all that goes to make a picture. I have said that before the fifteenth century the figures in glass were seldom much to boast of as drawings, but here they are even more monstrous than usual. The heads are, in some cases, twice the size of nature, and the feet and hands are flattened out more like botanical specimens that have been pressed in a book than anything in human anatomy. There is no grace, and little dignity, about the individual figures, and, perhaps, there is not a single form that could be called beautiful. On the other hand, the forms that Reynolds drew could scarcely fail to be refined and graceful, and though in the upper part of his window (which represents the Adoration) he is not at his best, some of the Virtues which occupy the lower part of it exhibit all the tenderness and grace of the master; and yet his window is as conspicuous by its failure as the Gothic windows are successful. Why is this? Simply because the designer of the older windows was a glass-painter, and knew what he was about, whilst the first president was not a glass-painter, and did not. He was altogether at a disadvantage with this great window-space before him. He neither realised the difficulties nor knew the resources of the art in which he was dabbling, and in the competition with men who were his inferiors in all but the fact that they knew their trade, he was nowhere. He attempted, very naturally, what was easy to him in oil, impracticable in glass, ignoring all the while what might have been done; and, with all his labour, and the skilful execution of the glass by Jervais (who, by the way, was a china-painter, and went to work as if he were painting on opaque porcelain instead of glass), the effect is quite feeble. Admitting

all the merit of individual figures, the fact remains that the window has no more brilliancy or beauty of colour than a big transparency. It might just as well have been painted on linen.

The "Virtues" (even Horace Walpole called them Sir Joshua's washy "Virtues") are not nearly large enough in treatment for the spaces which they fill (or should fill, for they do not do it); a mass of heavy, opaque, colourless, and uninteresting background stares you in the face, or if the sun shines very brightly, you see instead a mass of foxy-brown; and in the upper half of the window this preponderance of heavy shadow is the chief thing noticeable. Add to this that the enamel employed in order to obtain this objectionable obscurity is already peeling off in flakes, leaving patches of dazzlingly pure white where they have least business to occur, and you have a picture of a complete fiasco. Now, in the older glass, in spite of the most rudimentary forms of figure-drawing, the artist has known how to turn the material and its resources to full account. There is a certain largeness in his treatment of the figures that gives his saints a dignity the "Virtues" lack. Deep rich colour is introduced in plenty, and wonderful skill is shown in the way in which it is introduced. Colour is balanced against white, and white against colour, with the dexterity of an experienced craftsman. He has availed himself to the utmost of the beauty of the material, never obscuring it by heavy paint. He has striven for colour, which he could get, rather than form, which was beyond his reach; and he justifies all his faults, whether of taste or drawing, by the success of his work on glass. It fits its place, and adds to the impressiveness of the architecture: the effect is sufficient,—what more can you ask? The marvel is, how Sir Joshua, in sight of these grand windows, could have allowed his own work to be put up,—or, at least, to remain there. But that is a wonder that occurs nearly every time one sees a modern window side by side with an old one. How could they, with that before them? All we seem able to learn from old work is to caricature its forms: we miss its spirit and its colour. It will not be worth while to mention instances of this miserable modern mock Mediaevalism,—they are only too abundant. But I must not omit to allude to another kind of modern glass which errs in the opposite direction, though not exactly in that of Sir Joshua's unfortunate effort. I mean what is known as Munich glass. The revival of glass-painting fell, in Germany, into the hands of artists; of draughtsmen, at all events, and men, moreover, of some thought and culture. It was not likely that men of the calibre of Cornelius would be led away into the affectation of crude thirteenth-century draughtsmanship. The rudeness of early Gothic art revolted them, and they rejected it altogether. With the chaff they threw away much wheat, no doubt; but, whatever their shortcomings in art, they knew how to draw, and they could not bring themselves to pretend incompetence. They knew something of anatomy, and they could not lie under their learning; so they set themselves to draw their best for glass, and some of their designs are worthy of all respect. Unfortunately, these men knew as little about glass as Reynolds did, and they based their design accordingly on the art in which they had some experience, viz., fresco. It might have been anticipated that, since they worked on the lines of fresco, and Sir Joshua on those of oil painting, their work would have been as far superior to his as fresco is more nearly allied to glass-painting than oil painting is. But it must be remembered that the Germans (of the last generation, at all events) were not colourists. It is much if their paintings are respectable in colour, and the strong tones of glass were altogether too much for them. Whilst Sir Joshua lost all the translucency of glass in shadows (which in his pictures he knew how to make so transparent), the men of Munich contrived to lose all glassiness in a glare, the crudest, crassest colour. The tints they employed were as flat as those they had used, with more exorse, in fresco. They were as even as manufacture could make them: bright, without brilliancy,—gandy, without richness. The windows had all the appearance of cheap coloured lithographs, magnified. You may say that it is, after all, a question of individual preference, whether we like best form or colour. But remember, colour is the only excuse for stained glass. Glass affords opportunities for a brilliancy of colour which no other medium

offers, whereas it does not lend itself at all to refinement of form; and if form is what is wanted, any other medium would do, not only as well, but better than glass. There are some important Munich windows in Glasgow Cathedral, which I have not seen, and some in the cathedral at Aix-la-Chapelle, which I have twice seen, and have no desire to see again. There are some failures in our own St. Paul's, too. But if you wish to compare pretensions modern Munich with good old German glass, you have only to stand in the nave of Cologne Cathedral, and look from one side to the other. The contrast between the two is all the greater that there is similarity of scale and general design between them. The old examples, on the left as you face the choir, have unfortunately suffered restoration, and some of their beauty seems to me to have been restored away since I saw them some years ago. They are not perfect. They are not equal in colour to the best glass at Rouen, nor in drawing to that of Brussels; but they combine something of the glowing colour of the one with no little of the grand design of the other; and, for all their restoration, they remain magnificent windows, among the finest examples of late Gothic glass-painting extant.

To turn from these to the windows opposite, is, without metaphor, a shock to the eyes such as one suffers sometimes when, on a moonlight night, one finds oneself suddenly within the radius of the naked gas-jets of a butcher's shop. The merits of Munich glass are as obvious as the conveniences of gas-light, but its demerits are much more glaring, and there are no practical advantages to make amends as in the case of gas.

#### Revival in England.

The revival of glass-painting in England, as in Germany, is of comparatively recent date, and may be almost within the memory of some of my hearers.

It was as a manufacture rather than as an art that it began to lift up its head. There was in England no King Ludwig of Bavaria to patronise it. No famous artist patted it on the back. But the Gothic revival was a proof that there were plenty of persons interested in ecclesiastical art. Clergymen naturally vied one with another in their desire to embellish their churches; rich donors were not wanting, architects were nothing loth to bestir themselves in the matter, and, of course, manufacturers were forthcoming who were prepared to undertake anything and everything in the way of stained glass, if only there was a fair margin of profit attached to it. Happily, among those manufacturers, some were artists; happily, too, they took up stained glass before they had made their names; they identified themselves, therefore, thoroughly with glass-painting, and won a well-merited reputation in connexion with it. The element of trade brought with it, as always, an influence for good and evil. For good, in that it encouraged the art, and made it possible for men to live by it; for evil, inasmuch as the consideration as to what would pay prevailed too often over the knowledge of what was best. An artist's true success is when his conscience whispers to him that it is well done. Commercial success, on the other hand, implies, in many instances, an increasing deafness to the voice that tells us what is right. Men are but men; and it is hard to go on striving after what you know to be best, when there is no appreciation, and no fair price for it; and all the while there is clamorous demand, and lavish payment offered, for what you could do so easily, though you feel that it is not worth doing. So, those who were artists yielded, and those who were not, knew no better; and most of our fine churches have been vulgarised, more or less, by windows that are as tawdry in their way as the tawdry decorations of wax and tinsel, and paper flowers, that desecrate the altars in the churches abroad.

But with all this, it may truly be said that modern English glass-painting has progressed. It was based from the first upon a truer appreciation of the principles applicable to glass-painting, than any foreign glass-painters have attained to, and the best of our windows want only the effect of age upon them to be referred to by the coming generations as fine examples of old work. There is not the least doubt in the world that much of the charm of old glass is due to the effect of age upon it. If you take the trouble to examine any old glass closely, you will find that much of it is, through partial



discolouration, pitted and speckled all over with irregular little holes, which render the surface quite rough, and this uneven surface not only causes variety in the depth of the colour according to the thickness or thinness of the glass that is left, but by refracting the light that is transmitted through it, gives to the glass a quality which no even material could possibly possess. In comparing modern windows, then, with old, we must not forget what is due to time. There is a popular idea that the art of making ruby and other glass has been lost. That is a fable. The whole art of glass-painting was lost, if you like, or, more properly speaking, left in abeyance, for something like a couple of centuries; but glass is now manufactured in England that is all that the artist could desire; and if modern English glass-painting is not all that it might be, it is less the fault of the glass-painters than of the public, who prefer to pay a price at which moderate merchandise can be turned out, rather than a sum which would remunerate an able artist at the rate of art. The old glass we admire was designed, and often painted, by men who were among the foremost artists of their day. The great part of ours is manufactured at a price; and if, sometimes, the manufacturer gets a good price for it, the draughtsman may think himself happy if he earns 6s. a week, whilst the painter earns much less. Considering the present prices paid for pictures, even of the second and third rank, it is not wonderful that Sir Frederick Leighton and all the forty do not rush into glass-painting. The only artist of independent note as a painter, who has devoted himself to any extent to glass-painting, is Mr. Barne Jones, and his glass is worthy to be named with the best old glass. It proves him master of his material as well as of colour. It is unlike any old glass that ever was done, but none the less it obeys the principle followed in old work, though it borrows none of its forms. In attempting to fix the position of glass-painting in England at this date, I should say that we have men among us who could perhaps produce windows as fine as anything that has been done; but until artists have been tempted to take up glass-painting as they do other painting, executing their own work, or seeing it executed under their own supervision, and receiving payment for it at the rate of art, good work must continue to be scarce among us. Glass-painting is not easier than painting on canvas or paper,—that it should be thought so much less valuable. The mediocrity of so much modern glass is due to the fact not that we could not do much better, but that we are not encouraged to and cannot afford to do our best. In tracing thus far the history of glass-painting, from what it was to what it is, I have forestalled what I had to say concerning what it ought to be. I think I have already suggested, by implication at least, what stained glass should be. It should be on a level with the art of our time; but first, and before all things, it should be glass. That means to say, that the artist should have studied old glass, as the painter studies the old masters. He should know what was done in the Middle Ages and during the Renaissance, and how and why it was done; but he should not stop there. He should beware when he digs among the ruins of the past, lest any speck of its deadly dust should get into his eyes and blind him to the possibilities of the future. The archaeologist is often so bigoted, the glass-painter so mechanical, the artist so ignorant of glass. We want the three fused into one,—a man who is at once familiar with old work, master of his craft, and an accomplished artist,—a man too well versed in the art of the past to ignore it, too skilful to blunder, too conscious of his own power to be the slave of his knowledge,—a man who is experimenting always, but basing his experiments on experience, and proving his deep reverence for the great men gone before, by daring, as they dared, to be himself.

The Chairman said he felt sure they agreed with him in thinking that Mr. Day had given them an eloquent and lucid sketch of the history of stained glass, and of the characteristics that distinguished the works of its various periods. He had also taken a broad and fair view of the two distinct principles on which stained glass was produced, and, while rightly insisting that it was a window and not a picture that was required, had admitted the beauty to be found in many windows of the Renaissance period, in which pictorial art had been carried much farther than in the Medieval glass. Mr. Day's

account of existing windows had recalled delightful recollections of visits in early days to the glorious "glasses" in the cathedrals of Chartres, Strasbourg, Bourges, our own Canterbury, and, he would add, Fairford, notwithstanding the lecturer's slightly depreciatory opinion of the remarkable series of windows there, which he advised all, when an opportunity offered, to visit. The effect produced by some windows was never forgotten. He had before his eyes then, for example, a wonderful piece of colour at the east end of Milan Cathedral as seen, though many years had passed since from the west end,—too far to distinguish forms. In stained-glass, colour was the prime element. Mr. Day had expressed pretty plainly his opinion of the want of merit in much modern work. He (the speaker) was inclined to go much further. The amount of money which had been spent in this country on utterly worthless rubbish was enormous and greatly to be deplored. The large majority of windows, specimens of bad drawing and worse colour, repetitions *ad nauseum* of a few subjects, could give no pleasure to any cultivated observer, and would one day be removed as public injuries. He was disposed to think that 50,000*l.* a year would not be an excessive estimate of the amount which was thus spent, and if we multiplied this by say thirty years, during which it had been going on, we should have a million and a half of money as the total. He fully admitted the excellence and beauty of some of the work done, and that it would be finer still but for the unwillingness of the public to pay for art. They would pay for glass, but not for art. If they wanted art they must have artists, and if they had artists, artists must be paid. Moreover, colourists were not too plentiful; colourists, like poets, were not made, but born. He hoped something might result from that evening's proceedings. The Society of Arts had of late years rather neglected the fine arts, though they had attended right well to science and commerce. It might make up for lost time in this respect, and obtain condonation, if it originated a movement tending to bring about an improvement in stained-glass windows. Mr. Trueman Wood, secretary, combated, as in duty bound, the last observations of the chairman, and a discussion followed, in which Mr. Holliday, Mr. Christopher Cooke, Mr. Pfouder, Mr. Liggins, and others, took part. A warm vote of thanks to Mr. Day closed the proceedings.

#### INCOMBUSTIBLE MATERIALS FOR BUILDINGS.\*

THE last city conflagration at Quebec reminds us of the thought recurring at every great fire destroying an enormous mass of property, viz., Why do we not build unflammable houses of all kinds? or, why use any timber or any combustible materials in building? Timber decays, if it escapes fire, and must be renewed on an average under fifty years old. If all the timber work of a house was valued, and all the steel of iron and metal required to be substituted instead to give equal strength, the difference of expense in some things will be found in favour of the substitute, and the average would be more than a turn in favour of rolled iron and cast-iron work,—a great proportion requiring only what is called old iron, which sells at from 50 to 70 per cent. under the price of new iron, and has to undergo waste and expense in being re-cast and forged for sale in all shapes. If that average cost per cube of 1,000 feet is even a turn against iron work, the consideration of durability alters the case still in favour of the incombustible work. But it may be said, how can a house or store full of very inflammable goods be a bit safer from being built of stone, brick, cement, concrete, iron, brass, zinc, copper, lead, slates, tiles, and glass, if those combustible goods take fire by accident, or development of coal-gas, or leakage of gas-pipes? In such cases, excepting all explosive matters, a fire may burn itself out,—if the iron door is shut and kept cool,—if necessary; and, clearly, in such instances a very short time would make enough of "fire damp" to extinguish the fire before it had taken such head as to melt a cast-iron door of the lightest possible casting. Certainly such a building would be fire-proof against all but the condensation of spirits, paraffin, petrol-um, and turpentine, where heat sufficient to pulverise brick

and concrete might be produced by the burning of large quantities of those exceptional things, which are explosives in a great degree.

For walling, the Portland cement concrete, made of 1 part cement to 4 parts washed gravel, is nearly everywhere cheaper than brickwork, and often cheaper than stonework, at half the thickness stronger than stone, and, in case of fire, will suffer less than stone and lime mortar work, and very much less than brickwork in lime mortar. The cost of walling may, therefore, be excluded as one of the data required to make a comparative estimate, but for the increase of durability which gives the concrete the preference at equal prices. Well made and well handled, with the least possible stirring after wetting, the two materials mixed dry, the gravel concrete makes better structure than most of our building-stones, particularly the sandstone of all colours.

Very good attempts have been made with Bangor and Valencia flags to make fireproof bowing-stores in Bristol, using slabs of 12 ft. and 15 ft. long by 6 ft. or 7 ft. wide, and 3 in. thick, laid on walls and metal girders under the ends of those lengths, after testing the strength of the slabs to more load than they will ever have to bear. But such floors are very expensive, and the bare slabs exposed to intense heat will suffer more than a concrete floor. They must collapse when the metal posts supporting them are melted, unless the pillars are cased in concrete. All condemned rails sold by the railway companies, for one-half the price of rolled iron, make very good joists for spans not over 14 ft., spaced 30 in. apart centre to centre. Flat arches of small flat stones, 6 in. deep, resting on 78 lb. per yard old rails set across the roadway, and grouted with fine concrete, and flushed over with it, form the roadways of several iron bridges in the County Kerry, and have been laid for less than a wooden floor with 10 by 2 in. joists and 1 in. boards. A fireproof floor was put in the Bridewell at Truro, over the prisoners' cells, in this way, for 45*s.* per square of 100 ft., which is about the same as timber flooring of the scantlings described. In wider spans those rails can be supplemented by midway girders or plain ribches of rolled iron under, so as to make the floor perfectly rigid. Such a floor would never fail to keep down any fire underneath it. For dwelling-houses, ceilings could be worked out in plaster more firmly than on laths of 1 in. thick.

The roofs would afford most saving on the comparative estimates. The strength of the modern iron roof in angle and T iron bars and beams is to be had for less money than what timber of the usual sizes will cost. Galvanised riband iron, on frames 4 ft. apart, pierced for copper fastenings or iron rivets, will cost very little more than wooden sawed laths. Cast-iron gutters can be had for less than half the price of 7 lb. sheet lead for both flat gutters and valleys. Slates drilled to be fastened by nails can be tied on to the laths of riband iron with copper wire as cheaply as with nails.

Cement concrete roofs on centring made to a catenary curve inverted may be relied on to stand but 2½ in. thick, if the abutments are secured from lateral thrust by a few tie-bars across the span, mounted on washer-plates outside and screwed tight, or tightened by heat and cooling. It may require a rise of arch of one-fifth span, and a thin coat of pure cement, as a waterproofing, which is further secured by a couple of coats of coal tar. Mr. W. T. Crosbie, of Ardfert, has built a good many roofs of this material, but in elliptic arches very flat, and, therefore, requiring more than double the depth of concrete, and they have cost him 5*s.* per square yard; so that the catenary curve may be had for 3*s.*, which is much less than any slate and timber roof can be put up for nowadays.

Interior fittings of doors and window-frames with the doors and sashes, it can be easily understood, may be had in metal and black iron without trouble or expense greater than wood, but cheaper, from being everlasting.

It is to be expected that the objections will be raised on account of iron-work contracting and expanding with cold and heat, which has given some trouble in making smooth joints between long pieces of railway-iron. This may be avoided by using cast iron where long spans are to be set up, such as tie-bars to wide and flat roofs, where the expansion would be very small. Metal window-sashes are, on this account, liable to be found difficult to stanch against wind and water. To obviate this I have

\* From a paper by Mr. Henry Stokes, read before the Institution of Civil Engineers of Ireland on Wednesday last.



used a fillet of caoutchouc between the glass and the metal to be soldered on to the iron and glass by a hot-edged tool, which will give sufficient room for contraction in the elasticity of the indiarubber to prevent the glass being broken and make a staunch joint always. In a continued row of such houses as I have tried to describe, no fire could spread to any considerable extent, even if extra inflammable goods took fire, and this last advantage in itself is, or would be, an enormous gain. The only drawback would be that the carpenter's occupation would be gone, or almost gone.

#### CONTINENTAL GATHERINGS.

In many quarters the announcement made within a few days past by the French Minister of Fine Arts respecting the foundation of an annual exhibition of the decorative arts will be received with pleasure. This exhibition will be held yearly, at the same time and in the same building as the *Salon*, of which, in fact, it will form a department. Here, at length, is settled the long-debated question as to one of the duties of an Academy of the Fine Arts. It is an old complaint that our own Academy has neglected from the first the minor but none the less dependent and kindred branches of the arts; in its original constitution it will be found to have included the representatives of more than one art that, now overlooked, has almost ceased to exist; the gem and seal engravers may be mentioned among these. The French Exhibition of the Decorative Arts is, however, not exactly connected with the *Salon*; it is directed by the Society of the "Union Centrale" in conjunction with the authorities of the Museum of the Decorative Arts. The *Journal Officiel* of a few days since published the regulations of the forthcoming Exhibition, in which it is to be hoped England will be well represented. The Exhibition, to be open from the 1st of May to the 15th of July, in the Palais de l'Industrie, is to comprise ten branches of the decorative arts, decorative architecture, sculpture and painting, metal work in gold, &c.; enamels, glass, tiansu, &c.; printing and books, as shown by compositions; drawings, models, and specimens. All contributions are to be sent in before the 15th of March next,\* and accompanied by the necessary information for insertion in the catalogue. We may draw the attention of those readers interested in the subject to the fact that all works must be sent in from abroad through an agent authorised by the sender; respecting copyright, it may be remarked that no work will be reproduced without the express permission of the author.

We may look forward with interest to this novel feature of the forthcoming Paris season. France is at length waking up to the fact that she does not stand alone in the artistic market. It is but a few days since, we learn, that a commission entrusted with an inquiry into the condition of the industrial arts in France, examined a number of representatives of the furniture, kindred trades, wood-carving, and carriage-building. The unanimous opinion was, that foreign competition was daily driving out French products from the markets of the world. It will be heard with pleasure on this side of the Channel by all interested in the progress of our art-manufactures that our furniture trade is now in so flourishing a condition that French manufacturers actually send to us for their patterns. This fact, stated before the Commission, we have the utmost satisfaction in laying before our readers. The result of the inquiry instituted by the French Commission to which we have referred, tends to show that it is alone by means of technical and art schools that France can hope to retain any position in the productive markets of the world. A worthy example of the value of private initiative, in a country where everything is left to Government control, was brought before the Commission in the case of the technical school formed in the Rue de la Roquette,—a neighbourhood in Paris the reputation of which is little better than that of Whitechapel, Seven Dials, or Five Points,—a school which, the creation of a poor workman, M. Blanchard, is now, we learn, supported by a municipal subsidy.

M. Havard, the delightful writer who has told us so much about Holland, about Delft pottery, and the Dutch painters, has been recently discoursing eloquently and amusingly on a subject

which, with our neighbours quite as much as with ourselves, is now a ruling topic of the day, household decoration. Apropos of employing architects, M. Havard, in relating the experiences of every one who has gone through the pleasurable excitement of home decoration, states a fact that is, we believe, not generally known, relating to that sorest of all points between employer and employed, the question of exorbitant estimates. It would appear to be a very old-world trouble. In Ephesus, in Classic times, it was customary on the conclusion of a contract, and the statement by the architect of the cost of his work, for him to deposit as surety his worldly goods or their value, in the hands of the magistrates. On the termination of the work any excesses, where not amply explained, were paid out of the architect's property. From a professional point of view this seems rather an arbitrary manner of tying a man down to his opinion. That worldly-wise architectural adviser, Vitruvius, it seems, however, approved of this method. "How desirable it would be," he remarks, "that the Romans should have such a law, which would thus check the disorders attendant on ignorance. Fathers of families would not find themselves launched into terrible expense; buildings would be really finished for the sums agreed, or a little above; but when the expense is doubtful, all confidence is lost, the owner sees himself ruined, he is discouraged, and he abandons the whole."

The question of protection against fire is one that is always "on the board,"—or cloth, to translate correctly that most ill-used expression, *sur le tapis*. It would appear from accounts which have reached us, that Frankfort-on-the-Main is in possession of a Fire Brigade which affords an admirable model to other cities. The method adopted (one of complete telegraphic communication) allows of the existence of a fire, and the spot at which it has broken out, being immediately made known to the central station; it allows also of all the police, and *employés* of the gas and water companies, whose presence may be necessary, being duly warned, and, in case of great fires the volunteer fire-brigade. By means of this system the night watchers posted on two high towers overlooking the city, can warn the brigade of any fire that may be noticed for miles round; the central station can use the same wires to transmit its orders to the most distant stations, and give, in case of need, the signal to sound the fire-bell for the volunteers. A series of wires runs to each part of the town, no house being more than 500 to 600 yards distant from some fire-signal. These are placed, if possible, in public buildings, barracks, chemists' shop, hotels, wherever, in fact, there is a night-porter. Private individuals who may desire it are provided with a fire-signal, on condition, however, that they open at all hours to the ring of the fire-bell, the existence of which is duly labelled on the outside of the house. In addition to this, at certain points notices state where the nearest signal is to be found, just as with us the position of the fire-plug is stated from distance to distance. From each signal the notice given finds its way to the central station, and help is immediately sent; the person waits till the arrival of an official, whom he directs to the fire. The apparatus is extremely simple, being entirely on the Morse system. Incidentally it may be mentioned that the wires being in connexion with all the police-stations and municipal offices, are largely used for the transmission of business despatches unconnected with the fire-brigade; all the wires are laid underground, the possibility of accidents thus being lessened. It is but a short time since, it will be remembered, that a case was reported of a fire-escape in an English provincial town brushing down on its hurried way a number of aerial telegraph-wires. Within a few years past much has been done in London in the direction followed by the Frankfort fire-brigade; indeed, it is alone the size of our metropolis that prevents the system being almost perfected. It is from America that we have still much to learn on this point.

Since we have referred to America, it may not be uninteresting to some of our readers to learn that the colossal statue of "Liberty" to be erected in a year or so in the Bay of New York, is rapidly approaching completion. Some time since at a ceremonious meeting in Paris the foundry of Messrs. Gaget, Ganthier, & Cie., Mr. Martin, the American Minister, drove home the first rivet attaching the statue to its base. This was some months ago, and since then the work has been steadily progressing. At a more

recent meeting held in New York, a subscription was opened to defray the expenses of the pedestal and the erection of the statue; the cost is estimated at a quarter of a million sterling. Some idea of the size of the work may be formed when we state that from the head to the foot the statue will measure about 105 ft., not reckoning the up-stretched arm holding the torch, which is about another 40 ft. above the head; with the stone pedestal, some 82 ft., we reach a total height of 227 ft. The interior ironwork necessary to hold up this colossal work, weighs alone over 90 tons; the copper plates are over 30 tons. Visitors to the Paris Exhibition of 1878 will doubtless remember the completed head of M. Bartholdi's statue, which formed in the Gardens of the Champ de Mars such a conspicuous feature. The expenses of the statue having been already subscribed, the work has been since that time steadily progressing, and it is fully expected that in 1883 the colossus will be erected on Bedloe Island.

#### WOOD-PAVING IN LONDON.

WOOD-PAVING is being laid extensively in London,—some good, some indifferent, and some bad. A few remarks on the various modes adopted and the results under wear may therefore probably be useful. In the first place, it may be stated that there are several wood-paving companies working according to patents taken out by them, or which have been acquired. A description of these patents will not, however, be entered into, but the writer's ideas of what constitutes a badly-wearing wooden pavement, and what a good-wearing wooden pavement, will be given.

1. As to foundations. Sand, layers of boards, or any other similar form of loose foundation, should be rejected.
2. Open-jointed wood-paving, however the open joints be filled, as with asphalt, with gravel, or with Portland cement, or any combination of these materials, will constitute a swiftly-wearing surface, and the wider the joints the more rapid will be the wear and disintegration of the blocks of wood.
3. Hard woods will not make the best pavement, as the surfaces will wear slippery, and jar the wheels passing over in proportion to the swiftness of the traffic and the hardness and roughness of the surface.

The requisites for a good form of wood-pavement are,—

1. An absolutely sound and true cement concrete foundation, capable of resisting the ramming strokes and vibrations of the wheel-traffic moving over the surface.
2. A thick layer of tar-felt to be laid over the concrete when fully hardened, upon which the wooden blocks are to be bedded, and also a layer of similar felt betwixt the paving-blocks, which must be set close-jointed.
3. The blocks to be sound soft pine, free from sap, dead knots, and shakes. If creosoted, all the better.

The wear and tear upon street surface along the main lines in London is something tremendous, and it is this almost uncessing quick traffic which wears street-pavements most; such traffic, for instance, as by spring-wans, omnibuses, carriages, and cabs. Any wheels moving at a rate of six miles per hour and upwards, jump and ram, in proportion to the speed and roughness of the surfaces; the heaviest and swiftest moving loads doing most injury. A locomotive wheel of steel, moving upon a steel rail, jumps in proportion to the velocity of the train: hence express trains wear rail-roads more, in proportion to weight carried or moved, than heavier luggage-trains do. A wheel in rapid motion strikes as a sledge-hammer strikes, and the blow is in proportion to the velocity. In the first days of railways these facts were not suspected, hence a tolerable bunch of constructive blunders, such as stone blocks on hard bottoms in outcrops, timber piles under rail-joints in embankments, and solid sleeper-walls in embankments. Railway engineers now strive for an elastic foundation, such as is given by a use of sand or gravel for ballast, and wood for cross-sleepers. If steel or wrought-iron be used for sleepers, elasticity will also be sought for.

But to return to wooden pavement. A firm and true foundation of cement concrete is stipulated for, to preserve the surface of the finished road smooth, even, and in order, and to prevent the uprising of the subsoil. The layer of felt is stipulated for to form an elastic cushion for the wooden blocks, and so soften the blows given by

\* Addressed to "M. le Président de l'Union Centrale des Arts décoratifs, au Palais des Champs Elysées, Paris."



the swiftly-moving wheels. The felt in the joints is to enable the blocks to be laid close, and yet have elasticity, and be in a great degree water-tight. The wood is to be sound, true in dimensions of depth, and soft in texture (like white pine), so as to have more elasticity than a harder substance has.

The character of wooden pavements may be known by the occupants of carriages in driving over them. Where the blocks are laid upon sand and boards, the vibrating and drumming effects on nerves and ears are most distressing. When laid with open joints the surface becomes rapidly worn and uneven; and when laid upon an imperfectly-formed or weak foundation, the surface also becomes uneven, alternately hills and holes, retaining dirt and wet, and so tending more and more to the destruction of the material and the road. Blocks of wood, unexceptionable in character, form, and dimensions of material, laid hard on an exceptionally good cement concrete foundation, close-jointed, but without the felt bedding and jointing, have a disagreeable jarring effect, though in a less degree than the examples previously described.

Some of the wood-paving companies must have been very stupid, and also very difficult to teach, or they would have learnt, by their failures, sooner than they appear to have done, and we should not then have seen most important main thoroughfares blocked for weeks at a time by the pulling up of the entire wood construction to begin again as from the beginning, and this process more than once over. Poor London! How long must she suffer under the divided rule of parish vestries, having no uniformity of action, either in main-sewering, house-draining, or in wood-paving? The costs to shopkeeper-ratepayers in paying directly and indirectly for defective street-surfaces broken up to be re-laid would tot up to something enormous.

ROBERT RAWLINSON, C.E.B.

P.S.—Cement foundations for wood-block paving ought to have ten or twelve days to "set," but in London this time can seldom, if ever, be given, and this may, in some cases, account for partial failures. Wooden pavements, in themselves, make no mud, but this is carried on from adjoining dirty macadam and "set" paving. When, therefore, wooden pavements are muddy, it shows neglect in street-sweeping.

#### NEW CITY MARKETS.

WHATEVER may be said of the Corporation of London by detractors, there is no gaining saying the fact that it has provided and is providing a series of markets worthy of the City. Even in regard to Billingsgate Market, the inadequacy of which is to a large extent due to want of proper approaches, the City authorities have done a great deal to increase the accommodation there of late years, the market as it was erected by Mr. J. B. Banning, Mr. Horace Jones's predecessor in the office of City Architect, having been taken down and re-erected, and at the same time considerably enlarged. The question of the future of Billingsgate Market is still under consideration by the Corporation, and in the mean time the experiment is to be tried of utilising the new market in Farringdon-road as a market for railway-borne fish, it having the advantage of being built, like the adjoining markets, partly over a railway. This structure, now approaching completion, was originally intended for the sale of fruit and vegetables, in lieu of that ruinous and dreary place known as Farringdon Market, and the Corporation are promoting a Bill in Parliament giving them the power to use it (experimentally) as a fish-market. If the experiment demonstrates that there is a need for a second fish-market within the City, the new structure will probably be permanently diverted from its original purpose, and there will still remain the question of dealing with Farringdon Market. Into that we need not stay to enter. We may here note that, pending the time when the Corporation is granted the power to convert the new market to the purposes of the fish trade, the fittings of the shops, the paving of the interior, and some other works, are in abeyance. The whole of the market area is now roofed in, and a very pleasant and well-lighted space it forms. It is nearly square on plan, and forms a continuation westward of the group formed by the new Central Meat and Poultry Markets, all of which, as well as the market we are now more particularly referring to, and the new Leadenhall Market (of

which we say something further on) have been designed, and their erection superintended, by Mr. Horace Jones, the City Architect. The ironwork at the new market in the Farringdon-road has been supplied by Messrs. Rowson, Drew & Co., Messrs. Mowlem & Co. being the general contractors, and Mr. Boreford the clerk of the works. The market is distinguished from the meat and poultry markets in having shops, forty-one in number, on the exterior, in addition to the thirty-three shops inside the market. The roadway which separates the new market from the poultry market will be roofed over, so as to provide covered standing room for vehicles, &c. The principals of this roof, of 60 ft. span, very solidly framed in pitch-pine, are now ready for being placed in position. Mr. Horace Jones, when presiding the other evening at a meeting of the Royal Institute of British Architects, spoke of a method he had adopted, and with success, of building-up circular columns of eight lengths of rolled iron of curved section, and having flanges which are bolted together. By this means longer and stronger supports are obtained than would be possible by means of casting, and the effect obtained, that of a column with wide shallow flutings, is by no means unsatisfactory, as can be seen in the new market, where four of such supports are used to carry the large central dome or lantern. A street improvement of some importance is being made in connexion with this market, viz., the formation of a new roadway on its south side, in continuation of Long-lane, Smithfield (greatly widened and improved of late years) and of the roadway along the south sides of the Meat and Poultry Markets. This road extension will debouch upon Farringdon-road a little to the north of Holborn Viaduct, at the north-west corner of the modern thoroughfare known as Snow-hill. The remaining frontages to the market will be, on the west, to Farringdon-road; on the north, to Charterhouse-street; and on the east to the covered roadway on the west side of the Poultry Market, already referred to. Two years ago\* we gave a view and plan of the market, which may be usefully referred to.

The new Leadenhall Market, or rather, a portion of it, was recently opened by the Lord Mayor, and bids fair to be not the least of Mr. Horace Jones's successes in the way of market buildings. It has one of its main entrances in Gracechurch-street, towards which it has a frontage of 63 ft. 2½ in. This portion of the building is three stories in height, and is of red brick and Portland stone, having a recessed centre from which the arcade opens, and two wings, the one on the south forming a portion of the new "Half Moon" Tavern, which extends backwards, however, along the main arcade of the market, for a distance of about 70 ft. Roughly speaking, the plan of the market, so far as at present carried out or in progress, is that of a Latin cross of somewhat irregular shape, with a semi-octagonal space at the intersection of the limbs. What we may call the lower or longest limb of the cross is the portion of the covered avenue or arcade extending eastward from the entrance in Gracechurch-street to the dome, 44 ft. diameter, which covers the semi-octagonal space before mentioned. From the entrance in Gracechurch-street to the centre of this space the distance is 192 ft. 9½ in. This avenue, which occupies the site of Half Moon Passage, is continued on the opposite side of this space in what would be, if the plan were symmetrical, the upper vertical limb of the cross, for a further distance of 97 ft. 9½ in. In consequence, however, of the position of the entrance in Lime-street, which street at this point is somewhat tortuous, this continuation of the arcade is inclined somewhat to the south-east, or, to make our meaning clear, the upper vertical member of the cross leans to the right. The arms of the cross run north and south, but the one northward of the dome at the intersection is lopped off short. The other arm or avenue extends southward for a distance of 125 ft. 9 in. To the eastward of this avenue, and to the southward of that portion of the main avenue which we have described as tending in a south-easterly direction, the market area is intersected at right angles by minor avenues. Altogether, there are more than thirty shops already provided. Each shop averages about 15 ft. square, and has a height from floor to ceiling of 16 ft. Beneath each shop is a basement about 14 ft. deep, paved

with Claridge's asphalt. The surface drainage of these basements is kept quite distinct from that for the water-closets and rainfall. Above each shop are two rooms, the first-floor windows opening into the covered arcade, and the second-floor windows above the louvred glass roofs. The width of the carriage roadway in the main arcade is 30 ft. throughout, with a footway 7 ft. wide, on each side in front of the shops. The roadway and footways are paved with Val de Travers asphalt. The ironwork consisting largely of the fluted columns and pilasters which divide the frontages of the shops, has been supplied, to the City Architect's designs, by the Horsley Company, of Tipton. The ornamental frieze running along the main arcade beneath the cornice, and a number of panels, have been well modelled in plaster of Paris by Mr. Mabey, who has also executed the carved pediments over the entrances, containing the City arms, in a creditable manner. The amount of the contract (exclusive of the "Half Moon" Tavern) was 47,500*l.* Mr. B. E. Nightingale, of the Albert Embankment, is the contractor, his foreman being Mr. Thompson. It is but little more than a year ago since the workmen commenced operations, and the present contract is fast approaching completion. It is in contemplation to extend the market considerably both to the northward (on the site of the old hide and skin market) and to the southward, on the site of the insufferably close and stuffy sheds where now poultry (dead and alive), dogs, cats, rabbits, and guinea-pigs are inconveniently crowded together. When these wooden sheds, in which straw is abundant, are replaced by the continuation of the buildings we have briefly described, not only will it be to the advantage of the health of the salesmen and their assistants, but the less danger will there be of a disastrous fire occurring in this quarter of the City.

As was to have been expected by those familiar with the history of this part of the City, during the progress of the works considerable Roman and Mediæval remains were found. These have been carefully measured and delineated by Mr. Miller, the able clerk of the works, and have been visited by many well-known archaeologists. The excavations for the market basements were carried down 17 ft. 3 in., but portions of Roman walls were found to go down 7 ft. 6 in. below this, or a total of 24 in. 9 in. below the present level. A well-preserved piece of Roman wall, 4 ft. 11 in. thick, on a gritstone base, is left in the vault forming the front part of the basement of the shop at the northern corner of the entrance to the market from Gracechurch-street, and this (we are glad to learn) is it proposed to preserve by railing it in.

We may, perhaps, usefully conclude this notice by giving a few historical details as to the market, which have been gleaned from Northcote's "History of London," and from Skyrpe's edition of Stow's "Survey."

According to Stow, Lime-street, which gives its name to the ward in which Leadenhall is situated, is supposed to derive its name from the making or selling of lime there.

The following is from Northcote's description of Leadenhall as it existed in his time:—"On the south side of the street which receives its name from it, stands the front of the quadrangle called Leadenhall, the largest market in the City of London. . . . In the year 1444 the parson and parish of St. Dunstan-in-the-East, finding Simon Eyre, a rich citizen, intended to erect a granary for the citizens at Leadenhall, they granted the City some adjoining ground in Grass-street, now Gracechurch-street, to enlarge it; this granary was accordingly built of square stone, with a chapel at the east end. In the year 1463, the beam for the tronage and weighing of wool was fixed at Leadenhall by charter of King Edward IV.\* . . . Great part of Leadenhall was burnt down by casualty in 1484. About the year 1534 the Court of Common Council met several times to consult about converting Leadenhall into a bursar or exchange for merchants to assemble in, as they

\* This charter (dated Aug. 27, "in the third year of our reign") ordains "that the tronage and weighing and measuring, laying-up, and placing, and housing of whatsoever wools, by whomsoever from whatsoever parts brought or to be brought to the city, or which have before time been accustomed to be brought to the staple at Westminster, shall from hence be and be made in the place called Leadenhall, and in no other place within three miles of the city," the mayor, commonalty, and citizens to receive the emoluments from the same laying-up, placing, and housing.

\* See *Builder*, vol. xxxviii., pp. 71, 73.



did at that time in Lombard-street, but from some obstructions that do not appear, the scheme was laid aside. The Great Fire in 1866 stopped at this hall, the stone-work of which stood, though all the houses about it, and in the courts belonging to it, were destroyed. Before this fire, the country people who brought provisions to the market had their stands in the open street between Gracechurch-street and Lime-street; which being in a very inconvenient situation, the City after that disaster purchased some adjacent ground behind, and converted it into a market. Leadenhall Market, therefore, in its present state,\* consists of the following parts:—Leadenhall, properly so called, which is a large antique building inclosing a square in the middle, and having its principal front in Leadenhall-street. In this edifice are the warehouse for leather, the Colchester baize-hall, the wool-hall, and the meal-warehouse. The entrance into the square from Leadenhall-street is through a large Gothic gate; and as there is but little meat sold here except beef, this is called the beef-market. On Tuesdays this is a market for leather; on Thursdays the wagons from Colchester and other parts come with baize, &c., and the fell-mongers with wool; on Fridays it is a market for raw hides; and on Saturdays for beef. Behind this market are two others separated by a range of buildings of considerable length, with shops and rooms on each side. In these are principally sold small meat, as mutton, lamb, veal, and pork, and some of the shops sell beef. In the easternmost of these is a market-house supported on pillars, with vaults underneath, rooms above, and a clock and bell-tower; within are sold various sorts of provision. Beyond these is a spacious market for fowl. There is another called the Herb Market, which has an entrance into Leadenhall-street; and the passages into the above markets from Lime-street and Gracechurch-street are filled with dealers in provisions of various kinds." (pp. 662, 663.)

To this description we may add that in a plan of Lime street Ward, given by Styrpe, and also in Northouck's book, three irregularly-shaped market areas, besides the main quadrangular space at the back of Leadenhall, are shown. Adjoining the south-east corner of this quadrangular space is the smallest area of the three, which is described on the map as the "Fish Market," although no mention is made of fish in the foregoing description. East of this fish-market is shown the "Flesh Market," reaching nearly as far as Lime-street, from which there is an entrance to it. South of the fish-market is the "Herb Market," which is nearly square, and larger than either of the other two detached areas. This herb-market has also an entrance from Lime-street, towards which it, though westward of the flesh-market, extends much nearer than the latter, owing to the fact that the street in this part winds in a south-westerly direction.

#### A VOICE FROM THE SMOKE ABATEMENT EXHIBITION.

It is a significant fact that what we may perhaps call the first semi-official utterance of the Smoke Abatement Committee takes the form of a recommendation to burn gas. Not that there is, or can be, as yet, any such outcome of the investigations in progress under the care of Mr. D. K. Clark. But a lecture by Mr. Sugg, delivered in the Council Chamber of the Royal Horticultural Society, on the 26th ultimo, must be admitted to be, at all events, a broad hint in that direction.

Of gas as the fuel of the future it is not now for the first time that we have to speak. We can refer to not a few instances, as in the article on "Fog," in the *Builder* of February 21st, 1880, in which we have endeavoured to point out the *pro* and *con.* of gaseous fuel. So great is the convenience, instant applicability, economy of idle time,—that is to say, of time lost in raising and extinguishing fire, before and after it is wanted,—and, above all, cleanliness and noiselessness, that the general use of gas as fuel may be regarded as a question of time,—the main point to be desired being the cheapest possible distillation of the fuel. The limits of the case are plain. A ton of coal will yield from 9,000 to 10,000 cubic feet of gas. The coal will yield in consumption, on theory, be it remembered, thirty-two million units of heat. The gas will yield on combustion something

more than seven and a half million units of heat. But then the cokes and other products of distillation have to be taken into account. The price of gas in London is now 3s. per 1,000 cubic feet, so that a million units of heat produced from gas will cost nearly seven times as much (subject to reduction, as before remarked) as from coal. Against this is to be set the waste of heat in the open fire,—perhaps from 40 to 80 per cent, the gain in economy of time, and the other advantages above named. Still, we apprehend that the steady testimony of the gas-meter is very eloquent against the use of the more scientific fuel. But if the anticipation of Mr. Ernest Hart be fulfilled, that before long we shall have gas, at least for heating purposes, at 1s. per 1,000 cubic feet, it is evident that the conditions of the case will be altered. With gas at that price, a million of heat units from gas would cost 160d., while the same quantity produced from coal at 20s. per ton would cost 73d. But of this latter theoretic quantity of heat, the proportion actually utilised, without vast improvements on our present mode of combustion, would be so much, that we have little doubt that the balance of £. s. d. would be very much in favour of the gaseous fuel by the end of the year.

No one can be entitled to speak with more authority on the subject of gas combustion than Mr. Sugg, to whose ingenuity we owe very great practical improvements, as well in quantity as in quality, and also in cost of light. Mr. Sugg has grasped the two main principles of economic gas burning, as far as the production of light is concerned, viz., to burn at a very low issuing pressure, and to supply a proper quantity of atmospheric air to the flame. We have no doubt whatever that very much higher results are capable of being produced in this direction by a more complete application of the two principles. At the same time, gas burners ought to be thankful for what has already been done by Mr. Sugg, as well as by Mr. Heron, and it is their own fault if they do not effect a large reduction in consumption, while enjoying a better quality of light, by the substitution of either the Sugg or the duplex burner for the old fish-tail.

We have before now alluded to the difficulty which would attend the supply of two kinds of gas, the ordinary carburetted hydrogen for light, and marsh gas, or carbonic oxide, which burns with a pale blue flame and intense heat, for the purpose of heat. If the science of the electrician should hereafter overcome the difficulties which still oppose the production of light by the dynamo-machine for ordinary domestic use, the matter would be simplified. In the meantime it will be well for those interested in the manufacture of gas to turn their serious attention to any methods of combustion by which the ordinary supply of gas may be made to yield more heat than at present, although perhaps at the cost of light. One of these is Bunsen's burner, which admits a portion of atmospheric air to mingle with the gas before ignition, and produces a low pale flame and intense heat. If the ingenuity which has been so long directed to the end of enriching ordinary gas so as to yield more light on combustion, be directed to the end of increasing the dose of hydrogen in the hydro-carbon, we think much may be done for the reduction of the cost of gas-heating. The stoves and cooking apparatus to which we referred in our accounts of the opening of the exhibition, and which were explained by Mr. Sugg in his lecture, were very admirable as applications of heat produced from gas to culinary and other domestic purposes. But what we are now looking at is, not so much the application of gaseous fuel as the provision of the cheapest kind of gaseous fuel. It seems to us that we must look in that direction for the most probable source of abatement of the smoke of London. But no argument in the matter will long resist the *argumentum ad crumenam*. If the smoke reformers will place before them the equation between a million units of heat from gas, and a million of (available) units of heat from coal, and if they will contrive that the cost of the former shall be reduced at all in the proportion suggested by Mr. Hart, they will have made a beginning in the abolition of the worst features of London fog. They can never dry the valley of the Thames. But the mist need not be mingled with so large a proportion of unburned and wasted fuel, as is now the case, a mixture which, without some measures be taken to abate it, grows with the growth and increases with the increase of London.

#### MONUMENT IN HIGHGATE CEMETERY.

THIS monument was executed in London by Signor Facigna for Mr. W. H. Crossland, architect, in memory of his late wife. It is executed in Sicilian marble on a red granite plinth, the whole resting on a landing of blue granite. The figure is rather larger than life, and a cast of it was exhibited at the Royal Academy. The architectural portion of the monument was designed by Mr. Crossland.

#### THE "BROOK HOUSE" INN, NEAR LIVERPOOL.

THIS inn is built about three miles outside the city of Liverpool, within a few yards of the site of the old "Brook House," which was pulled down four years ago. It has been erected with the common bricks made in the neighbourhood, the angles, &c., being of Rusbon red bricks, and the plinths, strings, window mullions, &c., of Woolton red stone. The roof has been slated with Bangor slates, in red and blue courses, capped with Cooper's red ridge tiles. The contracts were taken by Mr. James Tayler, of Wavertree, for the brickwork; Messrs. J. & T. Saunders for the masonry; Mr. J. Houlst for the plumbing; Messrs. Nicholson & Ayre for the carpentry; and Mr. Thomas Jones, of Mount Pleasant, for the slating, plastering, and tiling. The stables are laid with Mr. T. Jones's patent cement on brick foundation. The cellars are also laid in the same manner. The parlour is 16 ft. by 14 ft., exclusive of bay window. The bar-parlour, or sitting-room, is 16 ft. by 14 ft.; the billiard-room, 24 ft. by 18 ft.; the bar itself, 16 ft. 6 in. by 16 ft. The house has a small yard to itself, not including the stable yard. There is a weighing-machine on the road-side, attached to the inn, and a bowling-green at the back, with a small house. The work was designed by Mr. J. Elliott Reeve, architect, of Liverpool, and carried out under his superintendence.

#### NEW COUNTY SESSIONS HOUSE, LIVERPOOL.

THE new Sessions House for the Kirkdale division of the county of Lancashire,—view and plan of which we give this week,—is about to be erected at Irlington Flage, Liverpool, and will form a continuation of the range of public buildings which close the north side of the St. George's-place, in that city, the Walker Art Gallery being its next neighbour.

The new building is necessarily, from its surroundings, Classic in feeling, though there has been no attempt to reproduce any ancient example.

The portico entrance is reserved to the magistrates and members of the Bar, and as such may be considered private. The witnesses and solicitors have access by Mill-lane (a side street) to their offices and waiting-rooms. A portion of the latter is enclosed to allow those likely to be engaged in proximate cases to assemble together, a solicitors' and counsels' room being attached. On the level which may be styled the ground-floor, there is a small summary court for use by the magistrates, while the upper courts are engaged with sessional work.

A flight of steps communicates between the witnesses' waiting-hall and the two courts (which, with the magistrates' and barristers' room may be described as the first-floor level). Within the courts, and near the witness-box, seats are retained for those who are engaged in giving evidence. Above this part is the grand-jury box, connected by a stair with the grand-jury room. The accommodation for the Bar is arranged in a similar manner to that at the Assize Courts, St. George's Hall. The bench will seat sixty magistrates. The petty jury are seated on the left of the chairman, and their box communicates with a private jury-room.

The public attending sessions from no motives except those of curiosity have a separate entrance by a back-street, and are excluded from any association with those who have business at the courts.

The prisoners' cells are in the basement, a stone staircase connecting them with the dock. These cells will have cement floors on concrete, and will have a dado of white-glazed bricks.

The large court in dimensions is very similar to those at the Manchester Assize Courts. The small court preserves the general working

\* Northouck's book was published in 1776.



arrangements of the larger, but, of course, contracted; both have magistrates' private consulting-room connected with the bench.

The residue of the first floor level is occupied by a large and lofty magistrates' meeting-room, office for clerk of the peace, barristers' library, with robing-room attached, and the grand staircase, with corridors, &c.

The grand-jury room and dining-room, with kitchen, caretaker's apartment, and other needful accommodation, occupy the upper floor south of the court-rooms.

The interior finishing will be of the best character, oak and walnut being used for the most important joiner's work, fibrous plaster for ceilings, and other ornamental sections.

Granite and Chorley stone will form the base of the principal front, Ancaster being selected for the upper portions.

The courts will be heated by hot water, and the ventilation assured by powerful extractors worked by a gas-engine.

This Sessions House supersedes the old one at Kirkdale, which has been sold to the Government under the recent Prisons Act. The whole of the arrangements have been designed by Mr. George Holmes, the County Surveyor. In the erection of the building he will be assisted by his partner, Mr. Francis Holmes, the architect of the New Conservative Club in Liverpool.

The contract (slightly under 30,000l.) has been taken by Messrs. Holmes & Nicol, of Liverpool.

### SCHOOL PLANNING.

#### SHEFFIELD SCHOOL BOARD COMPETITION.

It was mentioned in our last that the plans marked "Dax A" and "Dax B," out of three submitted by Mr. O. J. Innocent, architect, had been selected in competition by the Sheffield School Board. We have reproduced the plans in our present number, and print the author's own descriptive particulars of Plan A. The whole may be regarded as a useful contribution to a study of the art of school planning:—

The distinguishing characteristic of this plan is that the class-rooms radiate from the head teacher's desk, the central hall being polygonal in shape. A reference to it will immediately show how this arrangement brings all the class-rooms within the shortest distance of the principal's desk, enables them to be fully inspected therefrom, and facilitates the combination of the class-rooms with the central hall to form one large auditorium whenever required.

The length of the central hall is 85 ft. 6 in., the average width in the direction forward from the desk is 42 ft. 6 in., giving an area of 3,633 square feet, the instructions requiring 3,600 ft. It is lighted by clearstory and gable windows of large size.

The class-rooms are made of the exact width stated, viz., 24 ft., this width being retained from the back of the room to the front of the desks, from which point the width diminishes slightly towards the front of the room. Eleven of the class-rooms are for sixty scholars, and the twelfth, making the required number, is 32 ft. wide along the bank, to accommodate eighty. The one for eighty, No. 5 on plan, can be divided into two forties, and so that either of the forties can be thrown to the adjoining class-room for sixty. No. 11 on plan is for sixty, and can be divided into two thirties, and so that either thirty can be added to an adjoining class-room for sixty. In this way rooms can be made for 30, 40, 60, 80, 90, 100, 120, 140, 180, or 200 scholars without encroaching upon the central hall.

All the class-rooms open into the central hall, but so that eight of them, Nos. 1, 3, 4, 6, 7, 9, 10, and 12, can be cleared without disturbing the work in it or any other rooms, and the remaining four can each be cleared either by passing through the central hall, or, if preferred, through one other class-room.

Windows are placed in the walls on the left-hand side of the scholars as they sit at desks in eight of the class-rooms, viz., Nos. 1, 2, 3, 4, 5, 6, 7, and 9. Ceiling lights, from the inner side of the roof not seen from the outside, are provided on the left of desks in four other rooms, viz., Nos. 8, 10, 11, 12, in addition to the windows.

The head teacher is able, from his desk in the central hall, to overlook the whole of ten class-rooms and more than half of the remaining two. A bell is provided in each class-room, to be rung from the principal's desk.

A cupboard recess is planned in the thickness of the wall in every class-room.

In each class-room a slide, adjustable to any height, will be fixed to slide vertically in an upright frame constructed of rolled iron, to be strong and yet so light as not to interfere with the purpose of the glazed partitions. When not in use the slide will slide below the glass line of the partitions.

The movable divisions are of three kinds. Those which simply divide a class-room into two are revolving coil-shutters; others, where suitable, are sashes sliding horizontally on Hadfield's patent rollers; while those between the class-rooms and the central hall have a solid pitch-pine framing for the dado, above which are two glazed sentences, the lower one sliding down and the upper one sliding upwards simultaneously on one of them being moved as they are hung to one another by Harcourt's patent chain over pulleys, each sash balancing the other without weights, thus saving the space otherwise required for boxings and simplifying the action.

Two entrances are provided for each sex, in order that the scholars can be divided, and the noise minimised at the commencement of school, play time, and dismissal. The lavatories and cloak-rooms are also distributed with the same object. Thus, not only are the boys and girls kept quite apart, but the junior and senior scholars will be separated while in school. The entrances nearest to the main front are nearly on the level of the street, and those towards the rear have steps in consequence of the fall of the ground, an arrangement which also facilitates other accommodation to be referred to. Sunk Venetian grates are provided at all the doors, and double swing doors to prevent through draughts. Inside each entrance is a cloak-room with wire-padded coats, so arranged as to avoid the crossing of the scholars; and a strong hook, numbered, is provided for every one.

A lavatory is provided adjoining each outer door, with the floor sunk, sloped, and leaded, and the walls tiled, also tap and waste-grate for caretaker.

On the boys' side over the main entrance are head teacher's room, 13 ft. by 11 ft., and male assistant teacher's room, 16 ft. by 12 ft. 6 in.; and similarly on the girls' side over the main entrance are female assistant teachers' room, 16 ft. by 12 ft. 6 in., and a room for school managers or visitors, 13 ft. by 11 ft. These rooms are placed sufficiently out of the way to be removed from a probable use as class-rooms, for which they are too small, and yet so as to be easily accessible, and they overlook the playgrounds. Proper lavatory and press accommodation to each room.

A spacious play-room is obtained on the basement floor, under class-rooms Nos. 4, 5, and 6, the fall of the ground allowing of this. The room has a fixed seat along the sides, is 83 ft. long, 26 ft. wide, well lighted, and can be approached from either boys' or girls' secondary entrances.

The levels of the ground permit a room to be placed on each side of the building below the main floor, which the scholars, boys and girls separately, can use for dining, warmth, or other purposes, when the schoolrooms are closed. Each of these rooms is 26 ft. by 13 ft., and has a large hot plate for warming dinners.

The covered portions of playgrounds are of the areas stated, and they are placed with their backs to the north, so that the sun shines on the open front, the roofs project well forward, and the floors are well sloped, to ensure quick drying after driving rains.

Storage for school books, slates, &c., is provided to a sufficient extent, and kept aired by the warming apparatus.

The main building is placed on the north side of the land, so as to open the playgrounds to the sunshine, and to get the yards, three in number, as square and commodious as possible.

The infants' department is in a separate building, and the principles upon which it is planned are generally the same as those which have guided the disposition of the mixed department. The schoolroom is 63 ft. 6 in. long by 22 ft. wide, capable of being divided, and there are three class-rooms, each 25 ft. by 20 ft. 8 in., and a babies' room, 27 ft. by 24 ft.; all with left-hand lights, and easy supervision. (Should any alterations in the Government regulations occur in class-rooms, it can be made without affecting the other arrangements of the plan.)

The head teacher's room, 14 ft. 6 in. by 12 ft., and the assistant-teachers' room, 15 ft. 6 in. by

12 ft., are placed over the entrance. Each of the rooms has a window looking into the school-room, and there are proper lavatory and cupboard provision.

The out-offices are conveniently placed, and carried out according to the detailed instructions.

In the upper part of the building for infants, and with all its apartments on one floor, the dwelling-house for the caretaker contains living-room, 15 ft. by 11 ft. 9 in.; kitchen, 11 ft. 6 in. by 7 ft. 6 in.; and three bedrooms, respectively 16 ft. by 9 ft. 6 in., 11 ft. 9 in. by 9 ft. 9 in., and 8 ft. 3 in. by 7 ft. 6 in. There is direct access to the house from the street without opening the play-grounds, and the ground-floor lobby has a door as well from the school-yard. Bells from each department of the school ring in the caretaker's house.

The buildings are designed in the English Domestic style of architecture.

#### Plan B.

The distinctive characteristics of this plan are that all the desks in the class-rooms face the central hall, and that the class-rooms are placed in four sets of three, to carry out through all the class-rooms the idea of dividing the middle one of three. None of the class-rooms are placed at a great distance from the head teacher's desk, and all of them can be added to the central hall when required.

The central hall is 90 ft. long by 40 ft. wide, giving the exact area desired, 3,600 square feet. It is completely lighted by large windows in the sides and ends above the roofs of the class-rooms.

The movable divisions are of three kinds. Those which simply divide a class-room into two are revolving coil shutters; others, where suitable, are sashes sliding horizontally on Hadfield's patent rollers; while those between the class-rooms and the central hall have a solid pitch-pine framing for the dado, above which are two glazed sashes, the lower one sliding down and the upper one sliding upwards simultaneously on one of them being moved as they are hung to one another by Harcourt's patent chain-over pulleys, each sash balancing the other without weights, thus saving the space otherwise required for boxings, and simplifying the action.

#### Plan C.

This plan differs from the others in having the head teacher's desk placed near one end of the central hall, which is a simple rectangle in plan, and in having both departments in one building.

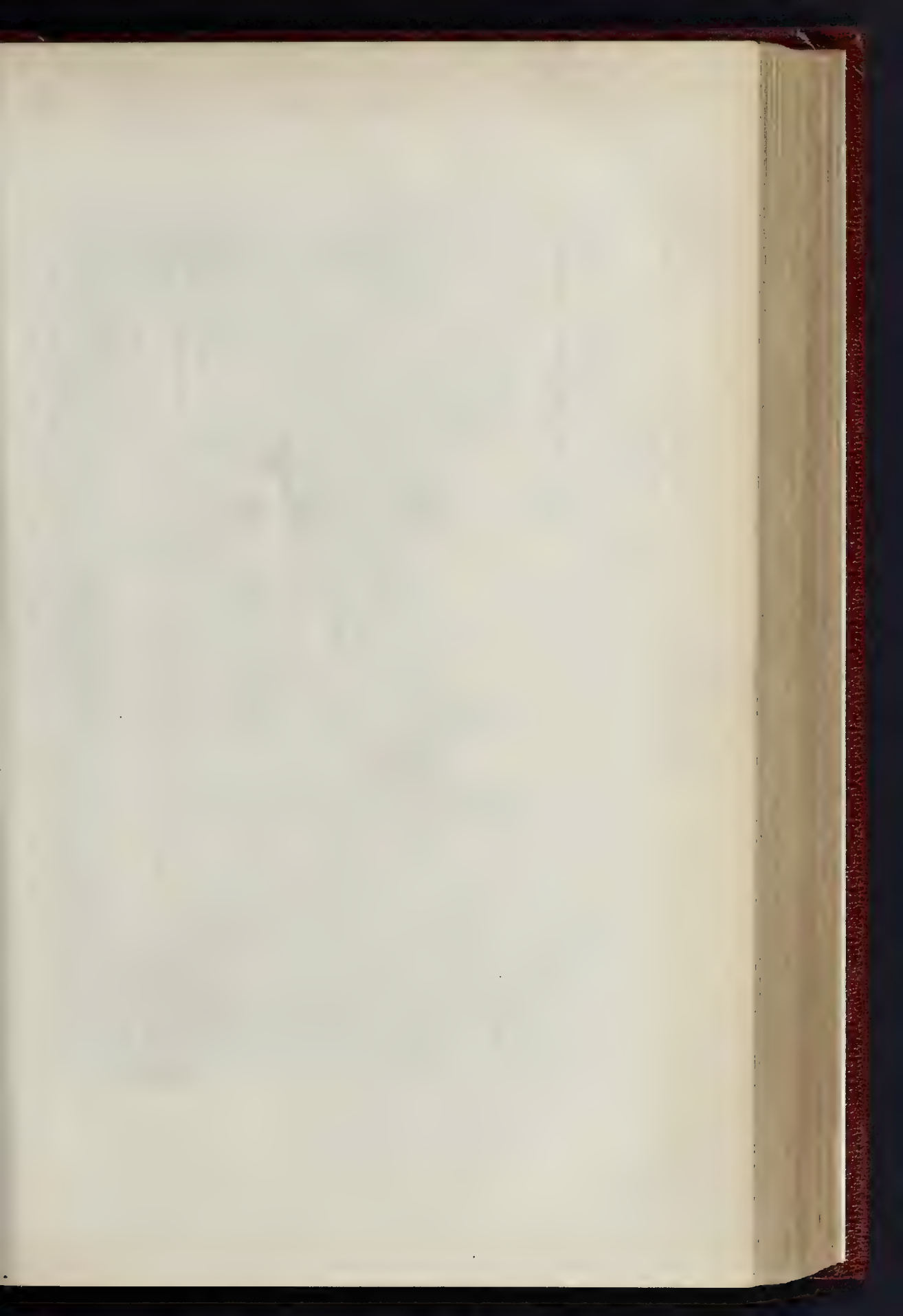
The size of the central hall is somewhat larger than named in the requirements, being 92 ft. long by 45 ft. wide, well proportioned and freely lighted by side and end windows in the clearstory. The head-master's desk is movable on small wheels, so that he can have it in a forward or backward position at pleasure.

### THE VICTOR EMMANUEL GALLERY, MILAN.

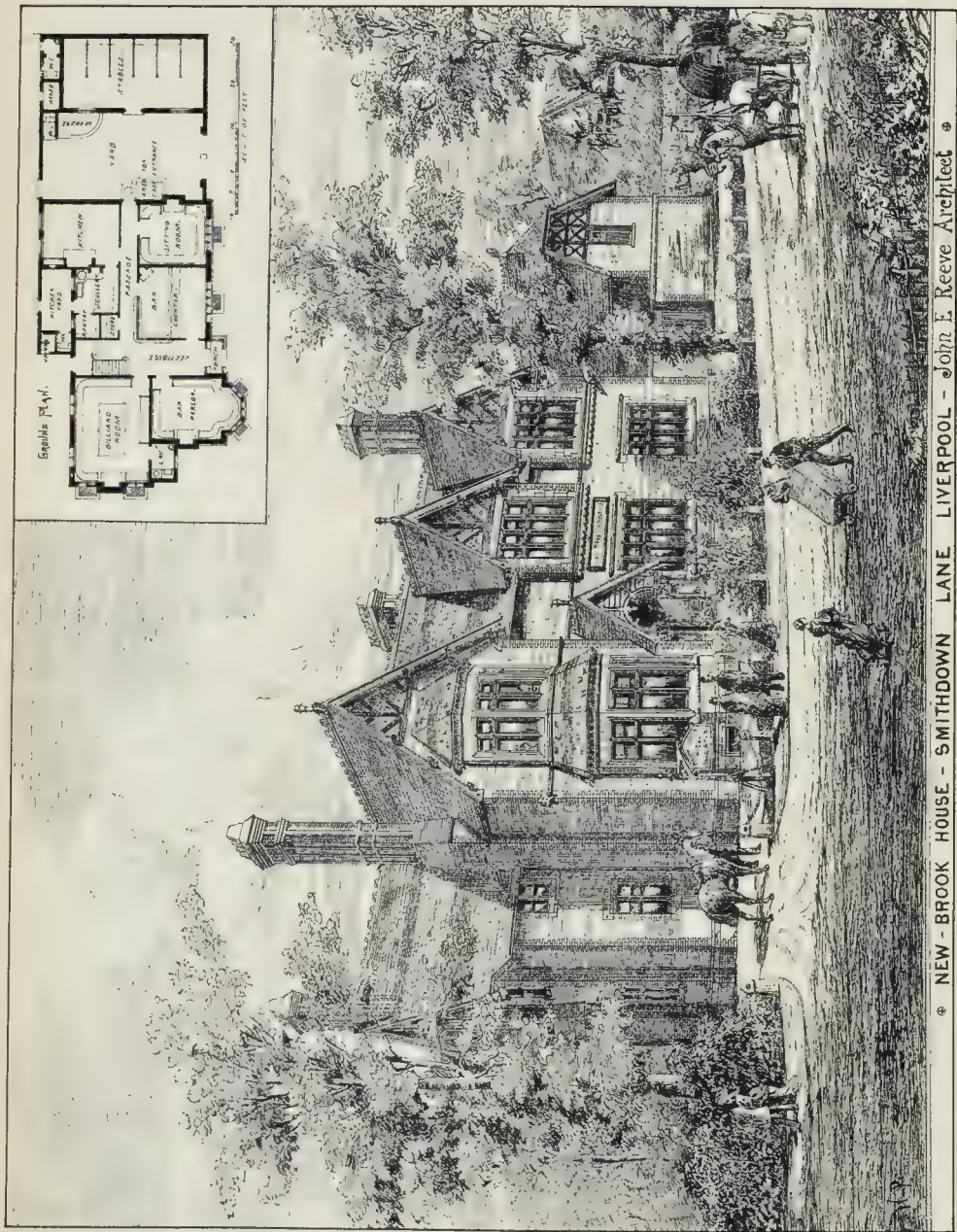
This gallery, of which we give a view, is cruciform, its longest limb being 640 ft., the shorter arm 345 ft. long. Below the dome, the angles of the cross are broken; the central part has the form of an octagon, upon which rises, at a height of 160 ft. from the floor, the dome of iron and glass, of a diameter of 128 ft. The covered road is 43 ft. wide. The gallery took two years to complete, the architect being Signor Mengoni. The best Milanese sculptors have supplied the twenty-four statues of illustrious men which adorn the pilasters. Situated in the centre of the city, the gallery forms an agreeable promenade both for the inhabitants and visitors. We have already given some illustrations of it, and supplement them with the accompanying more complete interior view.

The Regent's Canal, City, and Docks Railway Company proposes to utilise the Regent's Canal, and a railway is intended to be formed, partly on the site of the canal and partly on the site of adjacent property, extending from the Great Western Railway Terminus at Paddington to Barbican. The houses on the north side of Bridgewater-square, which are usually attributed to Wren, are scheduled by this Company, for the purpose of forming a new street in substitution of a portion of Fann-street, which is proposed to be diverted.





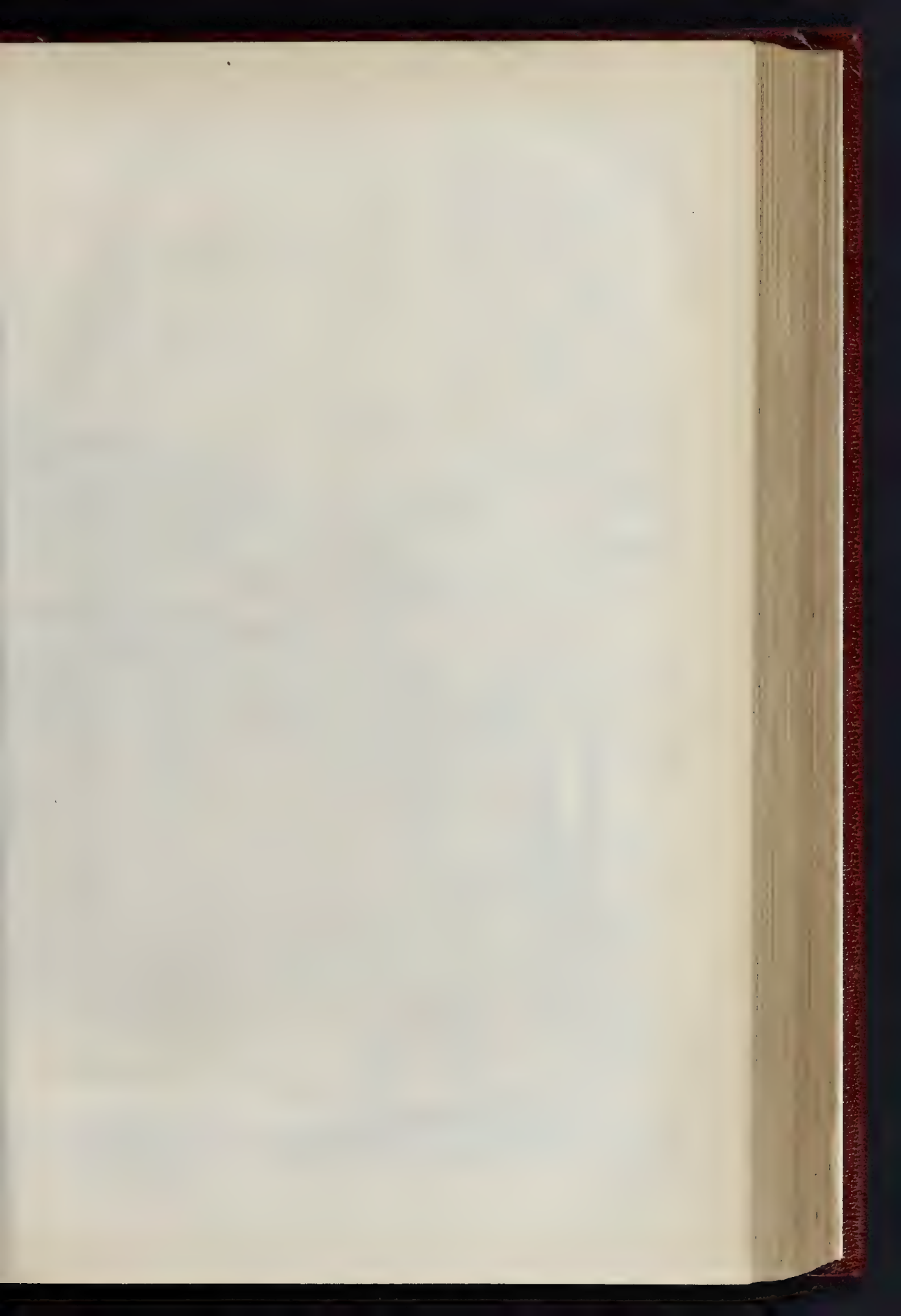
THE BUILDER, FEB. 4, 1882

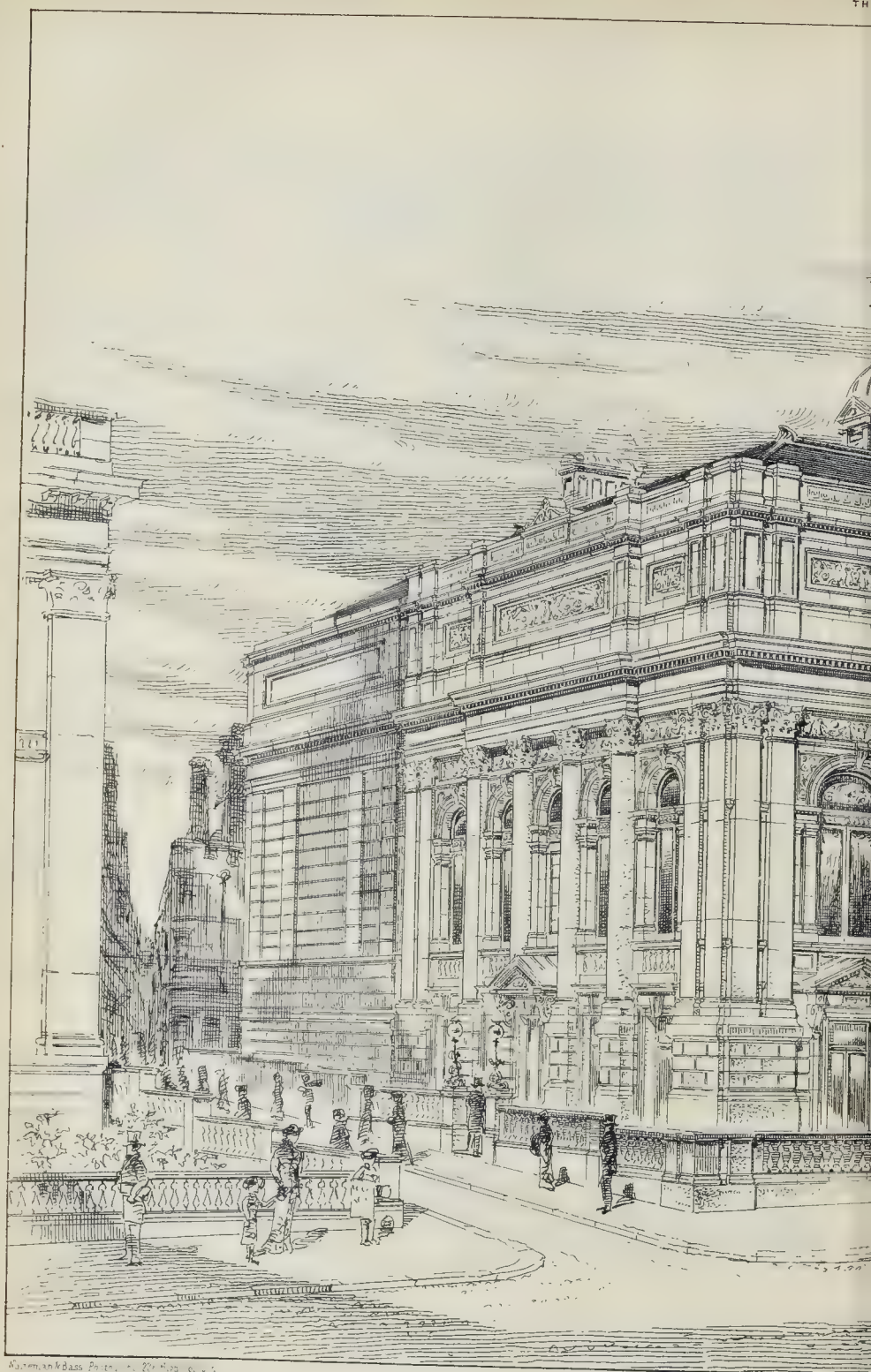


NEW - BROOK HOUSE - SMITHDOWN LANE LIVERPOOL - John E. Reeve Architect

W. & A. G. 1882



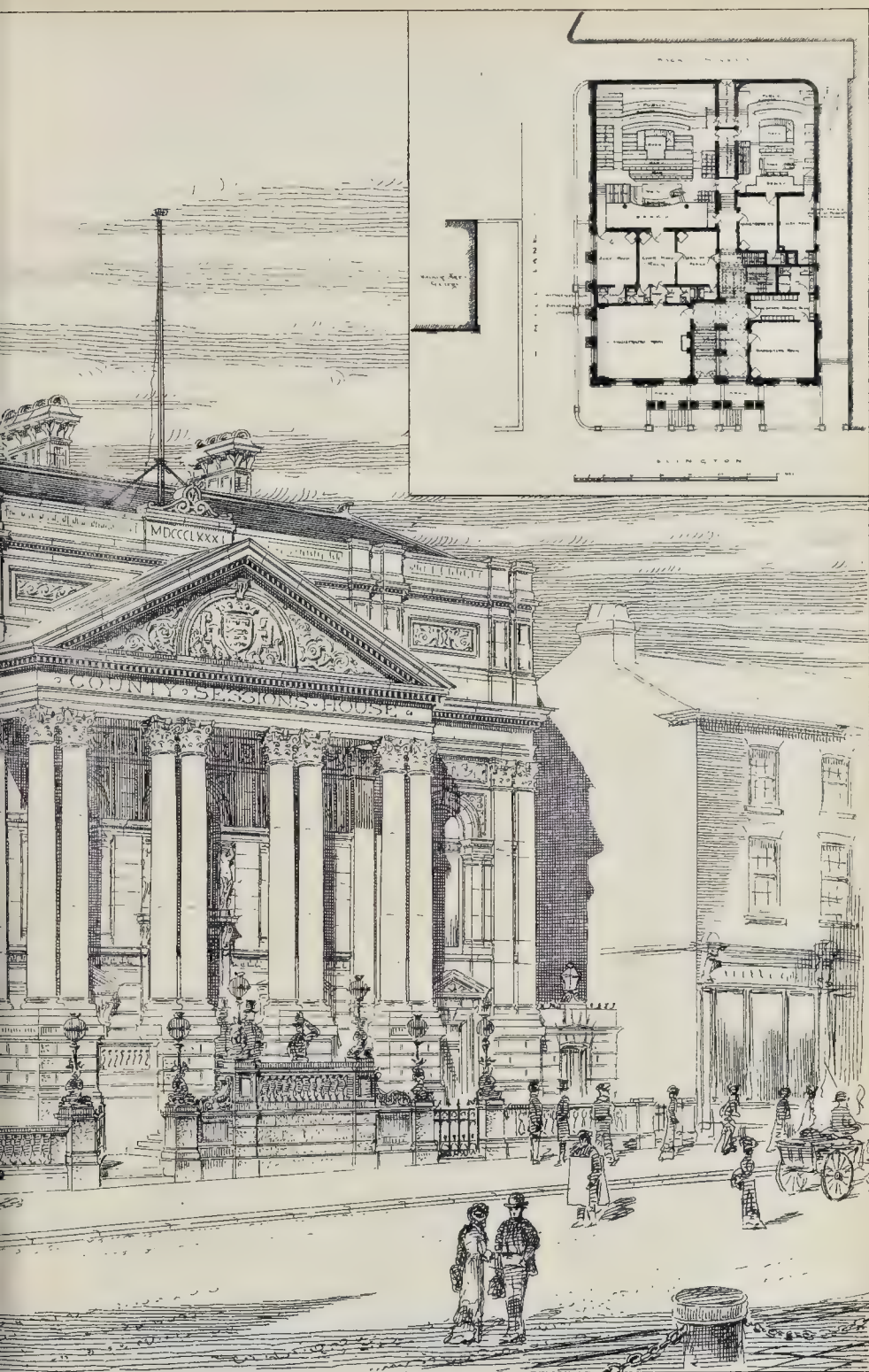




H. J. B. & Co. Print. n. 210. 1855. c. 1.

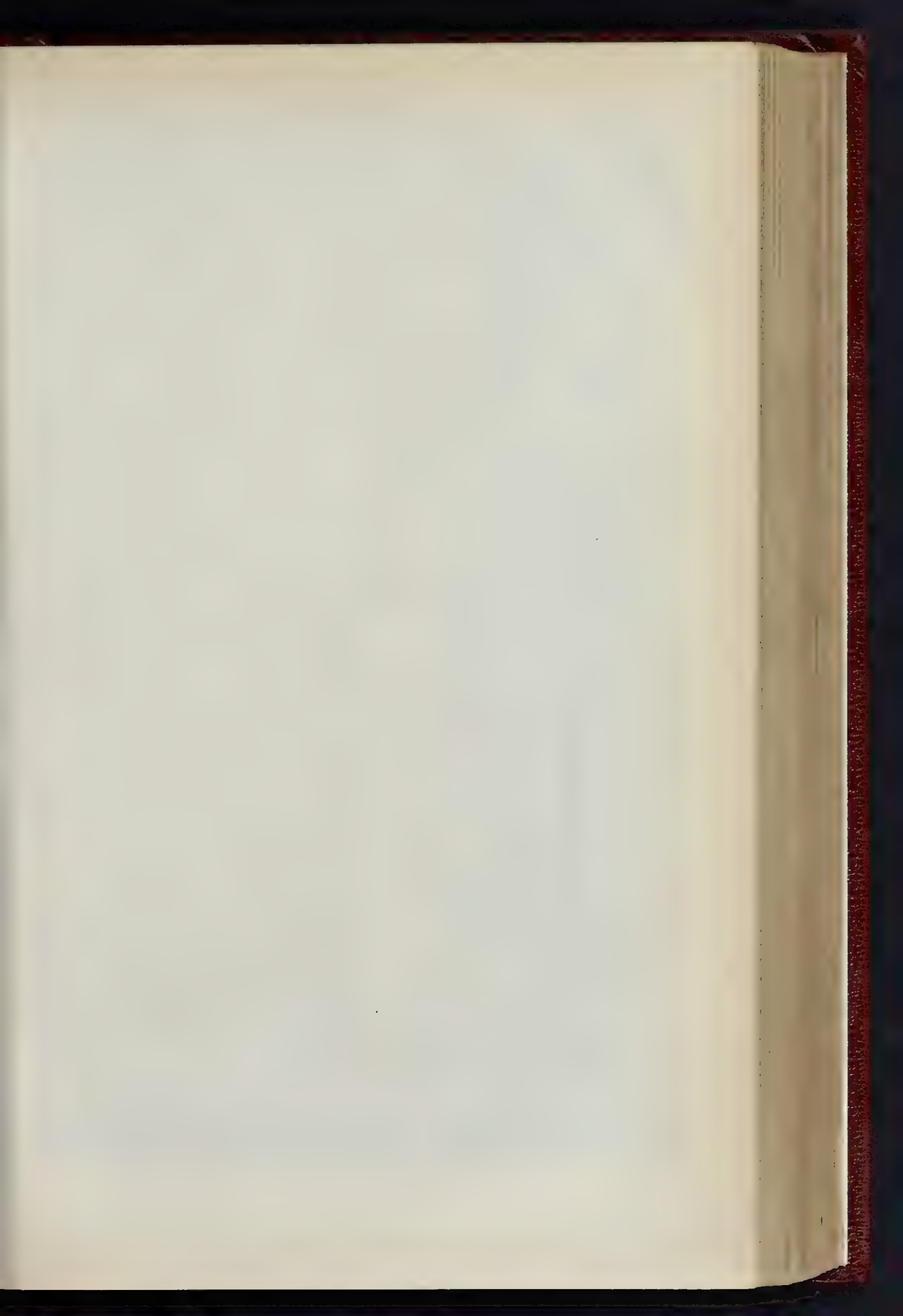
NEW COUNTY SESSIONS HOUSE F













A MONUMENT IN HIGHGATE CEMETERY. —SIGNOR C. J. FUCIGNA, SCULPTOR.

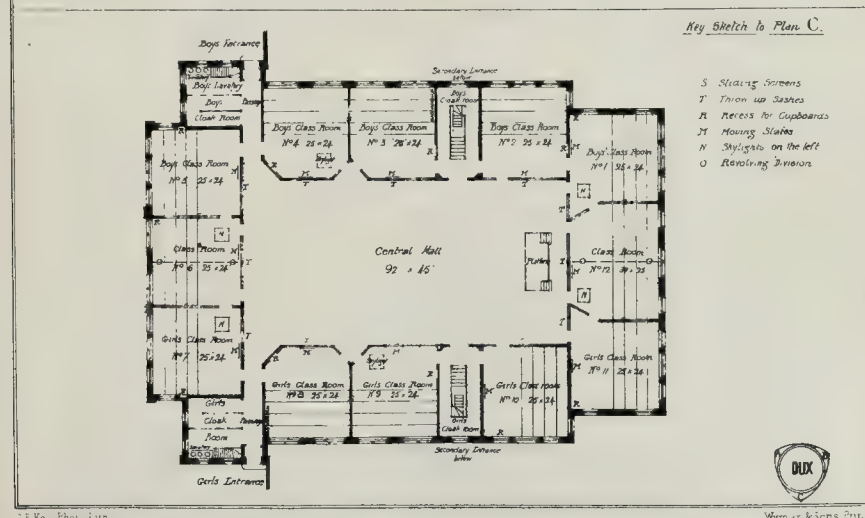
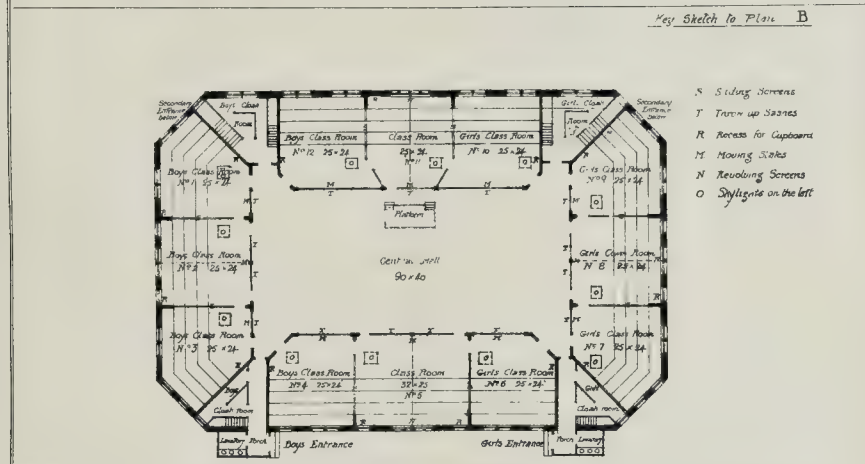
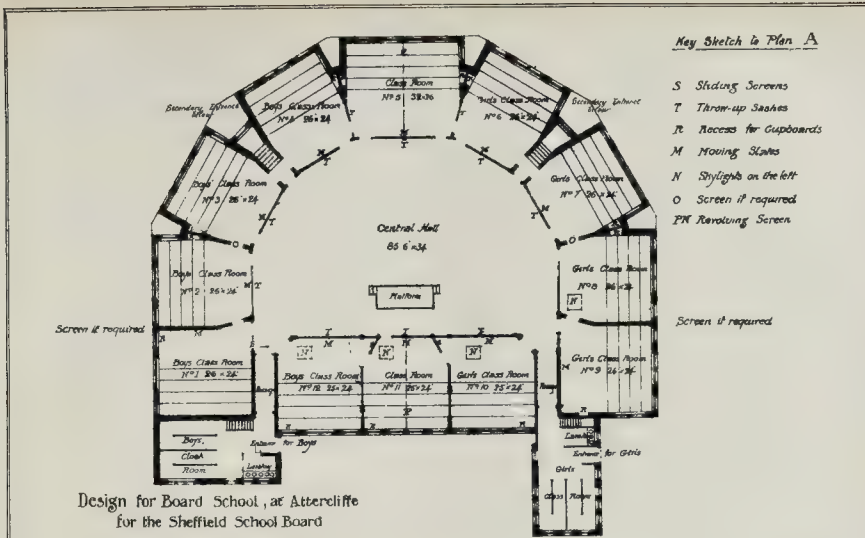




THE VICTOR EMANUEL GALLERY, MILAN.—SIGNOR MENGONI, ARCHITECT.







SCHOOL PLANNING.

Plans submitted in Competition for the Sheffield School Board by MR. C. J. INNOCENT, Architect.





## ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of the Architectural Association on the 20th ult., Mr. Aston Webb, President, in the chair, the following gentlemen were elected members, viz., Messrs. A. H. Rust, W. Dunn, A. Loader, G. B. Adams, W. Yonison, T. Freeman, J. T. Cress, A. Bowyer, and W. J. Elliott.

Mr. Philip E. Masey then read the paper on "Architectural Inconsistencies," the substance of which we printed last week (see p. 113, ante).

In the discussion which ensued,

The Chairman said that with regard to pupillage, he and doubtless many other members of the Association were more fortunate in their experience than Mr. Masey seemed to think pupils, as a general rule, could be in securing a reasonable fulfilment of the obligations their masters entered into when they took them as articulated pupils. As to barge-boards, while agreeing with a great deal that Mr. Masey had said on the subject, he had long been doubtful whether it would not, as a rule, make a much better job to bring the roof over the wall than to stop it against a parapet wall, the latter method entailing the use of flashings either in lead, zinc, or cement, but which, however carefully done, would occasionally let the wet in. If, for the sake of securing dryness and doing away with the use of flashings, the roof were made to project over the wall, it must be finished by means of a barge-board. He agreed with the reader of the paper in thinking that too much attention to ornament had led to too much fussiness in modern architecture,—to what Mr. Ingress Bell, in a paper read before the Association a year or two ago, had aptly termed "unrest" in architecture. He thought that Mr. Masey's criticisms on the Art-Union premises in the Strand were rather hard. In that building, the architect, the late Mr. E. M. Barry, had a particularly difficult problem to solve, for it was necessary that the first floor of the building should be a large picture-gallery, lighted from the street. In that story, therefore, the main windows had of necessity to be placed, and they had to be as large as possible. The second story or upper floor was only devoted to the purpose of store-rooms, and it was not necessary to make the windows so large. He thought that the architect of the building had endeavoured, and not unsuccessfully, to make the outward appearance of the building bespeak its internal arrangement.\* The mass of superincumbent masonry was not altogether without precedent, as witness the Doge's Palace at Venice and the Farnese Palace in Rome, both of which buildings had a considerable amount of wall space above the upper windows. As to tiles *versus* slates, he thought that in clay districts it was only common-sense to use tiles, that is, if they were good ones. He certainly found tiles to be warmer than slates. On the general question of inconsistencies in design, it was certainly a curious thing to find that, while it was almost the *raison d'être* of the Gothic revival that it was to get rid of the shams and inconsistencies which had been practised in the Classic styles, yet before the revival had reached its height many inconsistencies had crept in and obtained firm hold.

Mr. Masey's hints on drawing were likely to be particularly useful. He agreed with him in thinking that many architectural drawings were spoiled by having too much foreground. Indeed, the nearer a drawing of a building went to filling the paper, the better for the artist and the better for the building.

Mr. Gotch thought that Mr. Masey's paper was characterised by one failing. It seemed too strenuously to aim at being logical. While he did not deny that a window was meant, primarily, to admit light and to allow of being looked through, yet there was one other object in architecture to be served by a window, viz., that of adding to the architectural character or picturesque quality of the house. With regard to chapels and chapel-architects, upon whom Mr. Masey had largely exercised his critical faculty, it should be remembered that the architects of chapels were seldom altogether unfettered, either as to the plan or details of such buildings. He was conversing the other day with an eminent and wealthy Dissenter who had just returned from a visit to Constantinople, and who expressed himself as so favourably impressed with the minarets of that city as to declare that if

he were about to have a chapel built he would have a minaret to it!

Mr. Cole A. Adams said that in a paper read by him two years ago, on "Common-sense in Architecture," he had touched upon several of the points referred to in Mr. Masey's paper. He did not think that the author's criticism against the provision of "morning chapels" in churches was well founded, for such chapels had proved to be a necessity for early and repeated services, at each of which very few people would be present. Neither could he go all the way with Mr. Masey in his laudation of large sheets of plate-glass. He thought that a window might, quite consistently with its practical uses, be legitimately divided into a number of small panes, especially in the upper part. He agreed with the Chairman in his plea for the extended use of tiles, and might say that one reason why practical builders recommended tiles was that there were so many bad slates in the market. But there were tiles and tiles, and only those which had been well burned should be used. As an extreme case of the use of a non-local material, Mr. Adams instanced a mansion recently built for Lord Kenmare in the Killarney Lake district. There, although excellent stone abounded, red brick was preferred, and as the brick could not be made in the locality, it had to be imported.

Mr. F. H. A. Hardcastle, in moving a vote of thanks to Mr. Masey, said he never could see the reason why it should be laid down as a rule that a chapel should be something essentially different in style from a church. He could see no reason in art for such a difference. An idea seemed to prevail in some quarters that because in the past it had been customary to make a chapel distinctly plain, therefore that plainness should be perpetuated. He, on the contrary, thought that an architectural character should be given to chapels as to other buildings, the only things to be considered being consistency in style and truthful relation of the plan of the interior to the external aspect. He did not know that he quite agreed with Mr. Masey in thinking that the present age was an age of vanity in art, but he thought the present was not an age of art simply because it was not an age of faith. In no class of present-day society, whether exalted or lowly, did there appear to exist any definite belief upon any subject whatever, whether it were philosophy, religion, or art. Such a want of faith was, in his opinion, fatal to art, and until we emerged from the present chaos of opinion into something definite there would not be, because there could not be, any great achievement in the highest forms of art, whether in architecture or anything else, in this country.

Mr. G. R. Redgrave, in seconding the vote of thanks, said that, notwithstanding the evils of the pupillage system which Mr. Masey had criticised, somehow or other some of those who were brought up by it did attain to greatness. As to the question of using only the materials of a given locality in that locality, there would have been more force in that contention in the pre-railway era; but the facilities of communication and transport were now so great, and the country was, after all, so small, that it seemed to him absurd to say that in one part of the country stone only should be used, and in another part brick only, because those happened to be the natural materials of the district. No doubt, for the sake of economy, local materials would in most cases be used mainly in their own localities. As to slates for roofing purposes, he believed it was a very bad material every where, and he thought that nine-tenths of the slate roofs now in existence would have to be stripped off in less than a hundred years, owing to the perishable nature of the material.

Mr. Riddett, in supporting the motion, said that with regard to the question of pupillage, the fact should not be overlooked that pupils nowadays were only articulated for something like three years, and it was, he thought, generally understood that a pupil was merely to have "the run of the office," and to pick up what instruction he could. There was one practical reason for favouring small panes of glass in windows instead of large panes, viz., that the sash would of necessity be stronger, inasmuch as it would be framed in many parts instead of at the corners only. He agreed with other speakers in preferring tiles to slates, on account of their superior comfort and warmth for roofing purposes. Wherever possible, the Broseley tiles should be used. As to the comparison which had been drawn between church and chapel

architecture, it should not be forgotten that churches were planned with a certain amount of symbolism with regard to matters in which Nonconformists did not believe. Many people were of opinion that Mr. Spurgeon's Tabernacle presented a solution of the question as to the architectural treatment of a Nonconformist place of worship.

Mr. James Smith took exception to Mr. Masey's statement that the "old men," as a rule, were better constructors than the moderns. Mr. Masey had stated that no arch in old masonry was found in which there was not a joint at the apex. That was a mistake. Some years ago he (Mr. Smith) was told the same thing. It struck him then as being wrong, and he had since made particular observations on the point. He had found as many instances in old work in which the keystone was used in the arches as there were instances of the use of the joint at the apex. It seemed to him that the use of the keystone was the proper masons' way of doing it, and he had repeatedly heard masons speak of the joint at apex as a "joiners' method" of doing stonework. As to the argument that the old men were better constructors than we could be in the present day, it was notorious that the lantern at Ely and the spires of many and many an old church were banded with iron from top to bottom to prevent their coming down. The Medieval builders, in many instances, either did not understand how to make good mortar, or they did not trouble themselves to do so, relying more upon bulk than upon cementing the stonework together. Hence, in ancient rubble-work, 5 ft. thick, it was often possible to pick out "mortar" which was even now soft and yielding, like clay. On this account, it was often most hazardous to touch old work, for to interfere with one part would often be to bring down the remainder. He could not help saying, in conclusion, that he did not like the tone of Mr. Masey's paper. It seemed to be somewhat hyper-critical upon points upon which there might reasonably be tolerated a difference of opinion among men who had studied in different schools.

The Chairman having put the motion for a vote of thanks, it was carried unanimously, and Mr. Masey said a few words in reply to some of the points raised during the discussion.

## NEW STABLES FOR THE MARQUIS OF LONDONDERRY.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last the members of the Architectural Association made their first visit for the present session to buildings in progress, and inspected the extensive and well-appointed range of stabling, now approaching completion, for the Marquis of Londonderry, in Brick-street, Park-lane, adjoining Christ Church, Mayfair. Mr. James Brooks, the architect, very kindly received the visitors, and explained to them the chief points of interest. The buildings stand, he said, partly on the site of the duck-pond of the "Dog and Duck," a tavern which was the scene of much revelry in the times when a fair was held in the neighbourhood in the month of May, before the locality was closely covered with houses. The pre-existence of the duck-pond had given considerable trouble in the matter of foundations, and as, on a part of the site, there was a restriction against buildings being erected more than 12 ft. high, the whole area of the ground had been excavated 2 ft. or 3 ft., and the entrance placed in a different position to that which it formerly occupied. (The stables, it should be said, occupy the site of former stables.) The entrance is from Brick-street, through an arched gateway, which gives access to an irregularly-shaped quadrangle, round which the buildings are erected. On the right hand, after passing through the gateway, is a block containing, on the ground floor, four loose boxes, quite distinct from the rest of the buildings. The first floor of this block contains a commodious and pleasant mess-room for the use of the grooms and under-coachmen. This room is paved with tiles, and is provided with a kitchen and other conveniences. The room is intended to accommodate eight or nine men, each of whom will have a separate locker for containing his own provisions. The floor, like all the other overhead floors, is constructed on Dawson's freeproof system. The cooking for the men will be done in the mess-room by the coachman's wife. The coachman's suite of rooms occupies a portion of

\* A view of this building appeared in vol. xxvii. of the *Builder* (1879), p. 19.



the first floor of that portion of the building which faces Brick-street, and consists of a sitting-room (over the archway, and so planned as to enable the coachman, as the responsible man in charge, to have command over the entrance, and to be able, from the windows to have the oversight of what is going on in the yard), kitchen, and three bedrooms. These apartments are reached by an open stone staircase going up from the yard, and a balcony passing in front of them gives access to the men's mess-room. In a recess on the right-hand side, beyond the block containing the four loose-boxes, will be the coach-cleaning shed, very commodious, and well lighted by a skylight. In this shed, which will be enclosed by glazed gates of an ornamental character, the washing of the carriages will be done, irrespective of the weather. On one side of this shed are four bays, into which carriages, when cleaned, will be stood. This carriage-shed will be warmed, when necessary, by means of hot-water pipes. Adjoining this carriage-shed will be the harness-rooms, &c., and then come two more loose-boxes. The whole western side of the buildings is divided into two ranges of stall stables, each range consisting of six stalls, with a horse-cleaning shed in the centre, so that a horse can be cleaned under cover, and taken to its stall without passing out of doors,—a point to which considerable importance is attached. The stable fittings have been made to the architect's designs by Messrs. Muegrave & Co., and in them one or two specialities have been introduced, one of which is that, water being laid on to each stall, each horse is provided with a tip-up receptacle for its water, and these are so arranged as to be made available for the flushing of the gutters in the floors of the stalls. Special attention has been paid to ventilation and drainage, all drains being laid in straight lines converging to a man-hole in the yard. The remaining apartments on the upper floor consist of a dormitory for the men, each man having his own cubicle or compartment, and a wash-basin, with hot and cold water, &c.; saddle-room; and hay, straw, and corn stores. Altogether, the arrangements are very complete, and reflect credit upon the architect. Mr. Parrott is the clerk of works. The builders are Messrs. Patman & Fotheringham, their foreman being Mr. Fairweather. The principal materials used externally are red bricks, supplied by the Bracknell Brick and Tile Company, and Corsehill stone. All the woodwork, including doors, is in teak. All the steps and landings are of Scotchgate Ash stone.

#### THE MERSEY TUNNEL.

This most important engineering work, intended to connect the ports of Liverpool and Birkenhead, and recognised to be of the highest commercial consequence, is, after an intermission of several years, now being energetically pushed forward. Shafts have been sunk both on the Liverpool and Birkenhead sides, and the heading is being driven under the river.

So far, the rock on both sides of the river promises well for the success of the work; it is in both cases the "pebble beds," or the middle division of the Bunter, and, speaking from personal knowledge, I can testify to its compactness and strength. A considerable quantity of fresh water has, of course, been met with, the pebble beds of the Trias being the water-bearing rocks of the neighbourhood in which most of the public wells are sunk.

Ample engine-power, capable of lifting 650,000 gallons per hour, has been provided: so little difficulty may be apprehended in dealing with the water. The driving of this tunnel, as well as being of consequence to the trade of the city of Liverpool and Birkenhead, will solve some knotty points of special interest to geologists.

It is quite possible the pebble beds may be faulted between the two banks of the river, but it is not likely that any other members even of the Trias will be thrown in. If this be true, the probability is that so long as the tunnel is in the rock the rock will be compact and good; but now comes a question only the tunnel itself can settle.

In January, 1873, I read a paper before the Liverpool Geological Society, entitled "The Buried Valley of the Mersey," which was afterwards published, with diagrams, in their Proceedings. In this I showed, by a great number of well-borings, details of which are given, that a pre-glacial rock valley can be traced from Warrington to Widnes, 65 ft. below Ordnance datum

(mean tide-level at Liverpool), near to Warrington Bridge, and gradually deepening to 141 ft. below the same datum at Lambert's Copper Works. The borings at Widnes are so numerous that the actual form of the gorge can be traced out. This is remarkable and unexpected, as the river now runs not far off, through a channel under the Rancorn Bridge, the rocky bottom of which is only some 20 ft. below Ordnance datum.

The old channel in the Glacial period became entirely filled and obscured with marine drift, mostly boulder-clay, almost like the new red marl in consistency, and is, I believe, principally derived from it. After the re-elevation of the land from the glacial submergence, the river appears to have taken its present course. That this pre-glacial rocky gorge was a true river valley, and not a lake-basin, appeared to be proved by the absence of anything approaching to the character of lacustrine deposits and the presence of travelled stones, many from the Lake District, of the usual drift character, in the lowest bed, viz., red sand, lying upon the rock itself.

From reasoning it will be too great a draught upon your valuable space to detail here, I came to the conclusion that this rocky gorge most likely exists filled up with drift, probably boulder clay, below the river bed, which is about 60 ft. below Ordnance datum, between Liverpool and Birkenhead.

It is now nine years since the paper was written, and subsequent observation has not tended to disturb these views. At the end of 1879 and beginning of 1880, Messrs. Bateman & Hill, acting for the Upper Mersey Navigation Commissioners,\* who were under the impression that a ledge of rock existed between Hale Head and Weston Point, made a very complete set of borings across the river on this line, with the result of coming across, instead of a rocky shoal, a river channel filled up with sand and gravel, having in places almost perpendicular cliffs, and being in the deepest part 30 ft. below Ordnance datum. This was probably a branch of the larger and deeper gully I have previously described. Again, at the Atlantic Docks, at the north end of Liverpool, carried out by Mr. G. F. Lyster, the engineer to the Dock Board, the removal of the boulder clay disclosed a branching gully in the solid rock, 35 ft. below Ordnance datum. In some investigations I made for a proposed cemetery at Wallasey, I found that a banded rock cliff existed near the shore, west of the Red Noses at New Brighton.

It is well known to be difficult to trace the form of underlying rocks by borings, and proverbially foolish to "prophesy before you know," but whether my surmise prove to be correct or not as to the position of the pre-glacial course of the river Mersey, it is evident to me, from facts detailed, together with others I am in possession of, that the pre-glacial subaerial features of this formerly rocky country are wonderfully preserved beneath a thick covering of boulder clay, which has levelled up and obscured the former irregularities of the ground.

My sympathies as an engineer and native of Liverpool are entirely with the enlightened promoters of the work, and I conceive that no insuperable difficulty will be encountered,—no difficulties but what can be surmounted by the engineers in charge, Messrs. Brunles & Fox.

T. MELCARD READE.

#### THE CIRCULAR RAILWAYS OF BERLIN AND VIENNA.

SIR,—I was much struck on my return from Berlin a few days ago to see your illustration of the Vienna Circular Railway Central Terminus, having just passed through the city without having heard of the project. When this magnificent scheme is realised Vienna will be indeed a wonderfully handsome city.

Since the Great Exhibition there, vast improvements have been effected, and a series of monumental buildings have been constructed along the whole line of the Burg and Franzens Ring, on the site of the old military parade-ground, which has now been laid out for vast ranges of highly ornamental public and other buildings, rapidly approaching completion.

On the Franzens Ring, near the charming Votive Church, are Perott's extensive new University Buildings, Schmidt's elegant Gothic Rathhaus, and the adjoining blocks. Then the new Parliament Houses in the Grecian style with

\* I am indebted to Mr. Hill, Major Cross, and Admiral Spratt, for this information.

columnar ranges, to be richly coloured and gilt; and the new Palace of Justice. On the Burg Ring, and opposite the Palace, are the Natural History and other Museums, in the Renaissance style. *Vis-à-vis* to the Rathhaus, on the other side of the Ring, the new theatre is rising. The great barracks are at each end of the Ring, next the Donau canal.

The Industrial Museum and School, after the model of South Kensington, are in the Stuben Ring. And noble buildings for commercial and residential purposes support the public buildings, and give to the whole an air of palatial magnificence and civic opulence.

In Berlin, the Circular Railway is an accomplished fact; at least, it is rapidly approaching completion; and a lesson might be taken from its treatment to show how railway works may exist in a town without being the eyesore they are in this country. It is true that this is a State project, originating in military foresight, and therefore cannot fairly be compared with private enterprises.

The arches over which the line runs are ornamentally disposed, and are in part already let. I lunched in a restaurant occupying some half-dozen arches, but fitted up internally so as to entirely disguise the form of the arches, being lined with ornamental woodwork and decorative painting, each arch being divided by posts into nave and aisles, with arcades, and curved roofs, and recesses, &c. The walls are of brick, faced with terra-cotta mouldings, and ornaments, and face bricks.

Berlin has of old been famous for its terra-cotta brick-earth, and some of the old houses still remain. It is a material now much used. The new chemical, physical, and physiological laboratories are all faced in this way in very rich red and deep buff tints. The vast new Rathhaus, and the new Post-office in course of construction, are also examples.

Professor Hofmann's laboratory has been erected some ten or twelve years, and so little has it been affected by weather or soot that I mistook it for an entirely new building.

The carefulness of the manufacture, and the truthfulness of the leading lines, show a better capacity for firing and cooling the material, and that the Berlin manufacturers are ahead of us in this matter.

The invariable delays caused by the introduction of terra-cotta over here are avoided there by running up the brickwork independently of the terra-cotta facing, leaving 2½-in. toothing every alternate course throughout for the reception of the facing as it is forthcoming; by this means the interior finishings and the exterior facings are simultaneously carried on. A good wide joint is left, which is not pointed, but deeply struck as the work proceeds, causing each brick to have a shadow line round it, which has a better effect than similar work in Munich, where the joints are as fine as gauged work, and a general flatness of effect is the result. It is much to be regretted that so many difficulties surround the use of terra-cotta in this country. The Natural History Museum at South Kensington sufficiently testifies to its suitability for use in London from its non-absorbent qualities.

EDWD. C. ROBINS.

**The New Tramp Wards at Lynn Workhouse.**—For a period of twelve years the attention of the Lynn Board of Guardians has been given to the question of the advisability of erecting a range of tramp wards separate from the workhouse, with improved means of dealing with the vagrant community. Last year it was finally resolved to provide what was required, and in August the tender of Mr. P. H. Dawes to build them, from plans of Messrs. Adams & Son, architects, for 1,085l. 16s. was accepted. The works were proceeded with immediately, and the wards are now nearly complete, and in a few days will be ready for the reception of vagrants. The length of the buildings, which are built at right angles with the west end of the workhouse, is 130 ft. They are of red brick, and comprise coach-house, refractory-ward, male and female receiving-wards, clothing-store, female and male vagrant-wards, boiler-shed, and clothes-drying house, sleeping-cells, then the stone-breaking yard, and a mortuary. The heating-apparatus was supplied and fitted by Mr. James Plowright, of Railway-road; the gas-fittings by Mr. Chadwick, of High-street. A great deal of the work has been done by the inmates of the house, who, it may be added, execute most of the repairs, additions, and improvements on the workhouse premises.



EDINBURGH ARCHITECTURAL  
ASSOCIATION.

The usual fortnightly meeting of the above Association was held last week, the president, Mr. M'Lauchlan, in the chair.

Mr. James Annan read a paper on "Cements," in which, after a brief reference to Smee's investigations of the properties of different kinds of lime preparatory to building the Eddystone Light-house, he noticed the discovery of the so-called Roman cement by Parker, and the experiments of Vicat in France and of Pasley in England, then the invention by Aspin of Portland Cement in 1826, and called attention to the very slow progress which this material made in public favour during the following thirty or forty years. He also dwelt on the investigations made for the Metropolitan Board of Works by Mr. Grant, who had, perhaps, done more than any one in this country to raise the quality of Portland cement, and described the materials of which this cement is made, with a short account of its manufacture, and illustrated his remarks by exhibiting samples of Portland cement in the varying proportions of its ingredients, to show how in colour, specific gravity, and setting undue proportions of the ingredients produce different results. The different characteristics of good cement, the various ways of testing the same, and the machinery therefor now in use, were next described, and, in conclusion, the lecturer spoke of the utility of cement, and expressed an opinion that its use is increasing rapidly, and is likely to continue to do so.

A vote of thanks was accorded at the close of the proceedings.

BRISTOL AND CLIFTON  
JUNIOR ARCHITECTS' SOCIETY.

The first annual meeting and distribution of prizes in connexion with this society took place last week, Mr. C. F. Hansom, the president, in the chair.

The Secretary (Mr. Wm. E. Hill) read the annual report, which congratulates the members on the success of the society, and recapitulates much useful work done in visiting buildings and in the reading and discussion of papers. The drawings submitted in competition for the prizes offered were exhibited. The referee, Mr. W. E. Jones, awarded the prizes as follows:—

In competition No. 1, for members who have been connected with the profession more than two years,—to Mr. E. Milverton Drake, of Park Villa, Clevedon, five years in the profession, for drawings of Yatton Church, Somerset. In competition No. 2, for members who have been connected with the profession less than two years,—to Mr. H. T. Edwards (in the office of Messrs. Trew & Sons), for the profession six months, for drawings of Long Ashton Church. On the recommendation of the referee, a second prize, kindly given by the President, was awarded in No. 1 competition to Mr. S. Fudge (in the office of Mr. J. Y. Sturge, of Thornbury), for drawings of St. John's Church, Bristol; and the Council also awarded in No. 2 competition an extra prize to Mr. A. H. Fawn (in the office of Mr. Alfred Harford), for drawings of St. Peter's Church, Bristol.

The report expressed thanks to the Council of the Fine Arts Academy for allowing the society to meet in the room occupied by the former Bristol Society of Architects fourteen or fifteen years ago, and stated that, with the consent of the members of the old society, the Council of the Academy will hand over to the new society the architectural library formed by the old society. The new society now consists of 20 working members, 13 architect members, seven honorary members, and 25 patrons.

The financial statement, presented by the treasurer (Mr. George E. Ford), was satisfactory. On the motion of the President (seconded by Mr. J. C. Moncrieff, vice-president), the report and balance-sheet were adopted.

The President expressed the hope that the profession would support the society liberally, so that increased rewards might be given to promising students. The idea was to form a portfolio of drawings of buildings of interest in the neighbourhood, and they had made a good beginning in those of Yatton Church by Mr. Drake. He more particularly hoped that Mr. Drake would supply the sections. His work showed great industry and skill.

Mr. Drake said he should be happy to comply with the wish of the president.

The President said that in future he would give a prize that would induce the competitors to hand over the original drawings to the society.

## VACANT DISTRICT SURVEYORSHIPS.

## PROPOSED PROMOTIONS.

At the meeting of the Metropolitan Board of Works on the 27th ult., the Building Act Committee reported that they had further considered, in pursuance of the resolution of the Board of the 13th ult., the question of the transfer of district surveyors who had been for some time in charge of less remunerative districts to others of greater value which might become vacant. The carrying out of a general system of promotion, affecting many districts of the metropolis, on the occasion of every vacancy, would probably be inconvenient to public business, and therefore undesirable. At the same time the committee considered it important that the principle of the possibility of promotion among these officers should be distinctly recognised by the Board. They therefore recommended that they be authorised, from time to time, to report to the Board in any case where in their opinion a vacant district should be offered in the first instance to one of the existing district surveyors.

This recommendation, after some discussion, was agreed to, Mr. J. E. Saunders, the chairman of the committee, incidentally stating that while, under the present system, old and experienced officers were kept in unremunerative districts, other and untried men, almost by mere accident, obtained sometimes as much as 1,000*l.* a year as soon as they were elected. Mr. Runtz stated that one of the districts at present occupied realised 3,000*l.* a year, another 2,500*l.*, and another 2,200*l.*, and as vacancies occurred the Board sought to equalise the value of the districts.

The Committee further recommended that they be authorised to offer the vacant districts of West Wandsworth, and of East Wandsworth and Tooting Graveney, to Mr. G. Aitchison, district surveyor of Woolwich, and Mr. T. Roger Smith, district surveyor of St. Saviour's, Southwark, &c., and to report the result to the Board.

The two gentlemen named were stated to be occupants of the two least remunerative districts.

After some further discussion the matter was, on a point of order being raised, referred back to the committee.

## CLIFTON COLLEGE CHAPEL.

The Guthrie memorial chapel at Clifton College was originally built to accommodate 400 boys. The school, however, soon grew beyond this limit, and by the use of chairs and temporary seats the chapel was made to hold rather over 500 boys. This, however, has of late years been an inadequate provision, and more than 100 boys have been unable to find seats in the chapel. Funds were for some time wanting to carry out the enlargement. But the Clifton College Completion Fund, started by friends of the school, shortly after the charter was obtained, provided part of the amount required; and the rest has been collected by the headmaster from the parents of boys now in the school. It was decided by the Council that the enlargement should take the form of two aisles. The north aisle is now finished, and the chapel was re-opened for service on the 21st ult., when the school re-assembled. By the use of temporary seats and chairs in the chancel and nave it is possible now to accommodate nearly all who wish to attend; but the chapel will be inconveniently crowded until the south aisle is also built.

The new aisle is 61 ft. 6 in. long by 11 ft. 6 in. wide, occupies five bays out of the seven into which the chapel is divided, and is separated from the nave by an arcade of moulded stone arches, supported by polished red granite monoliths 10 ft. long by 1 ft. 6 in. in diameter, surmounted by richly-carved capitals. The hood or label moulds of the arches are stopped by sculptured corbels representing angels playing various musical instruments; from these corbels spring red stone shafts, with moulded bases and carved capitals supporting the arched principals of the roof. Each bay or division of the aisle wall is separated by a red stone shaft detached from the wall, with moulded bases and bands and carved capitals, forming a support to the other half of the roof principals. The windows are of two lights, with tracery heads, and filled with rich grisaille or ornamental glass. Under the window is a continuous arcade of red stone, divided into panels by deeply-cut mouldings and tracery heads, the intervening spandrels being carved with varied foliage. Below this is a dado

of oak and walnut, having a continuous line of trefoil tracery panels. The windows have been enriched by the addition of moulded jambs and arches of freestone, with red stone shafts inserted in the jambs and finished by carved capitals. A band of carved foliage along the wall connects the capitals of the several windows together. The roof of the aisle is panelled in pitch pine, and it is proposed to do the nave roof also in wood, in place of the present plaster ceiling. One bay of the nave roof has already been done, with marked improvement.

The new benches are of oak and walnut. The sculptures and carvings are by Mr. R. L. Boulton, of Cheltenham; the capitals are careful studies from best examples of the period (fourteenth century), principally from Ely Cathedral. The glass is by Messrs. Lavers, Barrand, & Westlake, of London. Messrs. Wilkins & Sons, of Surrey-street, St. Paul's, Bristol, were the contractors for the building. The stalls, dado, and benches are by Messrs. Lewis & Edbrook, of Clifton-vale. The clerk of works was Mr. John Perrott. The gas chandeliers were supplied by Messrs. Verity & Son, of King-street, Covent-garden, London; the hot air apparatus at the east end by Messrs. Hudson & Son, engineers, of Trowbridge; and the hot-water apparatus applied to warming the ante-chapel by Mr. Skinner, of Stoke's-croft, Bristol. The organ has been considerably enlarged by Mr. Vowles, of St. James's-square, and now stands in a recess in the centre bay of the new aisle; the original position was at the north-west angle of the chancel. The old organ-chamber has been removed and a window agreeing with the rest of those in the chancel built up in its place.

The work has been designed and carried out under the personal superintendence of Mr. Chas. Hansom, of Clifton, the architect of the college, who for upwards of twenty years has been engaged on this work.

## STATUES AND MONUMENTS.

*Darlington.*—The executors of the late Mr. Robert Henry Allan having instructed Mr. Pritchett, architect, of Darlington, to prepare a design for the proposed monument in the West Cemetery, have now accepted the tender of Messrs. Priestman for its erection. The monument is in the form of a cooped tomb, 8 ft. by 3 ft. 6 in. by 4 ft. 6 in. high, all of polished Aberdeen granite. The base and cover are to be each in one massively-moulded block, and the sides and one end are relieved by arched work of Transitional style, the shafts being of red granite, with moulded bases, and having carved caps and moulded arches, all like the rest of the tomb, of the variety known as dice granite, from its black and white marking. The other end will be occupied by a shield, containing the coat of arms, surmounted by his crest, all embossed in solid granite.

*Liverpool.*—The model sketch of the Liverpool memorial statue to the Earl of Beaconsfield has been completed by the artist, Mr. C. B. Birch, A.R.A., and was on view at Mr. Birch's studio last week. The statue will be cast in bronze, and will be 10 ft. in height, and stand on a pedestal of granite and bronze, 12 ft. high. The late earl is in the uniform of a Cabinet minister, over which is the long flowing drapery of a peer's robe. His lordship is represented in a standing position, with his left hand as if easing the drapery, and his right hand by his side. The total cost of the memorial will be 2,200*l.* The statue is to occupy a position in front of St. George's Hall.

*Alleged British Urn found in Suffolk.*—An interesting discovery is reported to have been made by Dr. J. E. Taylor, in a field adjoining Spronghton Church, where excavations are going on to obtain stone for road-making. It is described as a fine British urn, which was embedded in the gravel. The urn measures in height about 18 in., and its diameter is about 12 in. It is of rude workmanship, and of the kind formerly termed Romano-British, but now believed to be of purely aboriginal workmanship. The outside of the urn is ornamented with zig-zag scratches. Inside the urn were the remains of bones which had been partially incinerated. The urn has been taken to the Manor House, Spronghton. This is said to be the first discovery of any such remains in the particular neighbourhood mentioned.



### THE PROPOSED INTERNATIONAL EXHIBITION AT BERLIN.

ALTHOUGH there have been numerous local, provincial, and special exhibitions in many of the chief towns of Germany, that empire has never yet had one really Universal International Exhibition in the whole course of the history of such shows ever since the opening of the World's Fair in Hyde Park in 1851, about thirty-one years ago. In the whole of civilised Europe, Berlin is the only city of its size,—it has more than a million inhabitants,—which has allowed the first generation of modern Universal Expositions to pass away without ever having had the courage to venture on such an enterprise for herself. Yet there is no doubt a very strong feeling prevails in that capital and in all parts of the empire that Germany should at length have her first Universal Exhibition. At the last Congress of the German Chambers of Commerce, held a few weeks ago in Berlin, a resolution was passed by a very large majority in favour of the realisation of this long-deferred project. In the various organs of the press numerous and powerful voices have been raised, especially quite recently, in favour of the scheme.

In Germany, however, almost everything depends on the Government, and it is confidently anticipated that a General International Exhibition at Berlin would be laid out on such a scale that a financial deficit would be a certainty, there is no chance of carrying out the idea until the Government takes it up, it being apparently accepted as a principle by all parties that the Government is the right party to bear the loss. One gentleman who recently in the *Gegenwart* advocated the adoption of the system of private guarantors as in England, if the German Government refuses to take up the matter, has found no response to his appeal.

On Friday in last week the subject was brought up in the Imperial Parliament of Germany, and a question was put in order to extract from the Government a declaration of its intentions. The reply on behalf of the Imperial Ministry was given by Herr von Bottecher, the Secretary of State for the Interior, who threw cold water on the proposition.

The result is that the project of an International Exhibition at Berlin is postponed, if not *sine die*, at any rate for a long time to come.

### BAGSHOT CHURCH.

THE long-pending competition for this church appears now to be definitively settled, a public meeting for the purpose having been held on the 13th of January, when H.R.H. the Duke of Connaught took the chair, and the plans of Messrs. Bromfiel & Cheers, of Liverpool, were finally selected, upon their guarantee that the cost should not exceed 3,000l. The design of Mr. T. Goodchild, F.R.I.B.A., was placed second, and that of Mr. Barry, of Liverpool, third; and the sums of 100l. and 50l. respectively were specially awarded to those gentlemen. Twenty sets of plans in all were received, a selection of which was submitted to her Majesty at Balmoral.

### NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

THE fourth annual meeting of the Association took place on Wednesday, the 25th ult., at the Great Western Hotel, Birmingham, the President, Mr. Stanley G. Bird, in the chair.

The report and balance-sheet for the year, having been read, the President congratulated the Association on the peaceful relations at present existing between the employers and their workmen. Notice for an advance has been received at one town only, viz, Belton, but it was hoped the difference would be settled amicably, although there would be no difficulty in the case of a strike in sending any number of men through the agency of the Association, owing to the continued depression of trade in other towns.

The President stated that the efforts of the Association had borne, and continued to bear, good fruit by the great and increasing demand for the forms of conditions of contract.

The builders are very anxious that a conference of architects, surveyors, and builders should be held shortly to consider the question of improper quantities, forms of tender, provisional amounts, &c.

A deputation from Maccolesfield informed the meeting that the corporation of that town were seeking Parliamentary powers to enable them to become a trading body. A sub-committee was appointed, with full power to petition Parliament, and take steps to resist the application.

The President reported that he, accompanied by Mr. Hughes, of Liverpool, had paid a visit by invitation to Glasgow and Edinburgh. The meeting was very successful and there is every prospect that the Association would be in fact, what it was in name, "The National." The Builders' Accident Insurance Company, which had been established under the auspices of this and kindred associations, had been very successful in its operations, and it was anticipated that at the first annual meeting they would be able to announce a substantial bonus. The company was essentially a mutual one, managed by builders for the benefit of the trade generally, and he trusted that it would receive the support which it deserved.

The meeting then proceeded to the election of a strong representative council, re-electing the president and other officers. The meeting, which included representatives from upwards of fifty local associations, was very unanimous.

In the evening, the Birmingham Builders' Association entertained their visitors, their president, Mr. Barker, occupying the chair.

### BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-fourth annual ball in aid of the funds of this Institution, was held at Willis's Rooms on Thursday, the 26th ultimo, and was very numerously attended, about 360 persons being present. We may therefore hope the charity will materially benefit by it. It was generally considered to be one of the best balls that has been given since the foundation of this Institution, and great credit is due to the secretary, Major Brutton, for the admirable way in which all the arrangements were made and carried out by him. As usual, the band, under the direction of Mr. Dan Godfrey, played all the latest morceaux with its accustomed precision and "go." Amongst those present, with their parties, were Mr. Ex-sheriff Burt, Mr. J. T. Chappell, Mr. F. J. Dove, Mr. A. Thorne, Mr. S. G. Thacker, Mr. G. Jennings, Mr. R. Conder, Mr. T. Stirling, Mr. H. Colls, Mr. J. Pearson, Messrs. Donlton & Co., Messrs. Casselton Brothers, Messrs. Cliff & Sons, Mr. J. T. Bolding, Mr. C. Russell, and others.

### THEATRES.

THE site of the theatre proposed to be erected on the site of No. 8, Great Queen-street, Lincoln's-inn-fields, and premises in Parker-street in the rear, has been scheduled by the Central Metropolitan Railway Company, who propose to construct an underground line from Charing-cross to King's-cross.

The Royal Avenue Theatre, which is rapidly approaching completion, has been scheduled by the South-Eastern Railway Company, together with the whole of the houses on the east side of Craven-street, Strand, for the purpose of widening their terminus at Charing-cross.

Theatres appear to be a favourite means of investment at the present time, and the absorption of these sites will lead to demands for other sites for the purpose of erecting theatres thereon.

**Kensington Artists.**—The *Ratespayer* says,—The Kensington Town-hall is about to be used by the inhabitants for an eminently useful purpose. The clerk to the Vestry at the last meeting reported that an application had been made to him by Mr. Bird, an artist, of Sussex-gardens, South Kensington, for the use of the Town-hall for two days, for the purpose of exhibiting pictures painted by Kensington artists, prior to their being sent to the Royal Academy. It was expected there would be thirty or forty pictures, and each artist would provide his own easel for his picture, so as to obviate the danger of any damage to the building. Major-General Boleau strongly urged that the use of the hall should be granted for so admirable a purpose, and moved accordingly. Mr. Freeman seconded the motion, suggesting that the hall should be allowed for two days for fifteen guineas, the ordinary price for that period being thirty guineas. The suggestion was incorporated in the motion, and carried.

### EASTBOURNE SANITARY EXHIBITION, 1881.

At a meeting of the Council, held at Trinity House on the 26th of January, 1882, Dr. Jeffery, president, in the chair, the following list of exhibitors who have received medals awarded by the judges was read by the treasurer, Mr. Schmidt, who also reported a balance of 43l. 13s. 7d. in hand, after paying all outstanding debts. A fresh balance-sheet was ordered to be printed.

**Silver Medallists.**—Messrs. Robt. Adams, D. T. Bostel, Ramer Bros., R. Boyle & Son, S. Bradford & Sons, J. T. Constantine, U. Clarke, Chorlton & Dugdale, Drake & Co., Davis & Co., Doulton & Co., Ellison, Fisher, Dick & Co., W. Hamilton, Geo. Jennings, Lascelles, J. W. Parrett, Payrolite Company, Ritchie & Co., Ridge & Co., E. Rimmell, F. W. Reynolds, Steven Bros. & Co., C. R. Stevens, W. Stobbs, J. A. Skinner, Silicate Paint Company, Sunlight Stove Company, Spence's Metal Manufacturing Company, Wm. Sugg & Co., Sanitary Engineering Company, A. J. Simmons & Son, F. G. Underhay, A. Walker, Walton & Co., Wilson Engineering Company, J. Wright & Co.

**Bronze Medallists.**—Messrs. Ballinart, Tagliafaro, & Co., R. R. Gibbs, Illee & Horne, Jones & Son, Kite & Co., Manchester Water Meter Company, Packham & Co., Ransome & Co., J. A. Skinner, Sharp, Jones & Co., S. D. Sanby, Voss & Co., and H. C. Webb.

### ARCHITECTS' FEES.

EMDEN V. YOUNG.

In the Lord Mayor's Court, before Sir W. T. Charley, Q.C., Common Sergeant, and a jury, the plaintiff, who is an architect, sued the defendant, Mr. W. W. Young, solicitor, for 9l. 8s., being his charge at the rate of three guineas a day for three days' attendance at Westminster to give evidence in an action brought by Mr. L. R. Reynolds, for whom the defendant was acting as solicitor.

Mr. L. Hart, instructed by Mr. Tudor, appeared for the plaintiff; and Mr. Fulton for the defence.

The plaintiff stated that he stipulated for being paid his fees before going into the witness-box, and the defendant undertook to be personally responsible for them. He had taken the same course in previous cases, and the defendant had then paid him. In cross-examination he admitted that in defending an action brought against him by Reynolds he included the nine guineas in a counter-claim by mistake, but he afterwards withdrew it. He denied that he never applied to the defendant for the fees until after Reynolds was arrested. On November 30th, a few days after the trial, he wrote to the defendant for the fees, "as arranged," and the defendant replied, "You must please let your fees for attending a subpoena stand over until the completion of the matter." The defendant swore that he did not promise to be personally responsible for the fees, and stated that his reply to the plaintiff when he applied to him for them, and said he should decline to give evidence until he had his fees, was "You will do as you please." He heard no more of it until the following September, when he received a letter from Mr. Tudor, and at that time Reynolds was actually committed for trial. Up to the time of his arrest he was a man in good position, and the plaintiff had planned a house for him at Hampstead, which was to cost 3,000l. If the plaintiff had refused to give evidence it would not have prejudiced his case, because he found that the plaintiff's evidence was unreliable. He had said that Mr. Pries Williams had trespassed upon Reynolds's ground 2 in., but when it was surveyed by Mr. Edmonstone it was found to be nothing of the kind. The other fees which he had paid to the plaintiff he did not pay until after he had received the money from Reynolds.

The Common Sergeant, in summing up the case to the jury, remarked that the probabilities of the case were strongly against the plaintiff, as it was very unlikely that a solicitor would become personally liable for fees. The jury returned a verdict for the plaintiff for the full amount claimed.

### CASE UNDER A LOCAL BUILDING ACT.

A CASE of some importance to builders came before the Stipendiary Magistrate at Birkenhead, last week. Mr. John Thomas, a builder at Birkenhead, was summoned by the Borough Surveyor for contravening the provisions of the Birkenhead Improvement Act. Mr. Wain, the town clerk, appeared in support of the summons, and Mr. Dodd, barrister, represented the defendant. From Mr. Wain's opening statement, and the evidence of Mr. Richardson, the building surveyor, it appeared that the defendant had built an outside wall to certain new premises, 9 in. instead of 14 in., as provided by the Act. In cross-examination it was admitted that the wall appeared in the plans submitted to the Corporation, and approved in September last, as only 9 in. thick, and that, although the witness was frequently on the building during erection, and must have seen the wall, he never suggested that it was wrong until December, when



the roof was on, and when the wall could only have been thickened at considerable expense. It also appeared that out of a total length of about 33 ft. only 6 ft. were not in accordance with the regulations. No suggestion was made that the wall was at all unsafe, or that the work was not properly done according to the plans. The Magistrate held that the case came within the 48th section of the Act, and that the defect had been allowed by the inattention of the surveyor or his assistant. Judgment was therefore for the defendant.

#### THE GERMAN PARLIAMENT HOUSE.

The Bill passed by the German Parliament providing for the immediate commencement of preparations for the erection of the new Imperial Parliament House, grants the sum of 7,775,000 marks, or 388,750*l.* sterling, for the purchase of the site. The measure ordains that, "the preparations for the structure shall be conducted in such a way that the site shall be ready for the commencement of the building operations not later than the spring of 1883." In the interval of fourteen months which will thus elapse before the foundations are begun, it is hoped by many of the architectural profession, especially by the Berlin architects, that the authorities will open a new competition for the definitive plan of the new building. As the site now fixed on is smaller than that originally contemplated, it will be necessary, if it is determined not to re-open the competition, to modify Professor Bohstedt's design, which gained the first prize in the competition about ten years ago. But it is thought by many that, as there is plenty of time, it would be advantageous to make the whole design matter of general competition again. Professor Bohstedt and his admirers naturally strongly object to this proposal, which would violate the original understanding, according to which the author of the successful design was to superintend as architect the erection of the new Imperial edifice. Another suggestion which has been urged is that if there is a second and final competition, it should be confined to those architects who were successful in the first contest. All of them, it is said, are still living, with the exception of the only foreign competitor who gained a prize—to wit, the late Sir Gilbert Scott. These questions will come before the Committee which has been appointed to conduct the proceedings connected with the purchase of the site and the demolition of the buildings at present standing upon it. There is as yet nothing to show how the Committee may be disposed to deal with the suggestion.

#### THE PARKES MUSEUM AND ITS FUTURE.

At a meeting of the Executive Committee of the Parkes Museum, held on January 27th, 1882, Professor Berkeley Hill in the chair, the honorary secretary, Dr. G. V. Moore, read a communication from the Council of University College, in which that body agreed, with some modifications, to proposals which had been made on behalf of the Museum in reference to the erection of a building for the Museum.

After a long discussion, in which Professor Berkeley Hill, Professor Hayter Lewis, Dr. W. R. Gowers, Professor Corfield, and Mr. Rogers Field, took part, the modifications suggested by the Council of University College were accepted; and it was resolved that steps should be taken to obtain the funds necessary for carrying out the scheme, which embraces (1) the building of an addition to the north wing of the College for the purposes of the Museum; (2) an endowment for the maintenance and management of the Museum; (3) the Museum to be opened free to the public, and to be placed on a somewhat similar footing to the North London Hospital, i.e., to be autonomous, with due representation of the Council of University College on the Executive Committee of the Museum.

It is estimated that 30,000*l.* is the sum that will be required to thus permanently establish the Museum as a national institution. Towards this Mr. Thomas Twining, of Twickenham, had written to say that he would subscribe the sum of 100*l.* if 100 promises of a similar amount were obtained. Subscriptions may be paid to the account of the Parkes Museum at the Union Bank, Argyll-place, Regent-street.

We feel bound to say that we should prefer to see the Museum of Hygiene in a building of its own, and situated less far north than Gower-street.

#### BUILDING PATENTS.\*

##### APPLICATIONS FOR LETTERS PATENT.

294. G. H. Nassey & W. B. Leachman, Leeds. Apparatus for heating water, &c. Jan. 20, 1882.  
 295. S. H. Torry, Whitehall. Water-closets and urinals. Jan. 20, 1882.  
 317. J. Holroyd, Leeds. Sanitary trough closets. Jan. 21, 1882.  
 324. H. M. Ashley, Knottingley. Kitchen ranges, &c. Jan. 23, 1882.  
 326. O. Seefeldt, London. Stamped metal roof tiling. (Com. by H. Klehe, Baden-Baden). Jan. 23, 1882.  
 344. S. H. Bevan, Neath. Bonding roll roofing-tiles. Jan. 24, 1882.  
 351. J. Holroyd, Leeds. Tanks for flushing drains and sewers, &c. Jan. 24, 1882.  
 353. P. J. Davies, Kensington. Water-closets and latrines. Jan. 24, 1882.  
 355. W. J. Doubleday, London. Bottoms, gratings, or bars for fireplaces, stoves, &c. Jan. 24, 1882.  
 360. W. R. Lake, London. Supporting and balancing window-sashes, &c. (Com. by P. W. Blythe, Boston, U.S.A.). Jan. 24, 1882.  
 370. A. Cordingley, Bradford. Finishing the surface of concrete floors. Jan. 25, 1882.  
 379. W. Wright, Plymouth. Flush cisterns for water-closets, &c. Jan. 25, 1882.  
 385. G. Wolliscroft, Stoke-on-Trent. Utilising waste heat for drying bricks, tiles, &c. Jan. 25, 1882.

##### NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Jan. 24, 1882.

- 4,054. E. de Pass, London. Concrete materials for paving and building. (Com. by W. Hunt, New York, U.S.A.). Sept. 20, 1881.  
 4,115. F. Dyer, Camden Town. Flood valves for drains, &c. Sept. 23, 1881.  
 4,187. G. W. Wigner and R. H. Harland, London. Heating water by gas for baths, &c. Sept. 23, 1881.  
 4,590. F. Wirth, Frankfurt. Chimney flues. (Com. by the Gesellschaft des Emser Blei- und Silberwerks, Ems, Germany.) Oct. 20, 1881.  
 4,598. G. P. H. Sutton. Water-closets. (Com. by J. Finck, Baden-Baden.) Oct. 20, 1881.  
 4,603. T. E. Clarke, Minehead. Fire-grates. Oct. 20, 1881.  
 5,365. J. Barr, Kilmarnock. Self-closing cocks and valves. Dec. 8, 1881.

Jan. 27, 1882.

- 4,081. J. Challender, Manchester. Safety-valves for water-heating apparatus. Sept. 22, 1881.

##### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending January 29, 1882.

528. P. Gay, Paris. Machinery for sawing or cutting stone, &c.

An endless wire is used, which is passed round pulleys. These are caused to revolve very rapidly so as to give the wire great speed, and, by the application of sand and water to the stone, it is cut through very fast. Feb. 7, 1881. Price 6*d.*

- 2,561. C. H. Pennycook, Glasgow. Bars for holding and securing glass for windows and roof-lights, &c.

This is an improvement on Patent No. 1,930 of 1875. The bars have an inner core of inverted T-section, a shell of sheet metal to give an external form to the bar and rest the glass on, and a finishing part of sheet-lead for holding the glass down. June 15, 1881. Price 6*d.*

- 2,624. W. T. Sagg, Westminster. Gas-cooking stoves.

This relates to that class of stove in which the gas-pipe is placed outside the stove. Covered galleries are placed externally round the stove, in which are the gas-pipes with flat flame-burners. Guard-plates are fitted above the burners to prevent any dirt falling on them. June 18, 1881. Price 6*d.*

- 2,653. W. Barton, Boston. Stoves.

In pedestal stoves the metal air-tubes which pass through the fuel are protected by a casing of plumbago or Breyal, constructed in rings or short sections. The fuel is supported upon a combined grating and dead plate. June 17, 1881. Price 6*d.*

- 2,657. J. Gordon, Birmingham. Glass-holders of gaseliers and lamps.

Loose clips are pivoted to the arms, which have a hook at one end and at the other a balance-weight, which keeps the hooks against the lower edges of the glass. June 17, 1881. Price 4*d.*

- 2,662. A. M. Clark, London. Manufacture of cements and compositions.

These are made of magnesia and sulphate of magnesia combined with water or sand, or various clays or ochres.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

(Com. by E. E. A. Sorel, de la Société Générale des Agglomérés Magnésiens, Paris.) (Pro. Pro.) June 15, 1881. Price 4*d.*

- 2,714. E. J. T. Digby, Hammersmith. Substances or clay for manufacture of various articles of utility or ornaments.

This is an improvement on Patent No. 2,377 of 1891, in utilising the precipitate which is deposited from the treatment of washed and powdered oyster-shells by saluboric or acetic acid, which is mixed with water and made into a clay. The shells are left twenty-four hours in the water, then ground and deposited in the acid for twenty-four hours. Water is afterwards added, and the deposit, after the lapse of twenty-four hours, is the clay. June 21, 1891. Price 4*d.*

- 2,748. H. H. Lake, London. Pavements, &c.

The base is constructed of blocks of concrete, of right-angled parallelepiped form, laid in such a manner that the upper paving blocks will each bear on three or more of the base blocks. These upper paving-blocks are of concrete, with bevelled edges, so as to form V-shaped channels running at right angles to each other. A layer of sand may be laid between these two sets of blocks. (Com. by D. McLean, New York, U.S.A.) June 22, 1891. Price 6*d.*

- 2,763. W. B. Bryan, Blackburn, and A. Fryer, Wilmslow. Water-closets, &c.

These closets are flushed by a self-acting tipping tank, which is of rhomboidal form, and has a diaphragm so arranged as to increase the scour of the water at the bottom of the pan of the closet. (Pro. Pro.) June 24, 1891. Price 2*d.*

- 2,813. E. Lee, Leeds. Producing designs on surfaces of earthenware tiles, &c.

These designs are produced by taking impressions from the engraved blocks on to blocks with a face of yielding or elastic material and setting-off the impressions from these on to the surfaces to be decorated. The hard lines of the designs are "broken up," and a "toiled" appearance produced by rolling a cylindrical brush over the surface while the varnish is fresh. June 27, 1891. Price 4*d.*

#### PRIVILEGED AND UNPRIVILEGED CABS.

SIR,—I am desired by the cabdrivers of London to return to you their very sincere thanks for the admirable article which appeared in your journal of the 21st ult., and we hope it may be the means of eliciting some expression of public opinion, and so bring to an issue this most grievous and long-pending question.

When we see a universal complaint against cabs and cabmen, we may reasonably assume there is a cause; and this is not far to seek, for the railway privilege system is undoubtedly the root of all the evils in our trade; for, apart from the great injustice inflicted upon the unprivileged proprietors and drivers, and the double wear and tear to both horse and vehicle, there is still the fact that it retards all improvements in the four-wheeled cab, as the unprivileged proprietor will not put a better article in the streets, because he is only allowed the inferior work, which by itself does not remunerate him for the outlay; while, on the other hand, the privileged proprietors will make no improvement while the present old-fashioned affair bring them in such a handsome revenue; but if all shared alike, the beneficial influence of fair and open competition would be fully developed, and the public would be gainers thereby.

The public sometimes complain of our horses being tired; and well they may be tired, for if we drive five passengers and a heavy load of luggage from West Brompton to Liverpool-street Station, and then walk two miles in search of a stand, the horse may well be tired.

EDWIN REILLY.

#### THE LATE MR. STREET, R.A.

SIR,—It is proposed to place an altar-tomb with an effigy, or other fitting memorial to the late George Edmund Street, R.A., in the beautiful church which he built and gave to the parish of Holmbury St. Mary, where he resided. Believing that there are many people who will be willing to subscribe to such a memorial, may I request that you will kindly publish this letter in the columns of your paper.

JOHN SHARME.

Holmbury St. Mary Vicarage, Dorking.

**Peterborough.**—An Exhibition of "Industrial Art and Manufactures," under the presidency of the Right Hon. Earl Spencer, K.G., is to be held in Peterborough from the 17th to the 29th of April next. The exhibition will also include labour-saving and sanitary appliances, and articles of domestic use and economy. Considering that Peterborough has four railway companies running into it, and thus connecting it with all parts of the country, a large and attractive exhibition may be expected.



## SMOKE ABATEMENT.

SIR,—I have been looking over the *Builder* of the 28th ult., and read with interest the article by P. Hinckes Bird, F.R.C.S., on the smoke abatement nuisance,—a nuisance which dwellers in London, and all large centres, are especially desirous of mitigating, if not altogether blotting out. There is one patent in Block V, Smoke Abatement Exhibition, which has overlooked, and in which myself as a working man am especially interested. I can readily understand why it has been overlooked, inasmuch as it is in the Western Arcade, and with no outward show beyond two specimens, although the same principle applied to a Cornish boiler is shown in a large model. I allude to the exhibit of G. Hunter & Co., of Leeds. The patent, which relates to domestic grates, consists in introducing air through a chambered and perforated firebrick back (not bottom), the air from the back meeting the air from the front, causing the combustion of the smoke, and a clear fire is the result, the heat in addition being thrown towards the room. I have been given to understand that a practical test was applied last week, in conjunction with some patent ventilator, with favourable results. The price places it within the reach of all, whether speculating builders, tradesmen, or industrial classes; it is easily fixed,—a lump of fireclay being all that is required. No one can insure his fire being made up in any given mode, no matter how beneficial it might be, more especially the middle or industrial classes; one fire has to do all the work, and the fuel used that which can be procured most readily. The same rule applies to the costly grates, with elaborate tile fittings, these are embellishments and attractions, as an exhibition; but we want an article which can be readily applied to every grate without resetting or disturbing it in any way, and which shall be reliable as a sure preventive of smoke.

JAMES MAY.

## THE WATER-GATE AT YORK HOUSE.

SIR,—Many years since, when a contribution from the old students to the New St. Thomas's Hospital was mooted, I suggested the purchase, restoration, and re-erection of this interesting structure as the river entrance to the hospital; but the suggestion was over-ruled.

I must add I found the title somewhat complicated, may being the claimants thereto. It surely should be removed to the river, but not put aside and neglected like the noble colonnade of Burlington House, now going to wreck and ruin at Battersea.

P. H. B.

## AN INVASION BY ANTS DEFEATED.

SIR,—I do not know whether I can lay claim to the £1,000 reward offered by the gentleman in Eaton-square to rid him of his troublesome guests, but I will impart gratuitously my own experiences and success.

I have in my garden a long range of green-houses which were a year or two since invaded by ants, which swarmed in every direction, and in many places almost covered the plants. I never could discover that they did much harm, but still they were a nuisance, and some feeble efforts were made to get rid of them, but without success. About twelve months since a new gardener came into my employ, who adopted a different method. He distributed about the houses a number of common flat dinner-plates on which he poured a thin film of beer sweetened with sugar. This seemed to have a peculiar attraction for the ants. The discovery was to them like "striking ile." They descended upon it in myriads, when suddenly they were treated to a deluge of boiling water, which brought their luxurious enjoyment to a sudden end. This was continued for some time. Millions were destroyed, but to cursory observation the apparent numbers were little diminished, when suddenly in a single night the whole colony decamped, and since then, now many months ago, not a single ant has been seen on the premises.

The circumstance was so curious that I communicated the particulars to Sir John Lubbock, who writes me that he has never met with a similar case.

I have a theory on the subject which may appear somewhat fanciful, but I submit it for consideration. Ants, all will admit, display a certain amount of intelligence, limited, of course, by circumstances. The sweetened liquid with

which they were treated would appear to them a perfect God-send, to be eagerly availed of like some new "diggins" in California or Australia. The overwhelming deluge of boiling water, carrying wholesale destruction along with it, would appear, like an eruption of Vesuvius or Etna to us "humans," an utterly unaccountable catastrophe, for their limited vision and perception altogether conceal the existence, not to say the action, of human beings. Under these circumstances they seem to have felt that their only safety was in flight, which must have been concerted and thoroughly carried out, since no stragglers were left.

If your correspondents feel disposed to adopt my plan, I heartily wish them the same success.

J. A. P.

## EPIDEMIC OF ANTS.

SIR,—Your correspondent "H. S.," of January the 14th, asks, "What can be done to get rid of these pests?" In reply, I beg to state that I do not think he will find a better remedy for this terrible nuisance than the application of common naphtha (such as is burnt in street lamps for costermongers' stalls), which should be applied with a brush to every surface and in every crevice where they make their appearance. I might also add that it is equally applicable in the case of bugs.

WM. MIDDLEWICK, Sanitary Inspector.

## SKILLED LABOUR.

SIR,—Kindly allow me space to make a few remarks on this subject. My theory with regard to the very evident backward movement in the matter of practical ability made by the artisan classes during the past few years is, that the cause is not that put forward by "A Clerk of Works" in your recent number, viz., Jack-of-all-tradism.

I think I shall be able to satisfy most thinking men, who have not already satisfied themselves, that trade-unionism is, more than anything else, responsible for the negligent and unskilful manner in which mechanics carry out the work entrusted to them. It is a well-known fact that men are admitted into the unions without reference to their abilities. And it is just as well known that it would not do for a well-trained mechanic, however skilful he may be, to object to work side by side with a newly-fledged unionist, though they each receive the same wages for work that will not compare either in quantity or quality.

What, I ask, are the inducements for a man, in any trade, to try to master the difficulties and intricacies which abound in most trades, when he knows that, however capable he may ultimately become, he must be classed with men who have taken little trouble to make themselves proficient, and whose only passport is that they are unionists?

I do not dispute the fact that trade-unions might be so conducted as to make them of the greatest possible assistance to their respective trades and to the country at large; but I do repeat that I consider them, as at present constituted, answerable for nearly all the imperfect work so much deprecated, and for the retrogressive movement so palpable in the present generation of artisans.

COMMON SENSE.

## SLATE REFUSE.

SIR,—The letter of "J. W.," in your impression of the 21st ult., has come under the notice of the Directors of the New Vronheulog Slate Company (Limited), who are the sole licensees and manufacturers of the patent cement in blocks made from slate *refracts*, &c., and known as Sachs' Patent Metallic Vulcan Cement, and I shall be pleased to show your correspondent samples of the same here, or they can be seen at the Company's London Agents, Messrs. Roberts, Adlard, & Co., No. 18, Little Tower-street, E.C., together with the various specimens of its uses as made from the patent material.

W. BATTYE.

**Medina Cement.**—Messrs. Charles Francis, Son, & Co., are manufacturing an improved Roman or Medina cement. It sets, if gauged with hot water, in a minute and a half, and if gauged with cold water, in about ten minutes, which gives it value in tidal works. A coating a 4 in. thick, they assert, will effectually protect Portland cement concrete from the rise of the tide, and give it ample time to set, undisturbed by wash.

## THE MIDDLESBROUGH

## MUNICIPAL BUILDINGS COMPETITION.

SIR,—Hereswith I send you a paper containing an account of how the Council of Middlesbrough intend to manage the above competition. When I heard the Corporation were thinking of a competition, I saw several members, one or two being on the building committee, and urged that in the interest of competing architects and themselves they should adopt the system recommended by the Institute. They replied that the Corporation considered themselves fully qualified to act without professional assistance; and the enclosed article will show how they think proper to treat the profession, and dispose of the ratepayers' money. I write this in the hope that you will be able to use your influence to warn the profession against having anything to do with the matter; for, unless the "instructions" propose better terms than this article sketches out, the Corporation ought to receive a lesson by no response being made to their appeal.

ARCHITECT.

SIR,—Have you had your attention drawn to the conditions of the proposed competition for public buildings at Middlesbrough, which are such as to keep any architect, I should hope, from competing, and which are quite open to comment from your journal? There being 70,000, proposed to be expended, it is a pity a more satisfactory invitation be not given to the profession.

It is evidently the wish to get a complete working set of drawings (the scale asked for being 1/4 in. to 1 ft.) for little more than the premiums offered. A planer asked to be the first by each competitor for furnishing a complete specification, and no mention is made of employing the successful architect. On the contrary, the wording of the advertisement, the requiring drawings to a 1/4 in. scale, and the price for a specification, all point to the intention of not employing the architect who shall be considered entitled to the first premium.

There is no professional reference to be appointed, or other guarantees given of a fair and straightforward competition and treatment of the profession.

ARCHITECT.

## Miscellaneous.

**Sale of Sites for Artisans' Dwellings.**—At the Auction Mart, Tokenhouse-yard, on the 20th ult., Mr. Robert Reid offered for sale by auction, by order of the Metropolitan Board of Works, two freehold building sites for artisans' dwellings, both situated within a short distance of the Bishopsgate Station on the Great Eastern Railway. These sites were acquired by the Board under the powers conferred upon them by the Metropolitan Street Improvements Act, 1872, and under the 49th section of that Act the vendors are bound to sell or let the same for the erection thereon of suitable dwelling-houses or lodging-houses for mechanics, labourers, and other persons of the working and poorer classes. It was a further condition of the sale, however, that the purchasers would be at liberty to devote the basement and ground-floor of the buildings to be built by them to use as shops or workshops. The first lot comprised a plot of freehold building land, covering a superficial area of 18,500 square feet or thereabouts, situated on the south-west side of Great Eastern-street, Shoreditch, and having also a frontage to Hewitt-street, Curtain-road. The site was purchased by Messrs. Dunn & Soman, on behalf of the Improved Industrial Dwellings Company, for 2,500*l*. The second lot, comprising a plot containing 15,000 square feet, situated in Shackwell-street, Bethnal-green-road, having a frontage of 311 ft. in Shackwell-street and 105 ft. in Tyssen-street, was sold to Mr. Henry Fuskett for 2,020*l*.—*Metropolitan*.

**The Proposed New Mortuary for Chelsea.**—The application of the Vestry of Chelsea, and the rector and churchwardens, for a faculty to erect a new mortuary in the old burying-ground, in accordance with the plans prepared by the Vestry's Surveyor (Mr. G. H. Stayton, C.E.), was heard in the Wellington Memorial Chapel, in St. Paul's Cathedral, before Dr. Triestram, Q.C., Chancellor of the Diocese of London. The Chancellor granted the faculty, subject to the same being lodged in the Consistory Court for fourteen days, in order that any objections may be made by those interested in the matter.

**A Gift.**—Lady Charlotte Howard has given 5,000*l*. for the restoration of Whiston Church, an ancient edifice of which her brother, the late Hon. and Rev. Canon Howard, was rector for twenty years. The estimated cost is 7,000*l*, but the work has been divided into two sections; the first, amounting to close on 5,000*l*, dealing with the interior of the church.



**A Model Slaughter-house.**—A preliminary public meeting was held on Saturday, in the rooms of the Royal Society for the Prevention of Cruelty to Animals, 105, Jermyn-street, Piccadilly, to consider the subject of the reform of the methods of killing animals required for food. Dr. B. W. Richardson (in the chair) said what was now proposed was that a model slaughter-house should be established, so that the society might be in a position to go to Government and say, "This is the plan we wish to see adopted." Enumerating then the principal provisions desirable in an *abattoir*, he said it must be thoroughly lighted, and there must be no dark corners; drainage must be properly provided for, and there must be means of promptly removing offal; there must be an abundant and easily accessible supply of pure water for cleansing the carcasses, and convenient lavatories for the men; well-constructed and clean sheds, in which the animals could be kept apart, according to their kind, and away from the slaughter-room; and, lastly, a preserving-room, where, either by refrigeration or the use of antiseptics, meat might be safely stored in hot weather. The killing should only go on during stated hours, and by daylight. Finally, adopting the system which had been followed by the Jewish people, with so much benefit to themselves, there should be careful inspection, and, he should prefer, by skilled inspectors, of every carcass, in order to prevent any diseased meat leaving the slaughter-house. He believed that for a sum of between 1,000*l.* and 2,000*l.* a model slaughter-house might be provided, which would fulfil these requirements, and several London butchers were ready to give such an *abattoir* a trial.

**Fall of Church Tower.**—Hempstead, near Saffron Walden, in Essex, has possessed a fine old church with a lofty western tower, strengthened by buttresses. For some time it has been noticed that the tower has been giving way, and the strain on the south wall had become so great that on Saturday afternoon last it was determined that the bells should no longer be chimed nor the clock wound up. At a little after seven the same evening the south wall began to crumble away a few feet above the ground, and in less than an hour the greater part of the fine old tower slipped down, bringing with it about half the roof, and one arch of the south wall of the nave, and letting down also a good part of the roof of the south aisle.

**Fires.**—On the 24th of January, Stonehouse, Plymouth, was the scene of a very destructive fire which broke out about mid-day in the West of England Steam Joining and Moulding Mills, owned by Mr. G. E. Fox. A high wind was blowing, and at one time it was feared that the whole street in which the mills were situated would be destroyed. The estimated damage is between 10,000*l.* and 12,000*l.*—The premises of Messrs. Mackenzie & Moncur, horticultural builders and hot-water engineers, Upper Grove-place, Edinburgh, were on the night of the 26th of January destroyed by fire. The loss is estimated at nearly 10,000*l.*, and about 150 men have been temporarily thrown out of employment.

**Locks and Door Furniture.**—Mr. James Hill, of Upper Thames-street, has just issued, in a trade-book, a number of illustrations of his specialties in the way of locks, door furniture, and window-fastenings and fittings. The book will be found very useful. Some of the objects illustrated have been favourably commented upon by us as they were introduced, and have been largely used at home and abroad by the War and Admiralty departments, and by other public bodies.

**Fordingbridge.**—At a meeting of the guardians of the Fordingbridge Union, held on the 19th day of January, Mr. Fred. Bath, of Crown-chambers, Salisbury, was unanimously appointed architect for the new workhouse, about to be erected.

**Broadstairs.**—Mr. J. Clark, chairman of the Broadstairs Local Board, has commenced the erection of a new promenade pier and landing-stage at Broadstairs, at his own cost. The pier starts from Louisa Gapway, on the opposite side of the harbour to the present pier, and will extend 1200 ft. seaward, having an octagonal head and pavilion like Margate jetty. The cost of the pier will be about 20,000*l.*

**Memorial Eagle.**—A brass eagle lectern, with oak and granite base, has just been completed for the Worcester County Asylum at Powick, in memory of the late Dr. Sherlock, for twenty-seven years medical officer of the institution. The work was executed by Messrs. Jones & Willis.

**Fall of a Railway Bridge.**—An accident of an alarming character occurred a few days ago on the Midland Railway between Manchester and Stockport. As the 6.40 train from the Central Station, Manchester, was approaching Chorlton-cum-Hardy, the passengers were startled by feeling the carriages jolt violently. The train was pulled up, and, on the line being examined, it was found that a bridge crossing the railway had partially fallen down. One of the iron girders of which the bridge was composed had snapped in the middle, the two parts lying in a slanting direction across the metals. A considerable quantity of brick-work had also fallen. The bridge was only two or three years old, having been built when the line was constructed.

**New Roman Catholic Elementary Schools, Great Yarmouth.**—These schools, which provide accommodation for nearly 500 children, have just been completed and opened. There are two departments, a mixed school, with two class-rooms, and an infant school, with one class-room. Spacious lobbies and suitable offices, yards, &c., are also provided. The walling material is of red brick, moulded and ornamented brickwork being introduced for dressings, cornices, panels, &c. The building is Gothic in character, and is planned so as to allow of further extension. The total cost, including purchase of site, is about 4,000*l.* The works have been carried out from the designs and under the superintendence of Messrs. Bottle & Olley, architects, Great Yarmouth.

**A New Work, by Mr. Richard Meade,** Assistant Keeper of the Mining Records, entitled "The Coal and Iron Industries of the United Kingdom," will be issued about the 15th inst., by Messrs. Crosby Lockwood & Co. Besides a description of the coalfields and the principal seams of coal, Mr. Meade's book will include an account of the occurrence of iron ores in veins and seams, and a history of the rise and progress of pig-iron manufacture since the year 1740. Maps illustrating the position of coalfields and ironstone deposits throughout the kingdom will accompany the work.

**Leicester-square Soup Kitchen and Refuge.**—We understand that the premises of this institution are very old; dry-rot and other defects render rebuilding absolutely necessary. A palace is not required, but simply a plain, sound building. More commodious premises will greatly facilitate the work of relieving such numbers as this institution does. We hope the necessary funds will be forthcoming.

**Royal Scottish Academy.**—At a meeting of the Royal Scottish Academy, held in Edinburgh, Mr. William Fettes Douglas, R.S.A., was elected President of the Academy in the room of the late Sir Daniel Macones. In 1851, Mr. Douglas was elected an Associate, and in 1854 became an Academician. He is curator of the National Gallery, Edinburgh.

**Maldstone.**—A new tower has been erected to St. Faith's, Maldstone, from the designs of Mr. E. W. Stephens, architect. Mr. Edmund Vaughan, of Maldstone, was the contractor, and the material used was Kentish rag-stone, with Bath-stone dressings, from the Westwood Quarries of Messrs. Randell, Saunders, & Co., Limited.

**Bursting of a Reservoir.**—A reservoir in Calais, containing upwards of 110,000 gallons, burst at five o'clock in the evening of the 30th ult. The flood of water completely submerged and destroyed three houses, one of which was a school. Twenty-seven bodies have already been recovered. Are reservoirs in England under proper periodic inspection?

**St. Paul's Institute, Burton-on-Trent.**—The large clock in the tower of this building shows time on four 6-ft. dials, strikes the hours on a 19-owl bell, and chimes the Cambridge quarters upon four others. The whole of the work was carried out by Messrs. Smith, Midland Clock Works, Derby.

**St. Andrew's, Wells-street.**—One of the last works of the late Mr. G. E. Street was a groined ceiling and oak screens to form the baptistery at St. Andrew's, Wells-street, Oxford-street. The work was executed by Mr. Thomas Gregory, Station Works, Clapham Junction.

**Design submitted for Oldham Museum.** We are informed that Mr. H. Shaw's name should have been placed first, as architect, under the designs we published.

**Rowland Hill's Chapel, in Blackfriars-road,** is scheduled by the Waterloo and City Railway Company.

## TENDERS

For alterations and additions to St. Barnabas Vicarage, Addison-road, Kensington. Mr. Arthur Baker, architect. Quantities supplied by Mr. H. P. Foster:—  
Dove Bros. .... £2,375 0 0  
Nash ..... 2,200 0 0  
Patman & Fotheringham ..... 2,173 0 0  
Lucas & Son, Kensington ..... 2,103 0 0  
Adamson, Putney ..... 2,030 0 0  
Wall, Chiswick ..... 1,983 0 0  
Massey & Sons ..... 1,940 0 0  
Stimpson & Co., Brompton ..... 1,920 0 0  
W. Johnson, Wandsworth-common ..... 1,890 0 0

For building stables in Clarendon-grove, South Kensington, for Mr. W. Follett. Mr. George Edwards, architect. Quantities by Mr. Henry Lovegrove:—  
Martin, Wells, & Co. .... £2,184 0 0  
Goad ..... 2,111 0 0  
Niblett ..... 1,907 0 0  
Crake ..... 1,863 0 0  
Lucas & Son ..... 1,871 0 0  
Hickinbotham ..... 1,780 0 0  
Scrivener & Co. .... 1,727 0 0  
Stimpson & Co. (accepted) ..... 1,673 0 0  
Green (accepted) ..... 1,601 0 0

For alterations to the "Swiss Cottage," St. John's-wood, for Mr. A. Sauvageur. Mr. George Edwards, architect. Quantities by Mr. H. Lovegrove:—  
Martin, Wells, & Co. .... £574 0 0  
Green ..... 500 0 0  
Crake ..... 480 0 0  
Lenney ..... 468 0 0  
Barker & Cross ..... 433 0 0  
Williams ..... 433 0 0  
Sanders ..... 424 0 0  
Hickinbotham ..... 415 0 0  
Steed Bros. .... 4 5 0  
Stimpson & Co. (accepted) ..... 397 0 0  
Johnson (too late) ..... 360 0 0

For the erection of florist's shops and premises, Finchley-road, for Mr. Wm. Cole. Mr. Walter Graves, architect. Quantities by Mr. Pollard:—  
W. H. Lancelles ..... £297 0 0  
A. Scott ..... 867 0 0  
J. & H. Mills ..... 875 0 0  
B. E. Nightingale ..... 832 0 0  
Stimpson & Co. .... 813 0 0  
Ward & Lambie ..... 799 0 0  
Thomas & Butland ..... 708 0 0  
Conservatory Work.  
Dennis & Co. .... 193 0 0  
Weeks & Co. .... 125 0 0  
W. H. Lancelles ..... 106 0 0

For iron enclosure railing and gateways to general gardens, Nevern-square, Earl's-court, for Mr. Robert Whitaker. Mr. Walter Graves, architect:—  
R. B. & J. Pearson ..... £283 0 0  
Meredith & Co. .... 875 0 0  
Wells & Co. (accepted) ..... 525 0 0

For the erection of a block of school buildings, to be known as Colegrave-road Schools, at Stratford New Town, in the parish of West Ham, Essex, for the West Ham School Board, Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis & Son:—

Chas. Reed ..... £3,549 0 0  
J. Simpson ..... 7,989 10 0  
C. P. Mills ..... 7,850 0 0  
C. Cross ..... 7,843 0 0  
Hearle & Son ..... 7,583 0 0  
Chas. Cox ..... 7,368 0 0  
J. Tierman ..... 7,300 0 0  
W. H. Wisdeler ..... 7,291 0 0  
S. Scott ..... 7,243 0 0  
J. Sharrman ..... 7,090 0 0  
Haynes ..... 6,950 0 0  
B. E. Nightingale ..... 6,947 0 0  
J. Angood ..... 6,940 0 0  
A. Reed ..... 6,850 0 0  
North Bros. .... 6,847 0 0  
A. J. Smith ..... 6,845 0 0  
W. Gregor ..... 6,743 0 0  
Jas. Morter ..... 6,683 0 0  
Mark Gentry ..... 6,653 0 0  
J. Garrod ..... 6,583 0 0  
Parker ..... 6,445 0 0

For sundry fittings at the Lambeth Workhouse. Mr. T. W. Aldwinckle, architect:—

Joinery Fittings.  
Smith ..... £1,825 0 0  
Sheppard ..... 1,645 0 0  
Mills (accepted) ..... 1,573 0 0  
Fire-extinguishing Apparatus.  
Merryweather ..... 281 0 0  
Shand, Mason, & Co. (accepted) ..... 243 0 0  
Hot Water Fittings.  
Penham ..... 629 0 0  
Berry (accepted) ..... 609 0 0  
Gas Fittings.  
Berry ..... 585 0 0  
Strods ..... 549 0 0  
Biggs (accepted) ..... 466 0 0  
Kitchen Apparatus.  
Bonham (accepted) ..... 235 0 0

For erecting two shops at Salsdon-road, South Croydon for Mr. H. Spier. Mr. Frederick West, architect:—  
Page, Croydon ..... £1,507 0 0  
Horrocks, Croydon ..... 850 0 0  
M. Taylor, Croydon ..... 839 0 0

For the erection of office, warehouse, and boiler-house, at Vicarage-road, Waddon, for Mr. W. P. Wenham. Mr. Charles Hunt, architect:—  
M. Taylor, Croydon, accepted.

For the erection of two detached villa residences in the Blakeney-road, Beckenham, for Dr. Walker. Mr. Fredk. West, architect:—  
M. Taylor, Croydon (accepted) ..... £3,410 0 0

For Sussex House School, Woodlands Estate, Streatham for Mr. Fredk. H. Gray. Mr. Fredk. Wheeler, architect. Quantities by Messrs. Evans & Deacon:—  
Hill Bros. (accepted) ..... £3,970 0 0



For constructing 900 yards of 6 ft. by 3 ft. 4 in. brick sewer, for the Tottenham Local Board. Mr. W. H. De Pape, engineer:—

Walker & Co.	£5,000 0 0
E. Lawless	5,500 0 0
Wilkinson Bros.	4,100 0 0
Batterell	3,070 0 0
W. T. Brown	3,450 0 0
J. J. Noble & Co.	3,800 0 0
McKenzie, Williams, & Co.	3,880 0 0
Wm. Crockett	3,780 0 0
John Bell	3,550 0 0
Dickson	3,500 0 0
M. W. Rowley	3,370 0 0
Bottoms Bros.	3,350 0 0
J. W. Neave	3,345 0 0
J. W. Simpson	3,297 0 0
Humphreys & Son, Tottenham	3,220 0 0
J. Bloomfield	3,210 0 0
C. Lyons	3,200 0 0
K. Wright	3,160 0 0
A. T. Catley	3,080 0 0
Hill Bros.	3,000 0 0
J. Wyll	2,945 0 0
Ford & Everitt	2,940 0 0
Acock & Co.	2,920 0 0
Marshall	2,900 0 0

For rebuilding three houses in Bonner-lane, for Mr. Warren. Messrs. Borer & Gathercole, architects. Quantities by Mr. H. Lovegrove:—

W. W. Arbery, accepted.	
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For re-building four houses in Fuller-street, Bethnal-green, for Mr. English. Messrs. Borer & Gathercole, architects:—

Steel Bros., accepted.	
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For new parsonage-house and offices, Thorabrough, Bucks. Mr. F. H. Barfield, architect:—

T. Hooton, Buckingham (accepted)	£274 10 0
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For a pair of semi-detached houses, Faringdon, Berks, or Miss L. Plumb. Mr. F. H. Barfield, architect:—

W. J. Wheeler, Faringdon	£485 0 0
Cadell & Son, Faringdon	479 0 0
Jos. Sheppard, Faringdon (accepted)	478 5 0

For making alterations to the Hare and Hounds public house, Feltham-hill, Sunbury, for William Gomm. Mr. Edward Monson, jun., architect:—

Joseph Dorey, Old Brentford	£230 0 0
Thomas Braden, N.W. Brentford	349 0 0
Geo. Gibson, Southall	347 0 0
Thomas Nye, Basing (accepted)	310 0 0

For making alterations to No. 1, Merthyr-terrace, Fisher-lane, Chiswick, for Mr. Owen Davies. Mr. Edward Monson, jun., architect:—

G. Lyford, Hammer-smith (accepted)	£330 0 0
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For the erection of a detached house, Holwood-road, Bromley, Kent, for Mr. J. Walker. Mr. Percy Monckton, architect. Quantities supplied:—

Arnaud	£1,430 0 0
Jarrett	1,472 0 0
Crovelly	1,388 0 0
Taylor & Son	1,330 0 0
Grubb	1,375 0 0
Osborn	1,165 0 0

For repairs and additions to Methodist Chapel, North Bow. Mr. M. J. Pocock, architect:—

Good	£113 0 0
Shingfield	307 0 0
Stoung	379 0 0
Harris & Wardrop	366 0 0
Sharpe	395 0 0

For paving and making-up Walton-street, Stapleton-road, Bristol, for St. George's Sanitary Authority. Mr. William Dawson, surveyor:—

Martin & Noddy	£240 10 5
Ribb & Hickory	233 7 11
Norman & Parker	232 10 10
Galbraith	229 10 0
Lovell	229 0 10

For re-building the Norman Arms public house, Crown-road, Fulham, for Mr. John Bowden. Mr. F. Nesbitt Kemp, architect:—

A. Thorn	£1,650 0 0
N. Allen & Sons	1,570 0 0
J. H. Brase	1,206 0 0
Hy. Smith	1,245 0 0
Walter Field (accepted)	1,010 0 0

For the erection of St. Matthias's vicarage, Bethnal-green. Mr. William White, architect. Quantities by Mr. Edward Crutcheon:—

Patman & Fotheringham	£2,457 0 0
Dora Bros.	2,340 0 0
Outhwaite & Son	2,333 0 0
Ashey Bros.	2,249 0 0
Hobson	2,233 0 0
Gregory (accepted)	2,230 0 0

For erecting a residence at Leatherhead, for Mr. F. Williams. Mr. O. Jenkin Jones, architect:—

James Holloway, Wandsworth-road (accepted)	£2,050 0 0
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For Wellington-street school, for the Portsmouth School Board. Mr. George Rake, architect:—

Bolton	£6,720 0 0
Farmer	6,420 0 0
White	5,400 0 0
Barwick	5,284 4 0
Page	5,274 14 8
Ward	5,268 0 0
Barbidge	5,249 0 0
Stephens & Bastow	5,211 0 0
Cooper	5,069 0 0
Light Bros.	5,000 0 0
Hayter	4,915 0 0
Quick	4,818 0 0
Crook	4,727 0 0
Longley	4,720 0 0
Evans Bros.	4,701 0 0
Lewis (accepted)	4,434 0 0

For the erection of shop, Finchley-road, for Mr. Richard Ross. Mr. Walter Graves, architect. Quantities by Mr. Pollard:—

King & Son	£230 0 0
W. H. Lancelles	287 0 0
J. & H. Mills	290 0 0
Thomas & Sutland	247 0 0
Simpson & Co.	244 0 0
Nightingale & Co.	241 0 0
Ward & Lumbo	228 0 0

White Horse. Percy's green, gas-fittings:—For "W. Nunn," read W. Nunn.

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# The Builder.

VOL. XLII. No. 2024.

SATURDAY, FEBRUARY 11, 1882.

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### Magna Græcia.

It would seem almost incredible, indeed the statement would scarcely be believed were it not supported by learned authority, that there should be known to exist in Italy a second and even more interesting "Pompeii." The excavations that were pursued in the cities at the foot of Vesuvius on their discovery in the last century soon revealed to the archaeological world the fact that Pompeii was but a city of secondary, or even third rate, importance; but we have now a promise held out of seeing unearthed, after a slumber of twenty-three centuries, another famous city of antiquity.

A competent French archaeologist, M. Lenormant, has announced that we have it in our power to bring to light at any moment in Southern Italy, in Magna Græcia, a Greek colony of the eighth century before Christ, no other than the city of Sybaris, the home of those luxurious voluptuaries the Sybarites, of whom the few know so much and the many even are not altogether ignorant. The conditions under which the city perished in the sixth century before the Christian era were as striking,—though differing in cause,—as were those by which the cities at the foot of Vesuvius were destroyed; washed away by the river Crathis, along which the city extended over six miles, Sybaris now lies buried under fathoms of mud. The results of the excavation of the plain at the mouth of the river would reveal to us (we have the assurance of M. Lenormant, in the work he has recently published on Magna Græcia) another and even more interesting Pompeii, one of the wealthiest cities of antiquity belonging to a period stretching from the eighth to the sixth century B.C.

"A whole civilisation," writes M. Lenormant, "still imperfectly known, will be evoked from these ruins by a resurrection which will show us antiquity at the very point at which it had attained its highest degree of development, and that, too, without the smallest admixture of later ages; we shall see the picture of Greek culture at a moment when it assumes a special interest." Architecturally, also, the researches would be most important. "Let us remember that the temples of Paestum are among the most justly admired types of Greek architecture, but, what is most curious, these temples belong alone to a secondary city, a colony of Sybaris, and the

finest of all were erected at a time when Posidonia received its artists from the mother-city. What must be the works of the metropolis? There are certainly, under the mud of Sybaris, temples as gigantic as those of Selinonte, which lie overthrown, but without a single stone having ever been removed." Supported by such authority, here is a promise which, even with the recent discoveries of Di Cesnola and Schliemann fresh in our memories, is calculated to interest to the highest pitch a large section of the archaeological and artistic world. What might not come to reward the excavators in this untouched classic mine so strangely preserved? The difficulties accompanying the excavations have so far, it is to be presumed, deterred any action being taken. Steam power and large funds would be requisite to raise from its mud the buried Sybaris.

At this gloomy season of the year, when the worst efforts of our island climate are united in our great towns with the unabated endeavours of thousands of householders to aid King Fog, there are not a few who, some obligatorily, some advisedly, leave home for the sunny South. Southern Europe is already invaded by these privileged exiles, crowding from Russia, from Scandinavia, from France, from America, and from England; but it is in the familiar spots they each and all congregate. It is along the now villa-thronged Riviera, it is in picturesque Algiers, it is in artistic Florence and social Rome, and where not? How many strike out in new directions? Though Italy has been for centuries a favourite winter residence, indeed, a perpetual home for wanderers from all nations, there are portions of the peninsula which are still practically unvisited by the traveller. It is not its remoteness, it is its evil reputation that has probably prevented the southern extremity of Italy from becoming better known. The legends of the brigands who haunt the fastnesses of the district of Calabria,—which has obligingly supplied the artists with those picturesque models so incorrectly known as Roman peasants,—have perhaps affected, from time to time, too dramatic a reality for even the most romantically-disposed to venture into a country to which the best guide-books devote but a few pages. But ours is the age of illusions dispelled; travellers' tales are in these days discredited or exposed. The brigand-haunted Calabria has been recently invaded by a party, consisting of a gentleman, his wife, and daughter, who have returned to tell us their adventures.

The name of M. Lenormant, the distinguished French archaeologist, is familiar to English readers, if only through the pages of one of our artistic contemporaries, to which he has often contributed his interesting communications. M. Lenormant visited, not long since, as we have stated, with his wife and daughter, the southern extremity of Italy, classically known as Magna Græcia, and the result of this tour we have in two volumes, which supply a great deal of

previously unknown information of a portion of Italy too long unjustly overlooked ("La Grande Grèce: Paysages et Histoire.") The qualifications of the writer for his task, it may be briefly premised, are not alone those which belong to the archaeologist; with that delightful power which French savants possess, in common with our scientific writers, of rendering even the driest of subjects attractive, these volumes will be found to deal not alone with the past, but to describe an amply sufficient number of little travelling incidents to render the work attractive to the general reader.

The school-boy, who since Macanlay's almost trite reference to his supposed stock of information has been taken as the average judge in most matters historical, will readily tell any one who asks him how it came about that the southern portion of Italy is known classically as Magna Græcia, formed of a number of colonies from the mother country of Greece. The history of the southern toe and instep of the Italian boot is but a chapter of the story of the great Greek people; but of the existence of these colonies it requires the archaeologists to tell us; ravaged by Greeks, by Carthaginians, Romans, Vandals, Lombards, Normans, Saracens, Germans, Spaniards, and French, the lover of antiquity will be sorely disappointed should he expect to find any standing relics of the once-famed cities of Magna Græcia. But here, separated from home but by a narrow strip of sea, in a climate almost exactly resembling their own, the Greek emigrants, eight centuries before the Christian era, settled and prospered, their first great work consisting in rendering healthy and fertile, by a system of drainage, the marshy alluvial plains on the sea-board; and the land thus rendered productive, there soon sprang up the great cities of Magna Græcia, of which the Classic writers have spoken in such terms of admiration.

Centuries pass away, Magna Græcia is conquered by the Romans and Romanised; more generations, and the country is in possession of the armies of the Lower Empire; Southern Italy is again thoroughly Greek in spirit and in language.\* In this fact an interesting problem presents itself. How comes it that so powerful an influence should have been worked, and at a distance, by a Government which, like that of Byzantium, at all times has been painted as of the extremest debility? It would seem that the weakness of the Lower Empire has been exaggerated, under the double influence of Roman Catholic prejudice, always opposed to the separated Greek Church, and the philosophic prejudices of the last century, unwilling to picture a Christian empire ruled almost exclusively by ecclesiastics. We owe it to the recent researches of ardent Hellenists that this view has been proved to be incorrect;

\* Not the language of Plato and Herodotus, but a language much resembling modern Romanic.



the Greeks of the Middle Ages, so sadly vilified, we must thank for having served during nine centuries as a bulwark against the Slavs and the Mussulmans, and, nevertheless, be forgotten, that Constantinople in the twilight of the Middle Ages served as the centre of arts and refinement, influencing by its artists and its students our still befogged West. It is not, therefore, very astonishing that in the ninth century this empire should have had the power to conquer, not alone by its arms but by its civilisation, the south of Italy, where still lingered so many memories of the common mother-country. Now, however, the traces of this earlier civilisation barely remain. M. Lenormant, armed with an intimate literary and archaeological acquaintance with his subject, has sought out these traces, but hopelessly; the search suggests, however, many romantic comparisons, supported by poetic quotations.

To the past of this once fertile district is attached the warmest interest; of its future there are not wanting many hints; the land possesses essentially "capabilities," but the energy which enlivened the marshes during the Greek days must again be shown. With the turbulent Middle Ages the inhabitants fled to the mountains, neglecting the fertile plain, over which soon spread again the dreaded malaria;\* this once more must be driven out, and plenty and prosperity may smile again over a land once wealthy, and famed for its commercial industry, its refinement, its literature, and its art.

#### IMPORTANT RESULTS OF EXPERIMENTS IN CEMENT AND IN MORTAR.

An instructive discussion, the report of which, together with that of the communications on which it was based, fills 180 pages of the sixty-second volume of the Minutes of Proceedings, took place on the 11th of May, 1880, at the Institution of Civil Engineers. The subject was the manufacture, mode of testing, and qualities of Portland cement. Major-General Scott, R.E., Mr. Bernays, and Mr. J. Grant contributed papers; and the subject was illustrated in great detail and with admirable patience.

Among those gentlemen who brought both practical and theoretical knowledge to bear on the subjects discussed was Mr. H. Faija, some of whose remarks on the subject of the determination of the specific gravity of cement were novel and important. Mr. Faija was, at the time, on the point of commencing a series of experiments, having for their object to determine the behaviour of cement when gauged with sea water, and afterwards placed in sea water. The results of these experiments he has, within the last few days, communicated to the Institution.

For the details of the experiments and the tabular form in which the results are displayed, we cannot be expected to find room, and must refer our readers to the next volume of the Minutes of Proceedings, when published. But the general outcome is of too much importance to be passed over in silence. It is to the effect that although the use of sea-water for gauging seems to retard the setting or hardening of cement, it eventually gives it greater strength than it attains when gauged with fresh water. This is on the condition of the compared samples being exposed permanently to the air. The reverse appears to be the case with regard to cement which is intended to set and harden under water. In that case samples gauged with fresh water show a decided superiority in strength compared to samples gauged with sea-water. It is thence deduced that the salts contained in sea-water have a damaging effect on cement gauged with sea-water, and afterwards immersed in water, whether salt or fresh. On the contrary, they have a beneficial effect, if introduced into the cement by the means of gauging with sea-water, if the cement be allowed to dry and harden in the air.

The practical conclusion is brief and plain. For all marine structures, those portions of the work which are below high-water level should be set in cement gauged with fresh water, while all portions of the work which are above

high-water mark should be built with cement gauged with sea-water.

We take the occasion of a case in which the results of the inquiries set on foot by the Institution of Civil Engineers are of so much practical value to the architect, to make the suggestion that even more important results may be expected to ensue if either the Institution of Civil Engineers or the Royal Institute of British Architects would invite contributions on the difference in the method of treating lime for building purposes pursued in England and in Italy. We have more than once referred to this subject. Familiar with both methods, we are able to speak practically both as to their diametric opposition, and also as to the greater excellence of the Italian mode, as now practised in Italy. Nor do we believe that the difference has any thing to do with the difference of lime. Between English mortar made from burnt chalk, and that made from the boulders cast up by the sea on the Welsh coast, and known as Aberthaw lime, there is as great a difference as can be found between almost any samples of English and of Italian lime. Again, when we look at the flat tile-shaped brickwork which, when found in England, asserts its Roman workmanship, or even at the tenaciousness of the unroofed walls of some of the ancient priories or chantries disestablished by Henry VIII., and contrast the petrified durability of the Pagan or monkish plaster with the condition to which that in a newly-built and unhabited house so notoriously soon returns, we have, at all events, a strong inducement for investigation of the two methods. The modern English plan, we suppose almost universally adopted, certainly insisted on with great force in many important specifications, is to use the lime hot from the slaking. Lime slaked and not used within the day is ordered to be removed from the works as rubbish. But the Italian builder would resort to the epithet on the freshly-slaked lime; and long attention to building in Italy leads the present writer to the conclusion that the Italian method is the true one. Our inability to obtain true fresco work in England is due, in our opinion, neither to climate nor to the chemical character of the lime, but to hasty use after slaking. In Italy the first proceeding of the builder is to dig a pit for the lime to be used in the building; it is thrown in and covered with water, and if so prepared for a couple of years before it is used, so much the better—at least in the opinion of the Italian architect.

Here is a matter of practice of the utmost importance, in which the practice of the master builders of the world,—our own masters,—is diametrically opposed to that now prevalent among us. More than that, the results of the Italian practice are vastly superior to those of our own. It is a matter that affects the stability and the dryness of every house to be built, from the cottage to the palace. Is it not, then, a subject on which it will well become the great consultative institutions connected with the building trades to set on foot adequate inquiries?

#### THE GERMAN PARLIAMENT HOUSE.

The Commission for superintending the erection of the House of the German Imperial Parliament or Reichstag has decided to open a new competition for the final plan for the new structure. Unfortunately, it appears from the official press that foreigners are hardly likely to be invited to enter in this contest. A semi-official notice in the organ of the Board of Works in Berlin intimates that all German architects will be eligible to compete, and even hints that the privilege will be likewise extended to the architects of the German-speaking provinces of Austria and the German Cantons of Switzerland. The official invitation to this competition has, however, not yet been published, and the question whether foreign architects are to be excluded will remain undecided until the terms of the competition are officially made known.

The above-mentioned Commission has drawn up a preliminary report and programme in reference to the details of the interior of the new House. The document contains some particulars of general interest. The site finally decided upon is described as a rectangle of 136 metres in length, by 95 metres in breadth. The niveau is practically level throughout. The Commission has determined that the border lines of the site must not, under any circumstances, be touched by flights of steps, outbuildings, entrance-halls, or the like.

A. The principal apartment which is to be provided in the new House is the Chamber of Session or Hall of Assembly. The area of this hall is to be from 600 to 640 square metres. The hall is to be accessible by doors conveniently placed, and is to be surrounded by a broad light corridor. All the entrances are to be protected from draughts. The deputies are to have entrances separate from those for the members of the Federal Council. Two of the deputies' entrances are to be for the purpose of divisions, and must be arranged so that the one stands opposite to the other. With regard to the interior arrangements of the Hall of Assembly most importance is attached:—1. To the production of good acoustic effects. Hence care is to be taken that the hall be not too high nor the curves or arches too deep. 2. In the next place, attention must be paid to the heating, ventilation, and lighting, so that the temperature of the hall may be equable.

The Hall of Assembly is to include the following features:—

1. The seats are to accommodate 400 deputies, and are to be arranged in amphitheatrical form. The gradient of the hall floor is to be 1 in 10. The seats are all to be supplied with backs, and with looking desks in front. They are to be easy of access, and for this purpose there are to be passages or gangways radiating from the centre (near the President's seat), and so arranged that there are not to be more than four deputies' seats in a line between each two neighbouring gangways. Each seat, with its corresponding desk, must not occupy a space of more than 1.10 metre in depth by 0.55 to 0.65 in width.

2. There is to be an elevated and spacious tribune for the accommodation of the President, and provided with a roomy seat on each side for the clerks of the house (*Schriefführer*). Each of these three seats is to be provided with a spacious desk. The same three seats are likewise to command a view of the whole of the hall.

3. The rostrum or tribune for deputies addressing the House is to be in front of the President's seat, and at a somewhat lower elevation. It is to be provided with a raised reading-desk and side-tables, as well as with two writing-desks and seats, one on each side, for the accommodation of the referents, or committee reporters.

4. There are to be writing-tables for six official stenographers in front of the orator's rostrum. A low barrier is to separate the stenographers' tables from the rest of the hall, and the stenographers' compartment is to be provided with a separate entrance with steps descending to their private room in a lower story, so as to obviate the necessity of their passing through the hall itself.

5. On each side of the President's tribune there are to be tables with twenty-four seats, for the accommodation of the members and commissioners of the Federal Council. It is of particular importance that the speakers in these seats should be thoroughly audible in all parts of the house.

6. There must be a table upon which official documents may be deposited.

7. There is to be a *loge* or box for the accommodation of the Imperial Court and the allied princes. It is to be provided with twelve *fauvels*, and is to have in its rear an adjoining saloon, ante-room, and lavatory. These apartments are all to be to the left (not in the rear) of the President's tribune, and are to be accessible by an entrance separate from all the other ways into the house.

8. There are to be one or two *loges* or boxes, with twenty-four *fauvels* in all, for the accommodation of the *corps diplomatique*, and provided with an adjoining ante-room and lavatory.

There are further to be provided:—

9. A *loge* or box, with about forty seats, to be placed at the disposal of the members of the Federal Council.

10. A *loge* with about eighty seats to be placed at the disposal of the deputies.

11. A *loge* with about thirty seats for members of the various German Legislatures.

12. A *loge* with about sixty seats to be placed at the disposal of the Administrative Boards.

13. Two reserved *loges* with thirty seats in each.

14. Several boxes with altogether about 150 seats for the accommodation of the public.

All the last six sets of *loges* (9 to 14) are to be provided with ante-rooms and wardrobes of sufficient size.

\* It is interesting to learn of legends still in existence relating allegorically the conquest of the *madrasa* under the figure of a horrible demon devouring the people of the district, but eventually destroyed, and only returning to ravage the country when the neglect of the Middle Ages had allowed the undrained marshes to render the plains pestilential.



15. *Loges* (or galleries) for the representatives of the press, with eighty seats in all, sixty of which are to be provided with looking desks.

All the *loges* enumerated from the 9th to the 15th are to be accessible by entrances, quite separate from all the others leading into the hall. All the *loges* must command a good view over the hall, and it is of importance that the speakers should be well heard, more particularly in the Journalists' Gallery (15th). It is left to the option of the architect to make some of the *loges* project beyond the walls into the House itself, but the extent of such projection must not exceed 1 metre. The entrances into the different *loges* are to be protected from draught; and extra ways out are to be provided for use in case of emergency.

B. The other apartments which are to be provided on the level of the floor of the Chamber of Session are:—

1. A large Conference Hall for Deputies, immediately contiguous to the Hall of Session, and with an area of not more than 500 square metres at the maximum. This hall is to be adapted for use on the occasion of any festivities or ceremonies, or for large committee meetings. Particular attention is to be paid to the decoration of this hall.

2. A writing-room (or library) for the President of the Imperial Parliament; and

3. A reception-room for the same official. Each of these two apartments is to be 40 square metres in area.

4. An ante-room of 20 square metres to the two preceding apartments.

5. Two rooms for the Clerks of the House, each of 40 square metres in area.

The rooms from No. 2 to No. 5 are to be placed near the Hall of Session, so as to be readily accessible from the President's tribune.

6. A writing-room (or library), for the Imperial Chancellor, of an area of 40 square metres.

7. An audience or reception room for the Chancellor, also of 40 square metres area.

8. An ante-room to the two preceding, of 20 square metres area.

9. Two official apartments for the heads of the Imperial Administrative Boards, each of 40 square metres area.

10. A Hall of Assembly for the Federal Council, not too distant from the Chamber of the House, and of 200 square metres area. This apartment is to have plenty of light from high windows on the sides, or from above. The hall is to be provided with a council-table, 1.25 metres in width, and with sixty *fauteuil* seats round it.

11. An ante-saloon to the preceding, of 80 to 100 square metres area.

12. Two committee-rooms for the Federal Council committees, to be near their Assembly-hall (12), and with an area of 80 and 40 square metres respectively.

13. A wardrobe for the Federal Council, 40 square metres.

The apartments here numbered from 6 to 15 must be approached by an entrance entirely independent of any other way into the House.

16. A refreshment saloon, with three adjoining apartments, covering altogether 400 square metres.

17. One or two reading-rooms for literature of the day: area, 250 square metres.

18. Two writing-saloons: area together, 150 square metres.

19. At least two well-lighted wardrobes for the accommodation of the 400 deputies.

The rooms numbered 16 to 19 must be situated so as to be in as convenient connexion as possible with the chief Hall of Assembly and the Conference Hall. (See A and B. 1.)

C. This division refers to the apartments which are to be referred to the various other floors of the building, according to their several purposes and requirements. They include,—

1. Six conversation or reception rooms, of different sizes, for the use of deputies; area together, 180 metres. These rooms are to be mostly as near as possible to the Session Chamber and large saloon, and as near as possible on the same level. They are also to be convenient of access to the public.

2. Four lavatories or toilet-rooms for deputies, each 20 square metres area.

3. Six committee-rooms for the sections and committees of the Imperial Parliament; each to seat sixty persons, and each of an area of 130 to 150 square metres.

4. Two larger committee-rooms for the sections, committees, &c., of the Imperial Parlia-

ment, each seating 150 persons, and each of 300 square metres area.

5. Eight committee-rooms, each for thirty persons, and each covering 80 square metres.

6. Several small reception-rooms, as close as possible to the above rooms (C 3, 4, and 5).

7. Rooms for the representatives of the press, with a total of eighty well-lighted writing-seats, to be arranged in at least eight rooms of a total area of 300 square metres. These rooms are to be placed so as to be as directly accessible as possible from the press lobby.

8. An ante-room for the accommodation of news-messengers; area 40 square metres.

9. An office for the director of the Bureau of the House, of 40 square metres area.

10. An ante-room to the same, 20 square metres.

11. A second ante-room to the same, for the use of the public, 30 square metres. The room C 9 must be accessible from and within a short distance of the President's tribune. Room C 11 must have a special entrance for the public.

12. Two saloons for the registrars, covering jointly 200 square metres.

13. A cashier's department, 40 square metres.

14. A clerks' room, with fifteen well-lighted writing places.

15. A reference-room, 20 square metres.

16. Two rooms for the expedition of printed matter, of 40 and 100 square metres respectively.

17. A room for the chief messenger, contiguous to the preceding, 60 square metres.

18. A room for sixty office servants and messengers of the Reichstag, 100 square metres.

19. A wardrobe for the preceding, 40 square metres.

20. A room for the office servants of the Federal Council, to be placed near the entrance to the Federal Council Chambers, 40 square metres.

21. A well-lighted room for the archives, specially secured against the dangers from without, as well as against fire, 200 square metres.

22. A room for the storage of old documents, 200 square metres.

23. The Library of the Imperial Parliament. The area is not to exceed 1,000 square metres; the exposed shelf surface is to cover at least 2,500 square metres.

24. Two offices for the Librarian and his assistants, of 60 and 40 square metres area respectively.

25. A reading-room for deputies, of 60 square metres.

26. A writing-room for the same, 40 square metres.

27. An attendants' room, near the Librarian's office, 30 square metres.

Rooms 23 and 24, and rooms 24, 25, and 26, must be connected with each other.

D. The rooms in the lower story are:—

1. Two apartments for the official stenographers, each with 15 well-lighted writing-places, each apartment being of 60 to 80 square metres area.

2. A room for the correction of stenographic reports, with three writing-places, and with reading-desks for the deputies, 60 square metres.

3. The following vestibules:—

a. A vestibule for the deputies with a covered principal entrance.

b. A carriage entrance and vestibule for the Imperial Court, the allied princes, and the *corps diplomatique*.

c. A carriage entrance and vestibule for the Federal Council. It is permitted to substitute a single carriage entrance and vestibule for the two mentioned under b and c.

d. A vestibule for the public. In arranging the vestibules care is to be taken that the entrances for the ordinary business of the House are not to be on the Königs Platz side.

4. A room for the post-office, 40 square metres.

5. A room for the telegraph service, 40 square metres.

6. A room for the telephone service, 40 square metres. These rooms, D 4, 5, and 6, must be near the vestibule D 3 a.

7. A ticket-office near the vestibule D 3 d.

8. Doorkeepers' rooms on the vestibules.

9. Apartments for the house inspector,—four rooms with apartments.

10. Three sets of doorkeepers' apartments, each of two rooms with apartments.

11. Two sets of stokers' or men-servants' apartments, each of two rooms with apartments.

E. In addition to the above, there are further to be provided:—

1. Kitchen for the refreshment contractor.

2. Room for a steam-engine, with boiler-house.

3. Coal and fuel house, to be near the heating apparatus and boiler-house.

4. Room for keeping utensils.

5. Some small workshops for the use of men working on the premises.

6. A small printing-office.

7. Guard-room for the accommodation of the police and firemen, 60 square metres.

The edifice is to be built fireproof throughout. The staircase for the Imperial Court, those for the Federal Council, those for the deputies, and finally, those for the use of the public, are to be kept entirely separate from each other. From without they are to be accessible by approaches as short and as well lighted as possible. There are also to be separate entrances for the officials, attendants, and kitchen servants. Water-closets, urinals, and lavatories, the latter in separate rooms, are to be provided in sufficient number on each floor and near each group of rooms, and are to be light and roomy.

Great importance is attached to all the rooms where business is to be transacted, and which will accordingly be occupied in the daytime,\* being so arranged that they can receive the daylight in as direct and convenient a manner as possible.

#### A GREAT PRE-HISTORIC "FIND."

IN the September of last year, it will be remembered by our readers, an International Congress of Geologists was held at Bologna; and the occasion was chosen by the municipality to re-open its *Museo Civico*. The new museum, though inaugurated so modestly, now ranks from the exceptionally rare nature of its contents, among the famous museums of the world. To the student of that most recent of the branches of antiquarian research known as prehistoric archaeology, the Bologna Municipal Museum is the richest in existing specimens of the art of the so-called "bronze age."

With even the conscientious traveller in Italy it has so far been the custom to "do" Bologna in a very short visit, with a homage paid to Raffaele's "Santa Cecilia," the sweet and simple works of the goldsmith painter, Francia of Bologna, and of that artist whose work so influenced the young Raffaello, Pergino, a glance at the square yards of canvas covered so deftly by the Caracci, Guido, and their prolific school; with a visit to the gaunt yet grandiose basilica of San Petronio, San Domenico and its shrine by Nicolo Pisano, the leaning Towers and the University. Now, however, the new museum offers a feature meriting somewhat more attention,—a museum, equal if not superior in interest to the famous Pompeian collection at Naples, carrying one back, as its contents do, to almost the very darkest hour of the buried past, to the life of a civilisation so distant that, a generation ago, its very existence was not even suspected by our archaeologists.

Bologna is situated, as a reference to the map will show, just at a passage-way of the northern Apennines; from the most distant times it must therefore have been the exchange and mart for the peoples of Northern Italy and those of the Tuscan cities. While the tribes of the Stone Age occupied the *terra-mares* of Emilia, and built round Modena and Reggio their little fortified hamlets in the midst of the marshes of the valley of the Po, the vanguard of the Aryan migration,—those Pelasgians armed with bronze weapons, traces of whom are met with on the shores of Asia Minor, in Greece, in Algeria, in Carthage, and in antique Etruria,—settled down in Central Italy, and founded that sturdy Tuscan race scarcely changed in the 3,000 years of its existence. Soon driven back to the west of the Apennines by the second branch of the people who had advanced up the valley of the Danube, the Umbrians, the Celts, and the Latins, it abandoned to them the eastern coast of Italy, the lower valley of the Tiber, and established at the ancient Felsina a sort of mart where the products of the South were exchanged for those of the North. On stirring the soil in the immediate neighbourhood of Bologna, at La Certosa, at Ranzano, &c., are found invaluable vestiges

\* The German Parliament always meets and transacts its business in the daytime. A night-sitting only occurs on rare and extreme emergencies.



of the Bronze age and of the first Iron age belonging to the Pelagic period. The whole district is, in fact, a huge pre-historic necropolis, the tombs of which yield every day the rarest relics of a civilisation as yet scarcely known. Swords and bronze poniards, hatchets, bracelets, fibula, and ornaments, vessels of blue Oriental glass, huge funerary urns, red and black terra-cottas with characteristic decoration (among which is included the handled cross,—*swastika*,—of the Vedic religion), harness and horses' bits in bronze, are found,—all the still recognisable products of the industry of two races absolutely distinct, and arrived at a very differing degree of skill in the metallurgic arts, at a very differing degree, that is to say, of civilisation; and Bologna offers specimens in profusion so great that the archaeologist remains, on a first visit to the museum, astounded at the sight of such marvels.

It was not long since that, in the excavations necessary for laying down a drain in the centre of the city, near the church of San Francisco, perhaps one of the largest "finds" of pre-historic bronzes ever made was unearthed. At a small distance below the surface, under a stratum of ashes and charcoal, the pick and shovel laid bare one of those immense urns in terra-cotta which were used in classic times as barrels. The urn broke on contact with the air, displaying inside an extraordinary collection of bronze objects, all carefully packed, so as to occupy the least possible amount of space, the heaviest and largest at the bottom and against the sides, the lightest at the top and in the centre,—a lesson in the art of packing which, several thousand years after, may be taken with profit. There were found literally several hundred hatchets, representing all the various Mediterranean and Danubian types,—sickles, chisels, saws, files, gouges, knives, razors, bracelets, *plagues* covered with embossed ornaments, more than 2,000 fibula, lance-heads, poniards, swords, and ingots of metal. Altogether there were 14,000 objects, the weight exceeding a ton and a half. The greater part were well worn, or purposely broken up. Some of the jewelry had been mended with iron rivets, that metal being then doubtless considered as precious. It was easy to recognise that either a foundry or the stock of a bronze-smith of the first Iron age had been unearthed. This large quantity of old bronze, belonging to preceding periods, had, without doubt, been gathered in the neighbourhood by some industrious metal-worker, who was perhaps on the point of re-smelting the whole, when, surprised by a war, by a siege, or by an invasion, he determined to bury the mass in his workshop, hiding the place with the ashes from his fireplace. The danger over, he intended to unbury his treasure; but the accidents of war, his death, or that of those to whom he may have confided the secret, prevented the discovery of the store, which was left to the present generation, as if by the design of Providence, to show us something of the otherwise undiscoverable existence of 3,000 years ago.

Up to the present date competent authorities agree in declaring that nothing comparable to this "find" of prehistoric antiquities has ever been made.\* The whole sixty-seven discoveries so far made in France and Switzerland have yielded little over 3,000 specimens. At Bologna we have a complete collection of the tools, implements, and ornaments of this distant period. A careful study of these relics will enable the archaeologist to reconstitute the whole industrial civilisation of the proto-Etruscan races, a branch of inquiry of a most novel and attractive nature.

The Museo Civico, in which all these treasures have been arranged in admirable order, though it has been long in existence, may now be said to take its place as one of the important museums of Europe. It is situated only a few steps from the cathedral of San Petronio, on the Piazza, which, from the spirited modern statue (even in our country not unknown) erected not long since to the memory of Galvani, bears the name of that great scientist, who heralded so many of the most extraordinary discoveries of the present century. The museum, in addition to its pre-historic treasures, possesses not a few other remarkable works scattered through its twenty-three rooms, four of which contain a collection of Egyptian antiquities, which, if falling far short of that in our national

institution in Great Russell-street, or that in the Louvre, numbers not a few works of exceptional interest, well known to all Egyptologists. It is beyond the limits of our space to speak of these at length; suffice it to say that the Bologna Municipal Museum possesses one of the only two *steles* known to exist on which is shown the horse domesticated by the Egyptians.

#### CANON BARRY AND THE ARCHITECTURAL MUSEUM.

THE annual public distribution of prizes and medals to the successful students connected with the Royal Architectural Museum and School of Art took place on Friday, the 3rd inst., at the Museum in Tufon-street, Westminster. The chair was taken by the Rev. Canon Barry, D.D. The following is the list of the prizeholders:—

##### Medals.

James Thomas, design for mosaic pavement,—silver medal.

Walter Allan, panel for hunting-seat (model), which also gained the Plasterers' Company's first prize for model,—bronze medal.

Walter Allan, statuette of man and horse, which also gained second prize of 20l. from the Goldsmiths' Company last year,—selected Pilashes and Lacroix's "Arts of the Middle Ages" in lieu of second bronze medal.

Alfred Johnson, painting of figures from life,—bronze medal.

Thomas Trevelyan, model in clay from antique,—bronze medal.

##### Third-Grade Prizes.

William Banks, one compartment of music-room, in monochrome, in competition for the Plasterers' Company's prize,—"Moody's Lectures."

George Catchpole, design for same subject and object as the last (Mr. Catchpole has this year since gained a 10l. prize from the Goldsmiths' Company),—"Moody's Lectures."

Joseph Holgate, group of models in sepiæ,—"Perspective."

Joseph Holgate, outline of ornament from east,—"Painting Explained."

Alfred Johnson, shading from east,—"*Anecdote Lives*."

Alfred Johnson, shaded drawing from ornament,—"*Dictionary of the Arts*."

George E. Lawrence, architectural drawing,—"*Art Tour in Normandy*."

Albert D. Smith, drawing of architectural ornament,—"*Art Tour in Normandy*."

##### Second-Grade Prizes.

Robert Stephen Ayling, geometry,—third-grade, perspective, and certificate for second-grade freehand, perspective, and geometry.

Benjamin Arthur Colley, perspective,—drawing-board and squares, and certificate for freehand and perspective.

Walter Hugh Squire, freehand-drawing,—Cotman's "Outlines," and certificate for freehand.

Phillip Charles Watts, freehand-drawing,—box of colours and certificate for freehand.

##### Second-Grade Certificates.

William Joseph Ferguson, freehand-drawing, perspective, and model-drawing.

James Thomas, full second-grade, four subjects.

William Toggood, freehand and model drawing.

##### Building Construction Prizes.

Robert Stephen Ayling, building construction, elementary,—Purser's "Glossary."

Albert D. Smith, building construction, advanced,—"*Wrought-Iron Work*."

##### Museum Sketching Club. Annual 6l. 5s. Prize.

George W. Ward, best set of sketches,—books purchased with the 6l. 5s.

Canon Barry, after the distribution, addressed the students at some length. He said that he accepted the invitation to be present for two reasons,—firstly, that to any one who bore his name the claims of architectural art must always be peculiarly strong, especially under the shadow of the great tower of Westminster; and, secondly, because he was associated with the services of that glorious Abbey so near them. He had now arrived at that period when the prizes of life had not that charm for him they formerly possessed, but he well remembered the encouragement and help they gave, partly because they were a kind of test and reality of work done, and partly because they signified appreciation. Prizes had an important function in the process of education, but to those who had failed to obtain them he would say that if they had been sincere, earnest, and honest in their work, they had gained in knowledge, which, after all, was the main object of attending a school of art. As to the function of schools of art discharged, perhaps there was an advantage in listening to the remarks of one who, speaking as a layman, had an interest and a sympathy in art. Lay opinion was thought to be a valuable corrective of the supposed vagaries of ecclesiastical opinion, and he hoped that the expression of opinion on art subjects as they appeared to the lay and educated mind might not be without value to some present. He

did not suppose that schools of art were likely to make any great artists; they would not create, although they might discover and help, a heaven-born genius; but one function of these schools was undoubtedly to help to create a general atmosphere, so to speak, of appreciation, of understanding, and criticism of art, without which, if history might be trusted, great artistic achievements were very seldom made. In all great movements in science, art, or statesmanship, they wanted, according to the old proverb, both the hour and the man. By the union of the two great artistic advance had always been made; it was the atmosphere of artistic feeling which encouraged those whose names were in every mouth. He hoped and believed that in this nineteenth century something more than a general artistic appreciation of schools of art, which were doing a most useful work, would follow. He could remember the time when undoubtedly in England there was far less artistic feeling and far less appreciation of art than there was at the present day, and when in London any attempt to break through the bald, ugly monotony in respect to architecture were few and far between; when it was thought wasteful to spend any of the public funds even on the care and decoration of the parks, and on picture galleries and museums. At that time any attempts at artistic culture were looked upon as visionary, obsolete, and out of all question; but within the past thirty or forty years there had been an enormous change in this respect. Schools of art had been partly the cause and partly the effect of a more general diffusion of artistic sympathy, otherwise they never would have been created, and of all the many debts they owed to the late Prince Consort there were perhaps few greater than that due to him for teaching with authority those who ruled the destinies of this country the importance of the cultivation of art in promoting the happiness and welfare of the people. Schools of art had sprung from that movement and had directed and guided it. He (Canon Barry) rejoiced in the fact that the school of art connected with that Museum was in a flourishing condition, and that the Clothworkers' Company had resolved to grant a subsidy of 20l. per annum for five years, "in the full hope and trust that other companies and individuals will contribute the residue of the modest addition of 100l. per annum" which was required. The Architectural Museum had a magnificent set of specimens, which had not been collected without the expenditure of much time and talent by the leaders of the architectural profession, whose labours had not been in vain. Many of the students no doubt attended these art schools for the technical training which they abundantly furnished. If they were to hold their place in the world, either in manufacture or art, they must guide native skill by some knowledge of scientific principles and artistic taste, unless they would be distanced by Continental rivals. As to technical skill and taste, art schools were admirably qualified to teach both. He urged the cultivation of the imaginative faculty, which he considered necessary for a thorough artistic education, and also the cultivation of beauty, which was the most important factor in individual progress and national welfare. Those persons who raved about sunflowers and languished over lilies were getting their meed of satire, which, he hoped, would do some good; but while exaggerations should be chastised they did not want the popular mind to swing backward and forward in regard to art culture. He hoped students would cultivate what was useful and beautiful in art. He did not think that architecture was so liable to extravagance as the other arts. The architect had to unite the claims of beauty with those of usefulness, and the two had to be studied together; he had to study the question of finance and be subjected to more interference on the part of employers than was the case with any other art. These conditions tended to sober the work of the architect, and to keep it from extravagance and vagary. While sculpture and painting must necessarily appeal to the comparative few, architecture, from the nature of the case, was, like music, the art of the many; it had to appeal to the verdict of public opinion and taste. In conclusion, Canon Barry expressed his hope that the art school connected with the Architectural Museum would conduce to the real progress and welfare of the community.

Mr. J. P. Seddon, in proposing a vote of thanks to the chairman, looked forward to a promising future of that art-school, particularly as their

\* Such is the opinion of the writer who, in the *Nouvelle Revue* for Jan. 15, 1882, has reported the Geological Congress, mentioning incidentally the "find" of which we speak above.



pecuniary difficulties were now somewhat lightened. They had secured a new lease of the premises, and had largely increased the accommodation for the students.

Mr. Maurice B. Adams, in seconding the resolution, referred to competition, stating that not only had they to compete with European but also with American and Indian architects, and therefore he urged the better cultivation of native talent.

The vote of thanks having been carried, Mr. Randall Druce announced that their president, Mr. Beresford Hope, M.P., had again offered a prize of one guinea for attendance; while Mr. Allen, a builder, had contributed two guineas for the purpose of a prize to be determined by the committee.

The proceedings then terminated.

#### THE CONSTRUCTION AND ARRANGEMENT OF THEATRES.\*

THE frightful catastrophe by which our city was overtaken on December the 8th, 1881, has once more brought the question of the construction, arrangement, and safeguarding of theatres into the foreground. The purely humane aspect of this terrible misfortune has found expression in a most touching manner by general sympathy and energetic momentary assistance. But the public have also come to the conclusion that something more effectual must be done, and some measures taken as will render similar calamities impossible in the future. Although there is every desire to meet the case, and to expiate the heavy guilt of neglect, it is, in the first place, necessary to recognise the conditions demanded for the full safety of a theatre-going public. In order to arrive at this knowledge, it is requisite to investigate the causes of fires in theatres and the accidents connected therewith, the consideration of which forms the first portion of the labours of the committee. From the teachings of these sad statistics only will it be possible to point out those arrangements and measures which might tend to ward off such dangers in the future from the public frequenting theatres, or at least to reduce such risks to a minimum.

Owing to the limited time placed at their disposal for inquiry and deliberation, the committee will only be able to state general views; but they hope, nevertheless, to give a practical direction to the always well-meant but frequently dilatory efforts for improving our theatres which are now being made on all sides. Although on this occasion they will scarcely be in a position to say anything essentially new, and many references must be made to sufficiently known facts, a general view may be obtained of universally-recognised rules for the construction and arrangement of theatres by a correct elucidation of such facts and a suitable grouping of all data. The present time appears likewise appropriate for at last carrying into execution all that has so long been proposed for the protection of the public and all desirable reforms in theatres. The committee, for this reason, do not consider it necessary to connect its investigations into the causes of similar catastrophes with the circumstances, not yet fully explained, attending the fire in the Ring-theatre. This case is by no means an isolated one; it forms a mere link in the chain of accidents in theatres, which may be explained by their structural conditions, and by which the public are temporarily frightened out of the habitual recklessness with which they seek pleasure in dangerous buildings, without even the most necessary steps being taken for a radical remedy after confidence has returned.

Fires in theatres are by no means of rare occurrence; they are as old as our modern habit, dating from the middle ages, of constructing and arranging theatres, and are most intimately connected with this system. The history of the classic theatre, even, tells us of fires in theatres, and the frightful catastrophes connected with them. But it was from those recurring and sad experiences, and in correct appreciation of what was required, that the instructive and wonderful system of the ancient theatre was developed, which was designed for the presence of large masses at representations, as well as for accessibility, and by means of which, owing to its sensible arrangement and

architectural construction, fires and similar accidents, to which our modern theatres are liable, were excluded. Most of those ancient theatres were utterly destroyed by the fall of classic life, and but few massive ruins of those wonderful structures have been able to defy the storms of twenty centuries. Our modern theatre may in many respects, especially as regards durability, be looked upon as the very reverse of the classic theatre. It originated in quite different conditions. As the classic theatre had for its exit the bottom of the valley, and as this natural formation, so suitable for large masses and corresponding accessibility, found architectural expression in permanent theatres, so our modern theatre was principally developed out of the courts of monasteries and similar courtyards used for the representation of passion plays. The roofing in of such courts, as well as the transformation of courtyard windows into boxes, has gradually led to the modern system of construction, which in its essentials has remained unchanged for the last two centuries. The scenic requirements, which have grown especially within recent times, and more particularly those for illumination and lighting effects, have enormously increased fire risks in theatres; while in old-established theatres the antiquated system of communications, which does not adequately provide for the safety of the public, has remained essentially the same. The ancients possessed a wonderful power of adaptation, which enabled them to develop their buildings by the experience gained in provisional wooden structures, suiting what they had to requirements, and thus proving their title for architectural development.

The same cannot, unfortunately, be said of the modern theatre. The ever-recurring calamities in theatres, ever increasing in intensity, fully prove that the planning and construction of modern theatres have not kept pace, even proportionately, with their constantly increasing dangerous nature; that strikingly little use has been made for these structures of the great progress achieved by the architect and engineer; that the frequently very rich and costly exterior, which gives to a theatre the appearance of architectural merit, is in no proportion to the condition of its interior arrangement, to which is attributed the comparatively short life of our theatres. Herr Fölsch, in his excellent work on "Fires in Theatres," states the average age of a theatre at 22½ years, which agrees nearly with the age given by Signor Rignone for Italian theatres, namely 22 years. With this fact before us, it seems strange that millions are spent on buildings of such a perishable nature, and that the life of the theatre-goer, in whom the monumental appearance of such structures gives rise to something like a feeling of safety, should thus be exposed to existing dangers, while, at the same time, and principally, that safety ought to be attained by improving the interior arrangements. Not until then should the modern theatre be treated, like its classic model, architecturally. Although it cannot be overlooked that in newer theatres, as compared with older buildings, essential improvements have been effected,—as, for instance, the auditorium is made fireproof, and the communications are improved upon,—a more careful consideration will lead to the conclusion that even in the largest and most handsome edifices of this description it has not been possible to exclude the fear of accidents, and that a coincidence of unfavourable circumstances would give rise to serious catastrophes. To indicate them in a few words, it need only be pointed out that the stages of all theatres of the present day, from surrounding conditions contain the origin of their destruction. But even the parts of the theatre intended for the public, although they are said to be constructed fireproof, and are spacious in some parts, do not supply a sufficient guarantee in cases of serious danger. The spaciousness only benefits the public using the boxes and stalls, while less care is taken of the upper tiers and galleries.

A few data taken from the work of Fölsch will suffice to prove by statistics what has been stated. We find there a list of 460 theatres totally destroyed during the last 100 years. But the danger of fire is permanent, and a conflagration is mostly nipped in the bud by constant supervision and instant quenching of easily-kindled fires; but should this fail, should the fire once seize upon larger portions of the combustible materials or parts of the building, the doom of the theatre is sealed. Experience teaches that fires in theatres, if once developed,

cannot be extinguished, and those 460 cases cited by Fölsch have only ended in the complete destruction of theatre buildings. As in the list mentioned there appear also important theatres constructed according to most recent plans, which, in spite of all supposed improvements, could not be saved from complete annihilation, there can be no longer any doubt but that the cause must be sought in the system upon which stages are arranged. This supposition is confirmed by the fact that the number of fires in theatres and their destructive effect are continually on the increase, which may be partly explained by the multiplication of theatres, but which also proves that rational progress in removing the element of danger has not been made, as the following statement shows:—

For the years 1781-1770 are noted 8 fires in theatres.

" 1771-1780	" 9	"
" 1781-1790	" 11	"
" 1791-1800	" 13	"
" 1801-1810	" 17	"
" 1811-1820	" 16	"
" 1821-1830	" 30	"
" 1831-1840	" 25	"
" 1841-1850	" 43	"
" 1851-1860	" 67	"
" 1861-1870	" 97	"
" 1871-1877	" 93	"

Since the beginning of 1871 to the middle of October, 1877, on the average, more than thirteen theatres have been burned down each year. With regard to the commencement of fires, Fölsch has collected the 289 fires of which such particulars are supplied into five groups, as follows:—

1. Begun during the day	58 fires, or 19·4 per cent.
2. Begun an hour before ad. missing the public	15 " 5·3 "
3. Begun during representation	38 " 12·4 "
4. Begun two hours after representation	69 " 23·9 "
5. Begun during the night	118 " 39·1 "

It will be seen from these figures that, fortunately, the percentage of fires during representations is a proportionately low one, which is explained by the greater care bestowed by those in charge during the presence of the public; while the largest percentage is that of fires during the night, at a time when, consequently, there is the least supervision, and a conflagration may most easily break out from burning materials left from the representation. A third statement gives—

138 fires, or 34·4 per cent., from January to March;
100 " 25·3 " April to June;
70 " 17·8 " July to September;
90 " 22·7 " October to December;

from which it may be seen that fires in theatres are most frequent at the height of the theatre season, and most probably in proportion to the danger increased by warming the building.

If we inquire into the causes of the origin of such fires, and the fatalities attending them, it will be found that, with few exceptions, the fire has originated on the stage, which will give surprise to no one who has ever cast a glance at the enormous mass of combustible and easily inflammable materials there heaped together, and the dangerous manipulation of naked lights. To this must be added the manipulation of changing gaslights effected by india-rubber pipes, of fireworks and other explosive materials, the entirely unavoidable escapes of gas, and, finally, explosions of gas actually taking place. The danger of fire on stages is so great in consequence of existing arrangements and the habits of those engaged there that we need not wonder at the large, but rather at the comparatively small, number of really developed fires in theatres. It depends, indeed, upon the skill and the presence of mind of the persons engaged there if the nightly-recurring danger is mostly fortunately averted from the public. But if once the fire gets hold of the stage, and if the latter cannot be shut off immediately fireproof from the auditorium, which has not at present been achieved in really developed conflagrations, the flames turn by natural laws towards the auditorium, which acts, in consequence of the ventilating-shaft over the chandelier, like a chimney, and the fate of the theatre is decided. Although the theatre is supposed to be constructed fireproof, such constructions do not withstand the enormous intensity of the flames, and the complete destruction of theatres is a fact hitherto disproved in no single instance.

The value thus consumed by fire, which is estimated by Fölsch for the last 100 years at 25,000,000*l.*, recedes into the background before the thousands of human lives which have been lost in such catastrophes. Up to the present

\* Report of the Committee appointed by the Austrian Society of Engineers and Architects (Verein) to inquire into the principles to be recommended in the construction and arrangement of theatres with a view to safety.



there has been no fire in a theatre during a representation in which the loss of human life has not had to be deplored. This sad fact will cause no surprise if we examine more closely the condition of our theatres. The flames, fed by the masses of inflammable materials, especially as long as they do not find a way through the roof into the open air, develop enormous quantities of smoke and deadly gases, which must fill the auditorium so rapidly that, even with numerous exits, an escape of all those present in the theatre is much to be doubted. But in very many theatres the communications are in no proportion to the public which must pass through them. The least provision is made for the gallery public, who have to take the longest way before reaching the open. Very frequently one flight of stairs serves for several galleries, or several stairs give on to a common passage, where, naturally, conflicts are unavoidable when several human streams rush forward at the same rate. Although such arrangements may suffice under normal conditions, the need for ample and practically constructed communications increases materially in the hour of danger. The public, seized by panic, rush in blind haste to the exits, and if there are not a sufficient number of them and of stairs, or if they are not of such a condition as to allow the human stream to move forward undisturbed by the pressure of the masses behind, until it reaches the open, there is no chance of escape for those unfortunate. If such communications are not constructed in simple and natural curves and divisions, or if they consist of unequal and too many flights and landings, or if they are interrupted by intervening steps, they may become causes of the greatest danger. The public, pushing and rushing, falling and falling, and the masses coming up from behind soon form a coil that cannot be disengaged. While, under normal conditions, notwithstanding all obstacles caused by existing arrangements, a theatre may be emptied in five minutes, that short delay of time becomes fatal in the moment of danger. A wall of human beings thus formed prevents those behind from escaping; they look despairingly for openings, and, if they do not find them, perish miserably. The fate of all those thus arrested, if they are not crushed or trampled to death, is death by suffocation, for, in the atmosphere which develops itself in the theatre under the conditions described no human being can exist long. For this reason, open flames, which cannot be fed by such air, must soon become extinguished. It has been proved that during such events the gas is frequently deliberately turned off, which increases from the first the confusion of such catastrophes and the despair of those in the theatre. When, under the conditions mentioned, no more persons were seen to come from the lobbies, the erroneous conclusion was very frequently come to that the theatre was empty, which, at Carlisle in 1847, gave rise to the cruel measure of firmly closing all doors, in order to shut off fresh air from the flames. The frightful phenomena of fires in theatres may consequently be very simply defined. A mass of the most inflammable materials is accumulated in theatres; gas lights, a vital element of the modern stage, are constantly playing around them, and the thousands of human beings who are crowded together in a narrow space find in case of need very seldom those arrangements which would enable them to save their lives.

Our police building regulations are, on the whole, perhaps the most severe in existence. Notwithstanding a certain ponderousness—which restrains the liberty of the individual, and sometimes adds to the expense of building—however, they have effected much good, especially with regard to the prevention of fire. What violent contrast is presented by the permanent danger in our theatres! For simple private residences there exist severe regulations, but in our theatres at the present time, no precaution is adopted which would confine a conflagration to its several parts. The use of fireworks is strictly prohibited throughout the city; on the stage, the most dangerous place of any, it is permitted. In the smallest dwelling the construction of stairs and landings is ordered by strict, almost contemptible, regulations; in theatres, where there is often assembled the population of a small town, stairs are erected which would not be sanctioned in an ordinary dwelling. Under such conditions, we need not wonder that fires in theatres are of frequent occurrence, and that they generally end in frightful calamities. The horrors of December 8th will probably have created such an impression as to lead to effec-

tual reforms. The recommendations here appended may serve for future guidance.

The removal of the dangers above pointed out requires strong measures, which should have the aim of diminishing the dangerous nature of theatres, and which would either prevent the breaking out of fires or serve to nip them in the bud. But it involves likewise the necessity of designing theatres in such a manner as would confine a fire, should it break out notwithstanding the measures of safety adopted, to the spot where it originated, and as would enable the public assembled to leave all the parts of the house in safety. It appears from the programme thus laid down that reforms are necessary both in the construction of theatres and in their supervision and administration. As human power and human aid in times of extraordinary panic have been shown always to fail, it is imperative that our principal efforts ought to be concentrated upon rational reforms in the construction of theatres, leaving to human agency only a minimum share of co-operation.

In entering upon the measures thus briefly sketched out, we must, in the first place, bear in mind the diminution of fire risks. In this respect the principle ought to be laid down that theatres should be erected completely isolated, and be as far as possible from other buildings. Although there may be exceptions in the case of smaller theatres, and if proper precautions are adopted, the isolated position of a dangerous object exercises a tranquillising effect both upon those assembled in theatres and upon the neighbourhood. The history of fires in theatres fully shows what ruin has been wrought by them amongst the surroundings, and how fires originating in neighbouring buildings have proved fatal for theatres. By what follows it will be seen that the isolation of theatres is a necessary condition for suitable and practical communication.

The removal of all inflammable objects that may be dispensed with, or rather their diminution to a minimum, may be looked upon as another step for lessening the dangerous nature of theatres. According to this principle, the usually very large quantities of piled-up decorations or properties, the store-rooms filled with costumes and other easily inflammable materials, the painters' rooms, workshops, and other objects which carry danger with them on account of the nature of the material of which they are made up, or of their manipulation, must be removed from theatres, and the articles deposited in the latter limited to those in daily use.

It cannot, further, be denied that a great part of the building and the machinery on the stage may be constructed of iron, instead of, as hitherto, in wood. But wherever it is considered necessary that wood should be employed, it must be protected by impregnation. It is a well-known fact that this mode of protection may also be extended to the linen cloth used for decorations, as well as to all the other easily-ignited materials. It is likewise known what amount of resistance this protective coating has met with on the part of painters, costumiers, and experts in theatrical matters. But those precautions will have to be finally adopted; the practical man will know how to deal with the objections raised, and for the sake of safeguarding valuable human lives, old-established habits and scruples must be overcome.

Although, as may be expected, more use will probably be made in future of the progress made by engineers and architects in the construction and arrangement of theatres, the risk of fire will by no means be completely excluded from the stage. But the present state of technical science permits of the assertion that the auditorium may be made perfectly fire-proof in all its essential constructive parts. By other precautions, to be further discussed, that safety for the theatre-going public might at least be obtained which is based upon the principle of keeping fire out of the auditorium. As a matter of course, such additions to a theatre as might easily become the origin of fires,—for instance, private residences, store-rooms, restaurants,—would have to be excluded. For the practical purposes of guarding against fire, the stage and the auditorium must be considered as two entirely separate parts of a theatre. The former being supposed dangerous, the latter, on the contrary, fireproof, a complete isolation or fireproof separation of the stage from the auditorium would be the first step to be taken. A party-wall, therefore, which divides the building throughout its whole width

and height,—which, by the bye, is the official rule for every dwelling-house,—becomes a *sine qua non* on account of its great importance in the case of a fire, forming in that instance a complete screen. Beyond the proscenium opening, it should have but few other outlets, the latter, as a matter of course, being shut by iron doors. No connexion whatever ought to be permitted between the attic stories of the stage and auditorium. Experience teaches us that just in this proscenium opening is hidden the greatest danger for a theatre-going public; and the method of properly shutting it off from the auditorium, or rather the iron curtain itself, forms one of the cardinal points in the matter here treated.\*

## UNIFORMITY IN BUILDING AND SANITARY REGULATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the seventh ordinary meeting of this Institute, held on Monday evening last, Mr. Ewan Christian, vice-president, in the chair,

The Secretary announced the decease of M. Hippolyte Durand, of Tarbes, honorary and corresponding member, who was the architect of several churches and other buildings, notably the church at Lourdes, celebrated for its "miracles."

Mr. J. Macvicar Anderson read a long list of names of gentlemen recommended for election as Fellows, Associates, and Honorary Associates.

*The Royal Gold Medal.*—Mr. Anderson also announced the recommendation of the Council as to the Royal Gold Medal for 1882. According to custom, it was the turn this year of a foreigner, and the Council had determined to recommend to the general body the nomination, as the recipient, of Heinrich Freiherr von Ferstel, of Vienna, who has erected a great many public buildings in the Austrian capital. The announcement was received with applause.

*The Pugin Studentship.*—Mr. Anderson further announced that the Council had awarded this year's Pugin Studentship to Mr. Francis Hooper, of Beekenham, the Sharpe Prize, value 10*l.* (in books), to Mr. J. A. Slater, of Bedford-square, who was second in merit; and a certificate of honour to Mr. H. H. Kemp, of Kilburn, who was third.

Mr. Joseph Boulton, of Liverpool, who was announced to read a paper on the subject indicated above, was unable to be present, but the paper was read partly by Mr. White (who explained that Mr. Boulton was not a member of the Institute, but had been asked by the Liverpool Architectural Society,—who had been asked by the Institute to furnish a paper on the subject,—to represent them in the matter, which was of interest just now inasmuch as the Liverpool authorities were promoting a Bill in Parliament with a view to legislation on the matters indicated. If the discussion were adjourned, Mr. Boulton would probably be able to attend.) The purpose of the paper (which was very long, one, and of which we are here only able to give a summary) was, as Mr. Boulton said, the consideration of those regulations which govern the supply of buildings of various kinds, including essential sanitary provisions. Architects about to build had to be acquainted with an indefinite number of existing codes, varying according to the locality. Mr. Rawlinson, O.B., had told him there were 1,000 urban and 600 rural authorities. Including by-laws, the number of varying codes had been estimated at not far from 2,000. It seemed not unreasonable to assume that all local peculiarities might be duly allowed for, anomalies disappear, and all practicable uniformity be substituted, in a general Act. Without attempting to get rid of indispensable technicalities, simplicity should be combined with uniformity, so that the number of regulations might be few and clearly understood.

*Essentials v. Non-Essentials.*—By the recognition of this principle,—namely, the avoidance of all confusion between essentials and matters desirable only,—the Model By-Laws, issued by the Local Government Board, and other like provisions, would lose much of that minuteness which caused them to resemble a carefully-prepared specification. This topic was dwelt on in illustrative general criticisms on typical regulations, to show the tendency to what the author deemed the excessive and at the same time unneeded precaution which seemed to pervade almost all building and sanitary legislation, impeding

\* The conclusion is our next.



most inhumane and very needless restrictions upon important branches of trade.

**Laying out Land for Building.**—The term "over-crowding" had been very much abused by sanitarians, one of whom insisted on setting no more than five families on an acre, whereas model lodging-houses had shown that in such dwellings 1,500 people to the acre might enjoy excellent health. Density of population was to be measured not by area, but by cubic space, which might be indefinitely turned to better account by ventilation and cleanliness. Every additional item in the cost of a house, if not essential, however desirable it might be, increased the difficulty of providing indispensable accommodation for the helplessly poor, and in like manner every distribution of land not consistent with wise economy, and all structural requirements not absolutely requisite, should be carefully avoided.

**Unwholesome Areas.**—By the Metropolitan Building Act, a dwelling-house, unless its rooms could be lighted and ventilated from an adjoining street or alley, was required to have at the rear or side an open space, exclusively belonging to it, of at least 100 square feet. If any space were to be retained it could not be less; but Mr. Boulton's observation had convinced him that small open areas, instead of conducing to health, became harbours for filth, which, being constantly damp, through exposure to rain, often fermented and generated noxious effluvia. Besides, such a requirement hindered the erection of flats, such as those in Professor Cookerell's *opus magnum* at Liverpool,—the Liverpool and London Chambers. There should be as little interference as possible with the convenience of the public, and that convenience would be better secured by greater width of street, when practicable. Besides, it was useless to provide the means of ventilation for people not intelligent enough to make use of them. Various provisions in the Model By-laws, the Metropolitan Building Act, the Towns Improvement Clauses Act, and in provincial Acts and By-laws, seemed due to two conspicuous and deplorable causes,—first, the absence of careful and systematic inquiry into the reasons why certain urban and suburban districts are especially healthy or unhealthy; and, second, to foregone conclusions proved by experience to be untrue.

**Damp-course.**—In the absence of any really scientific investigation into the effect of dampness in walls, of laying concrete all over a building site, and of covering drain-pipes with concrete, it was not possible to show their sanitary necessity; and such nostrums of superstitious empirics should not be enforced on those more familiar with structural requirements. From this point of view criticisms were offered on the by-law framed under the Metropolitan Management and Building Acts Amendment Act of 1878, on the Model By-law, No. 17, and on others recently proposed by the local authority in Liverpool. A general regulation that effectual precautions shall be adopted to prevent damp rising into any wall seemed to meet the necessities of the case.

**Foundations.**—The discrepancies between eminent authorities on this subject provided a further illustration of the difficulty of framing minute rules. They seemed to show the wisdom of using more general language, such as that every site shall be thoroughly drained, and every building erected on a good solid foundation, artificial or otherwise; where requisite, the site should be covered with asphalt, concrete, or some other suitable material.

**Drains.**—The material, size, mode of laying, finishing, and ventilation of drains, were all items worthy of much more intelligent consideration than they seemed to have received from the framers of various enactments. The first condition, governing every system of drainage, involved the requirement that all parts of the building should be above the sewer into which it was to be drained. But this involved the liability of the local authority to put their sewers in at such a reasonable and practicable depth as not to deter building-owners from having reasonably deep basements. A sufficient check on any imprudent wish to build down to an excessive depth would be a proviso that every building should be properly drained. The material for drains and public sewers should be impervious to air and water. For inverts, good cement concrete seemed most suitable. The purpose of traps seemed very imperfectly understood by those to whom our sanitary legislation was entrusted, and no less so the real object of ventilating the drains and sewers, as was pointed out

in various particulars. It seemed to follow, Mr. Boulton said, from his reasonings that:—1. Traps should be placed as far as possible from the outfall, and as near as possible to the infall, so that the water discharged may pass away with the utmost possible momentum and velocity. 2. The connexion between the infall and the sewer should be unbroken by any communication with the external air, except the ventilator external to its trap, so that the passage of atmospheric air from the sewer to that ventilator might be as rapid as possible. 3. Wherever practicable, the pipes which convey the refuse into the drains should be used for ventilation. Even where the water discharged through a ventilating-pipe from the roof, or from a lavatory, was but small, it was still useful, because descending in a spray, like lead in a shot-tower, it caused agitation in the air with which it came in contact. He thought every system of drains should be provided with the means of flushing all its branches. The Model By-laws contained two elaborate schemes for the ventilation of drains, neither of which, he argued at some length, was practicable under all circumstances. A careful examination of these by-laws disclosed a compromise between conflicting advisers; thus only could their inconsistencies be explained. The undue influence of members of the medical profession and of other theorists was palpable, and in the interests of true sanitary science itself it was high time architects and engineers should be required to assume their legitimate responsibilities with respect to legislation on such matters.

**Plumbers and Drainers.**—It was not easy to over-rate the importance of having all plumbing and draining well executed, but under existing arrangements the difficulty of securing good work and material was almost, if not quite, insurmountable. In the United States plumbers were licensed. In Liverpool none but "authorised" master-plumbers were allowed to undertake work connected with the water supply. Mr. Boulton thought the supervision of pipes and fittings too minute, but the principle of licensing master-tradesmen for all plumbing and drainage seemed a good one, to which might be added other securities for honest workmanship, such as the compulsory licensing of certain artisans, including plumbers, and foremen, gangers, or overlookers in charge of drainage works. If holders of such licences did, or allowed to be done, any bad or dishonest workmanship, they might be made liable to forfeit their certificates, and even to indictment for misdemeanour.

**Modes of Construction.**—The provisions for regulating the construction of houses ought not to enter into such details as the ingredients of mortar and concrete. It would be just as reasonable to specify the kind of timber or iron. The Model By-laws and the Metropolitan Building Act omitted all reference to the quality and strength of timber, and there seemed to be the like laxity as to iron. A special tribunal of skilled experts for each provincial district, with a superior court of appeal sitting in London, might be appointed. To these tribunals might be referred all questions as to materials (old and new) workmanship, parti-ownership, ruinous structures, ventilation, and other sanitary questions; possibly also cases of ancient light and air with other easements.\*

**Classification.**—The importance was shown of the distinct classification of buildings of every kind, and of an interpretation clause. The wording of the Liverpool Fire Prevention Acts, passed nearly forty years ago, made illegal the adoption of any of the modern improvements, such as concrete arching, solid timber blocks, or any of the so-called fire-proof iron and concrete floorings. Nor was it allowable for the doors and shutters to be of concrete, indurated fibrous

\* Mr. White observed, in reference to this matter, that he had just received from Paris the *Bulletin* of the Société Centrale des Architectes, in which there was printed a Decree of the Republic promulgated on the 6th of January last, appointing a council, which would take the title of "Council General of Architects." The council was composed of architects and inspectors-general of civil buildings, historical monuments, and diocesan edifices. By Article IV. it was to be entrusted with the examination of all questions (*controverses*) arising in the practice of architecture and building-surveying; was to give advice, notably upon competitions and their conditions, strikes and wages disputes in the building trades; was to approve of the prices (*tarifs*) for building work done for the State; was to fix the rates of architects' commission and to interpret existing charges; and was to investigate the claims of all new materials and inventions connected with building, methods of artificial lighting, the prevention and extinction of fires, &c. There were, said Mr. White, in conclusion, other articles in the Decree, which, as a whole, served to show that the French, whether they lived under Monarchy, Republic, or Empire, were generally ahead of us in such matters.

plaster, or other incombustible material except iron. Legislation on such subjects ought to be tentative, progressive, and uniform throughout the kingdom.

**Walls.**—The rules for determining the thickness of brick walls, as given in the Metropolitan Building Act and the Model By-laws, seemed very complicated, and capable of being greatly simplified. The obvious principle was that, other things being equal, the thickness of walls should be in proportion to the height; but warehouses, being exposed to much rougher usage than dwellings, their walls must be stronger. Provision should also be made for the exceptional contingencies to which many public buildings were exposed. Mr. Boulton endorsed the rules in the Metropolitan Act for roughly adjusting the increase in strength of cross-walls in proportion to the distance between them.

**Ruinous Structures.**—Though the powers conferred upon local authorities under the Metropolitan Building Act, which were very similar to those given under the Towns Improvement Clauses Act, 1847, had long been found efficient in the metropolis, the Liverpool authorities had actually desired to compel the justices to order the demolition of a structure on the *ex parte* information of their own surveyor, without allowing the owner to challenge his judgment. This was another illustration of the dangerous tendency in authority to become autocratic.

**Projections.**—The rules limiting the projection of architectural and other features laid down in the Metropolitan Act seemed too stringent. Alternative rules were suggested.

**Exempted Buildings.**—The *trindas necessitas*—stability, security from fire, healthiness,—required for all other structures, ought to be imperative upon the exempted buildings also.

**Plans.**—One of the strongest instances of the bureaucratic spirit inspiring the Model By-laws was to be found in the requisitions for plans and other drawings for intended streets and buildings. It was very much to be regretted that the extremely moderate suggestions for their amendment which emanated from the Institute of British Architects were not accepted by the Local Government Board. It was lamentable to see any department descending to such petty inquisitorial details,—a proceeding more like the officialism of some small foreign State than the reasonable requirements of a constitutional Government. Nothing more conclusively showed how much some influential persons had lost discretion under an irrational panic and its offspring, a no less irrational mania. Every local authority ought to possess a plan of its district, such as is described in the Towns Improvement Clauses Act, 1847, for which a scale of 60 in. to the mile is specified, reference to which would render needless many vexatious requirements, such as were copiously exemplified under this head.

**Surveyors of Buildings.**—In the appointment of surveyors to assist the local authority in enforcing the provisions of a General Building Act, there should be a better guarantee for their competency. There were cogent reasons against the management of local affairs by a Government department exclusively, but a blending of the imperial and local systems could be so adjusted as to be highly beneficial. Mr. Boulton's preference was in favour of the system which had long prevailed in the metropolis, and was apparently justified by results. In very populous districts more than one surveyor would be required, whilst, where there was little building, districts might be grouped together. In any case, the gentlemen selected should hold certificates of competency from the Institute of British Architects. In winding up his paper, Mr. Boulton reminded his audience that the enactments reviewed were meant to confer on the local authority great powers for the public good, but the manifest lack of what lawyers term reciprocal covenants led one to ask, *Quis custodiet custodes?* In the interest of the public health, and on other grounds, a simple and inexpensive method of bringing peccant authorities to book was an absolute necessity. For, however perfect, structural and sanitary enactments were utterly worthless if not enforced with uniformity, impartiality, and intelligence. Expressing his full appreciation of the distinction of having been asked to undertake the task he had now completed to the best of his ability, the author trusted that any omissions or defects in his tentative essay would be largely rectified in the discussion. If a uniform system for regulating the structural and sanitary



arrangement of buildings was essential, the first step was to determine the principles on which that system should be framed, and to these he had sought to direct attention.

In the discussion which followed,

Mr. Gordon Smith, Architect to the Local Government Board, said that while Mr. Boulton's paper contained much with which he cordially agreed, it contained a great deal with which he could not agree. Mr. Boulton had taken exception to some of the Model By-laws issued by the Local Government Board, but was apparently unaware that they were based on the requirements of the Public Health Act. Mr. Boulton seemed to have overlooked the fact that the by-laws were intended to be progressive, and to meet the wants of buildings not yet erected. As to Mr. Boulton's contention that it was unnecessary to require that water-closets should be placed against external walls, he (Mr. Gordon Smith) was quite prepared to maintain that the requirement in question was a most necessary and important one.

Mr. Lacy W. Ridge spoke of the unnecessary demands made upon architects by the by-laws of local Boards for complete sets of drawings, and related how, on a recent occasion, he had not only declined to comply with such a demand, but had so fully convinced the Board that it was unnecessary and unreasonable, that in future such demands would not be made, at any rate by the Board in question, on other architects. In too many instances sets of drawings sent in compliance with local by-laws were merely pigeon-holed by the surveyor,—not, it was to be hoped, with the intention of ever using them for his own purposes. In conclusion, Mr. Ridge moved a vote of thanks to Mr. Boulton for his paper.

Mr. E. C. Robins, in seconding the motion, said the paper contained a great deal of valuable and suggestive matter for contemplation, and he had no doubt that if the discussion were to be adjourned, a profitable evening could be spent, and perhaps Mr. Gordon Smith would be able to attend again and enter more fully into the matter than it was then possible to do. He thought that the majority of the members of the Institute might disagree with Mr. Boulton on some points, but he thought they would agree with him in the main.

Mr. White moved, and Mr. Macvicar Anderson seconded, a vote of thanks to Colonel Prendergast for having assisted in the reading of the paper.

The Chairman said he certainly could not agree with Mr. Boulton in his apparently depreciatory remarks about damp-proof courses. This was a matter to which he (the chairman) had paid very great attention, and he not only was prepared to insist upon horizontal damp-courses, but, in certain cases, upon vertical damp-courses, formed by leaving a cavity in the wall and filling it with asphalt as the work proceeded. He had repeatedly tested the efficacy of such a method of construction. One instance was in the offices in Scotland-yard for the Ecclesiastical Commissioners, built by him about five-and-twenty years ago. There they had to go down about 25 ft. through a mass of what was little better than Thames slush. The deep basements there were found to be perfectly dry, and were used, not only for storage purposes, but for some of the departmental work. He might say that in this case the outside wall was 14 in. thick, the inside wall 9 in. thick, with a 2-in. cavity between them filled with asphalt, which held so tenaciously to the brickwork as to unite the two walls into one solid structure.

The discussion was then adjourned.

#### THE SURVEYORS' INSTITUTION.

THE Students' Preliminary Examination for 1882 was held in the Hall of the Institution on the 24th and 25th ult. The passing of this examination is the condition of enrolment in the class of students. Of the thirty candidates who entered, the following, whose names are given alphabetically, satisfied the examiners, viz. :—

F. A. Bontor, London; E. V. D. Bousfield, London; W. G. B. Bousfield, London; J. C. Bryan, Sunderland; A. Brymer, London; S. Clarke, London; W. T. A. Cross, London; W. Day, Maidstone; H. A. Drew, Exeter; B. G. Grey, London; L. G. Hamrick, New Barnet; G. A. Landon, Wimbledon; H. E. Moore, London; J. H. Moyes, Ely; W. G. S. Rolleston, Leicester; E. C. Rundle, Tavistock; F. W. Welch, London.

These candidates will be expected to present themselves for the final (technical) examination at or near the close of their student course.

\* Passed at the head of the list.

#### A CHAT WITH YOUNG ARCHITECTS ABOUT SPECIFICATIONS.

ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association, held on Friday, the 3rd inst., Mr. Aston Webb, president, in the chair, several gentlemen were nominated for election as members.

With regard to the Saturday afternoon visits to buildings in progress, Mr. W. H. Atkin Barry, one of the hon. secretaries, gave notice that all members who wish to be present on those occasions must provide themselves with passes (for the current session), and must be prepared to produce them when called upon. Any member may obtain a pass on application to either of the secretaries.

Mr. Ewan Christian then proceeded to give an address (more especially to the junior members of the Association) on the writing of specifications. He said that when asked to give a lecture on the subject, it at once brought to his mind very vividly the recollection that specifications were one of the bugbears of his youth. He remembered perfectly well, though it was not less than fifty years ago, the horror with which he once regarded a specification, and he recollected speaking to the elderly gentleman who was at the head of the office in which he was articled, and asking him with great trepidation whether he should ever be obliged to write such documents, which appeared to him then to be unintelligible pieces of jargon. He was a cheery old fellow, and he made reply, "You never know what you can do till you try!" And so he had found. And it was also true that one never knew what he could not do until he had tried and failed. His subject was "A Chat with the Younger Members of the Association on Specifications," and he proposed, firstly, to say a few words on specifications in general; secondly, to take up one in particular and go through its general provisions; and afterwards to make some few observations on some methods of acquiring the necessary knowledge for writing such documents. Possibly some of his young friends might think he had chosen a very dry subject to discourse upon, and his elder brethren might deem him a bore for talking about an everyday business of which they probably knew as much as himself. He must ask the forbearance of both, and would endeavour, in the treatment of his theme, neither to be dry to the young nor wearisome to the elders. Now, in the carrying out of an architect's design, the specification, properly considered, was the very pith and marrow of the building operation. The first sketches might be said to represent the poetical or inventive part of the work; the working drawings and the specification, which should always go hand in hand, were the hard and laborious filling-out and filling-in of the first ideas, and each would have its compensation for the man who really loved his work, and who was content to carry it all through by himself. It had fallen to his (the speaker's) lot to read many specifications from many hands. The much-lamented President of the Institute, Mr. Street, had very truly said that an architect was known by the work he executed, and so, also, something about him could be known by his specification. He would describe some with which he had made acquaintance. First, there was the careless specification, the production, possibly, of the man who thought his art so high that he could not condescend to things so low, and so gave himself no trouble in the matter, wrote in the loosest possible fashion a few vague sentences, and necessarily, in consequence, ran the risk of heavy bills for "extras," and of giving much general dissatisfaction. He hoped there were no such specification writers present. Next, there was the uncertain specification, from the man who, not knowing his own mind, left everything vague, and said that such and such things were to be done "as the architect may hereafter direct," or that everything was to be done that was or ought to be necessary for the completion of the work, whether mentioned or not. But what was the poor builder to do in making his estimate from such a document? What a chance for wild estimates and after-litigation! Then there was the surveyor's specification, which he always knew by the clause, "Provide water for the work"—as if it could be done without water! If everything had to be provided, why should water be so specially mentioned? This was generally a practical and dissection specification, but with no warmth or geniality about it. Then there was the muddled specification, which it was a positive torture to

read, and in which one had to hunt through page after page to find the proper sequence of things, and, when found, had sore trouble to put them together. Then there was the too-diffuse specification,—that which said, over and over again, that this thing and that thing were to be provided and done in the best possible way, when one clause to that effect would be sufficient. Such a specification was a trouble to read, but one forgave its wearisomeness in respect for the earnestness of the writer. Next, there was the plain and practical specification, which went straight to the point it was intended to reach, and said exactly enough, and no more,—the writer being evidently a good business man who did his work thoroughly well, wasted no time, and had no difficulty in settling his accounts at the conclusion. Lastly, there was the well-written and properly descriptive specification, the writer of which evidently enjoyed his work, wrote it *con amore*, revelled in the pictures he summoned up as he went on, and filled his pages with sketches to illustrate his words. Such specifications were a real pleasure to read, because one saw that the writer was brimful of happiness in doing his work, as all ought to be if their work was to be done really well. Now, these were not fancy pictures, for he could fit most of them to practising architects, but he only quoted them as illustrations of the fact that specifications were not necessarily dry, and were certainly not wanting as indications of character. But now, to take a more serious and, he hoped, instructive view: What was a specification, and who could write one so that it should be useful? Let them consider the ordeals which the document had to encounter. First of all, it had to satisfy the client,—not, possibly, for his own reading, but to defend his interests in the work which the architect had been entrusted to do for him. It should be remembered that clients sometimes attached strange meanings to doubtful descriptions. Secondly, it had to be put before the builder, who, if he were an honest man, would do his best to carry out its provisions faithfully and well; but if he were a scamp, he would try to evade them at every turn, and would be sure to go through any loophole that had been left. Thirdly, it had often times to be interpreted by workmen; they might be intelligent or they might be the reverse, and then, woe to the man whose work was slightly done. It was all very well to put in a clause that the architect was to be the sole judge of everything; so he ought to be, but if he had left room for misinterpretation, and mistakes were consequently made, as an honest man he ought to decide against himself, and not blame the workman. Lastly, together with the drawings, the specification had to be the basis of a contract. Some employers, and possibly some architects, thought that the contract was the lawyer's work exclusively, and that he was to be responsible if anything went wrong; but he (Mr. Christian) said "No!" The lawyer might put in his stringent clauses, might provide for bondsmen, and set down penalties to be exacted in due course; but if the specification was imperfect, the foundation of it all was rotten, and all the legal phrases in the world would not make it stand. Not that he despised the lawyer's work,—far from it; it might be, and was, in many cases, very necessary, but the specification and the drawings were the basis of contract, and the general conditions might be fairly left to the lawyer, though not even those without the architect's co-operation. A specification, then, was, or ought to be, a document which should fully and completely describe the architect's intentions, illustrated by the drawings, of what was to be done from the time of cutting the first sod to the delivery of the key of the finished work into the owner's hand. That was what a specification ought to be. Who was the man who could write it? "Oh," perhaps some of his hearers would say, "the surveyor; he is the man who must know all about it; he dissects the work, describes its bones and sinews, and clothes them with flesh, and so in due course it comes out all right from the builder's hands." But, did it? And whose, then, was the work? At best it was but a partnership concern. No; if his young friends had learned the surveyor's work in addition to their own, by all means let them do it,—nothing was more practically instructive, but if not, let them never, in their younger days, depute the writing of their specifications. If they could not do it themselves they had not learned their business perfectly, and ought not to practise it, because



they could not do their employers justice. It would be plain, therefore, he (Mr. Christian) thought, that so far as his judgment went, the person who wrote the specification should be he who designed the work; and so far as regarded its chief points,—those in which his design was out of the ordinary track, where individuality was to be exemplified,—so it must be to his life's end. He wished it to be remembered that he was speaking to young men, who had yet to win their spurs by hard and resolute work. When they were older they might shorten their labour to a great extent by the assistance of others; but to do so effectively, and to depute with propriety, they must be masters of the work in all its details. Again he would ask, Who was the person who could write a specification? Not the careless man; not the man who was vague and did not know his own mind; not the man who, like Nebuchadnezzar in his dream, expected the builders to interpret what he could not himself describe; not the middle-headed man, for the sooner that gentlemen left the architectural profession the better for himself and for everybody else. Lord Bacon, amongst his many wise words, said "Reading maketh a full man; conversation, a ready man; writing, an exact man," which might be thus paraphrased to meet the special requirements of the architectural profession: "Reading makes the full man; sketching, the ready man; specification-writing and drawing, the exact man"; and an architect's work, if it was to be worth anything at all, must needs be exact. The essential elements of specification-writing, then, were:—knowledge, not only of theory, but of practice; method; conciseness; clearness of description; and thoroughness. Now, in that view of its requirements he would take up the second part of his subject and go through a specification. Time would not, of course, allow him to speak about every detail, and it would be wearisome rather than profitable if he were to attempt to do so. Minute detail was the subject for the class, and he would, therefore, so far as possible, confine his remarks to general principles and points of importance, and would take up the work of building in the regular order according to which it would ordinarily proceed from the foundation to the finish. It should always be remembered that a specification could never be properly written as a thing apart. Drawings and specification should advance together; and there was nothing more useful than for the architect to have his specification headings all prepared, and, as his drawings proceeded, to note for each trade what he found necessary to describe in writing. He might, if he preferred (and it was an exceedingly good practice), make his drawings themselves the vehicle for much of his description, and so lessen the bulk of his separate writing, but, nevertheless, this practice would not supersede the general notes, because some things must be described which could not be represented on drawings. Now, inasmuch as it was probable that for one man who might be called upon to erect a public building or any other large structure, fifty might be asked to design and build a house, he would base the remainder of his remarks on that probability, and as briefly as possible show what had to be done. He would take the case of a house in the country, on a moderate scale, because it would be pleasanter for them to go into the fields than to bother themselves with all the difficulties of town building, such as the rights of light, the district surveyor, the Metropolitan or local Boards, and all the other ills to which town architects were heirs. Not that such difficulties were to be shirked when it was necessary to meet them. The house he would suppose to be built of brick, and, in spite of "Queen Anne," it should have, for the sake of illustration, some stone-mullioned windows, and might also perhaps indulge in some of the fine Dutch brickwork now so fashionable. But let them not forget, as they proceeded, another of Lord Bacon's wise sayings,—one which ought to be printed up in every architect's office,—viz., "Houses are built to live in, not to look on." He would presume that the architect of the house had duly inspected the site before preparing his design (a matter which should never be neglected); that he had noted its requirements; made out all about water-supply, drainage, &c.; tested the nature of the sub-soil, &c.; learnt all that he required to know as to materials, carriage, &c.; and had settled where the garden was to be. Then would come the consideration of the *Excavator's Work*. This

was most important, for the excavator was the man who found out what the architect was going to build upon. But it should be remembered that the excavator might go too deep as well as not deep enough. On clay such as had to be built upon in the neighbourhood of London, it was necessary to provide a broad and deep foundation. It was very often a dreadful material to deal with, but there were cases in which it was the best possible friend the architect could have; for instance, it was sometimes found that a bed of clay overlaid an untold depth of silt, and if the excavator were allowed to remove that bed of clay he ruined the site, so far as regarded its capacity for building, or at any rate he entailed an enormous extra expense upon the building owner. Hence the work of the excavator should be carefully considered by the architect, and should not be dismissed in a summary manner, as was too often the case. Sometimes, the site of a building was covered to some depth with vegetable soil. The excavator was often directed by the specification to take a foot off the surface in such cases, but that was frequently not enough; because if any part of the soil over which a building was erected contained vegetable growth, dry rot would be liable to assert its destructive and insidious power. He seldom saw in specifications any provision for removing the ground excavated to such position outside the walls as to form terraces or other features of the garden. Forethought in regard to this matter would cause proper instructions to be given to the excavator as to the disposal of the earth excavated. Instead of specifying that it was to be wheeled so many "runs" from the house, the particular spot or spots should be specified. Of course, if the foundation were a bad one, the architect would have to specify concrete, but he should carefully consider the kind of concrete which it would be best to use, in view of the nature of the soil and the qualities of the materials available. Whenever they were building on clay, his advice was never to use anything but lime or Portland cement concrete. He need hardly add that if a well had to be provided it should be kept away from the drains, especially in sandy or gravelly soils. With regard to the work of the *Bricklayer*, it ought never to be forgotten that brickwork should vary in its mode of execution according to the season. Consequently a specification for brickwork to be executed in the summer should differ in its wording to one for brickwork to be done in the winter. For instance, it would be dangerous to use the same quantity of water in building walls in winter as in summer. In summer a great deal of water might be used,—the more the better, and the wetter the season the better. Walls should also be thoroughly grouted in the summer, but during four or five months of the winter not a drop of grouting should be used. A damp-proof course should, of course, be provided, and if it was desired to secure basements which should be of value, because dry, for storage purposes, a vertical damp-proof course should be provided to any height required, in addition to the usual horizontal damp-proof course. Such vertical damp-proof course might be made in the following way: The walls, above the horizontal damp-proof course above the footings, should be built hollow, say with a 1½ in. or 2 in. cavity, but not bonded together by ties of any kind. The cavity should be completely filled in, as the work proceeded, with boiling asphalt, which when cold and hard would hold so tenaciously to the brickwork as to form, with the outer and inner brickwork, a solid wall. Where necessary, this vertical damp-proof course should be carried up all through the basement-wall to the underside of a second horizontal damp-proof course placed just above the ground level to protect the floor on that story. A great deal was said in specifications about the quality of bricks, but why not shorten the expression now used by having a clause to the following effect:—"For walls, hard, sound, well-burnt bricks are to be used, and no others shall be suffered to come upon the ground"? The specification should, of course, be very clear as to the mortar and its ingredients. In country places, where river sand was not always easily procurable, pit sand was used, and sometimes road-drift, which, when collected from flint roads, made very good mortar, but it should be collected as long as possible before use, in order that the filth contained in it might be thoroughly washed out. He was a great advocate for the use of hollow

which they ensured, but they required to be built with very great care. He sometimes saw hollow walls so drawn as that, while the central portions of the walls were hollow, at the window openings and at the quoins they were solid. Through these strips the wet would drive, and the walls would always be damp there. Some people recommended that hollow walls should be built of 4½ in. work outside and 9 in. work inside, and theoretically they were right, because practical requirements, such as strength to bear the superincumbent floors and the roof, made it desirable to have the thicker walls inside; but in such walls the use of anything in the shape of iron ties could not be too strongly deprecated. Iron ties so used speedily decayed by rust, and then the whole structure on which they depended became as rotten as a pear. The best thing in the way of hollow walls was a double thickness of 9 in. work, with a 3 in. cavity between, the walls being bonded at short intervals with continuous courses of brick impervious to moisture. A wall, 1 ft. 9 in. thick, built in this way, combined the advantages of a solid wall with those of a hollow one. Such a wall was the driest and best that could be built, and it had another advantage of no small importance. Having to build a large house in the country, in which all the external walls were to be constructed in this manner, it so happened that he could not get the external stonework in time. He, therefore, determined to build the inner parts of the external walls first, in cement, with the bonding courses projecting out all the way up. By this means he had got the roof on, the floor joists laid, and could get the internal work generally well forward, and he was going at his leisure, when the stone was ready, to build the outside parts of the external wall. Thus time would be saved, and his client would be able to enter upon a perfectly dry house as soon as the work was finished. In smaller hollow walls, obtained by 9-in. and 4½-in. thicknesses, iron bond must be used, but it would do merely to specify, as was too often done, that the hollow walls were "to be properly bonded by iron." Such a stipulation would lead the builder to say, "Oh, hoop-iron will do for them." But it would not do. The specification should state how many pieces of bond were required, their dimensions, distance apart, &c. This point was one of many which illustrated the extreme importance of architects making the descriptions in their specifications in every respect absolutely accurate. It was only fair to the builder that he should be told before he began his work what he was expected to do. If an architect desired to go upon the modern principle of ventilating the space under floors, with the view of preventing dry-rot, such ventilation should be thorough. It was often specified that air-bricks should be inserted in the walls beneath the floor, but perhaps only six were named for a whole house. To place one of these small openings here and there was absurd, for, however disposed, they were so few in number that they must leave a considerable area of the under side of the joists and boards in corners and recesses unventilated, and therefore liable to attacks of dry-rot. Dry-rot was a foe to the architect and builder which could not be too strictly guarded against. In sleeper walls there were generally a great many bricks wasted. They could be built pigeon-hole fashion with equal strength, and if so constructed would permit of the freer circulation of air beneath floors. He advised his hearers not to put impracticable clauses in their specifications, such as "Every brick used is to be a whole brick." When he saw that clause he was quite sure that it was written by a young man. While, in foundations, such a clause might fairly be insisted on, for the walls above ground there must be used what bricklayers termed "closers." There was no necessity to have so many solid bricks if the bond were good. Another clause often seen in specifications was to the effect that "every fourth course is to be grouted." Why only every fourth course? If bricks were properly bedded, such a clause must needs be absurd. The new fashionable brick facing-work, very finely and smoothly jointed in putty, might be pretty, but it was hardly brickwork, for unless the backing were to be set in Portland cement it could not be made sound. Mortar could not be used for the joints, because if of sufficient thickness there would be unequal settlement. The best brickwork that could be seen anywhere in the world was that of the Romans, which was



characterised by good thick joints of honest sort of stuff in the shape of mortar that was not afraid of coming to the surface. The brickwork introduced by Dutch William was not brick-work at all; it was toy-work, and inconsistent with sound building. He was supposing that the house which he was taking as an illustration was built in the summer, and therefore that all the joints were finished as the work proceeded, so that there was none of that horrid after-smearing with black pointing which was so much to be condemned. The proper building of the flues and chimneys was an important point, practically and artistically. He thought that any architect who so ill-designed his chimneys that they needed the aid of "tailboys," cowl, and other monstrosities to enable them to do their work, was a discredited to his profession. It was perfectly easy to build them so as to carry off the smoke perfectly. In a house of any size, while the architect was planning his chimneys, he should not forget to provide a spare flue or two. If they were not used as chimneys, they would often be found very useful as ventilating shafts to carry off heated air. Speaking of chimneys, on the outside of the roof they should always be provided with a damp-proof course worked in just above the tiles. Being only of 4-in. work, unless protected in this way the water would soak down and damage the ceilings and walls of the upper rooms. Between the months of October and March chimneys above the roof should always be built in cement. The subject of Drainage was often dismissed in a sentence or two in a specification, but the drainage works of a building should be described with the greatest possible particularity, and their execution looked after with the same degree of care. One very important clause which it was desirable and necessary to insert in a specification would commend itself to all who knew the extent to which each individual tradesman employed on a building felt himself at liberty to destroy or injure the work that had been done by others. It was to the effect that the contractor should suffer nothing to be done to the neglect or injury of the appearance or stability of any brickwork or other work, and that he should allow no damage to accrue to the job through the inadvertence or carelessness of other tradesmen. With regard to the work of the Mason, it was a common clause in specifications that the stonework was to be tied together with iron cramps and dowels everywhere. The first question that had to be answered before such a clause was written was, Were the dowels and cramps necessary? In his opinion, they were not. Indeed, he was firmly convinced that more often than not they were absolutely injurious to the work. He had seen a good deal of old masonry, and had seen very few iron cramps except where the work had failed in consequence of their use. Masonry might be joggle-jointed securely with sharp pebbles, but the use of so perishable a material as iron for cramps was highly objectionable, for owing to swelling caused by the oxidation of the metal it burst the stonework, as was to be seen in classical churches and other buildings. With regard to the work of the Carpenter, a good rule to remember was never to put a piece of timber into the walls which could be kept out of them. Very frequently, he was sorry to say, he had drawings sent to him in which the ends of joists were built into the walls close to the ground-line. It was a capital plan, when building in very exposed positions, and where stone was available, to use a good corbel-course, formed of stones going right through the walls of the outer face, but forming a projecting ledge inside, on which the floor-plates could be placed. Such a corbel-course, when used to carry the plates of the upper floors, could be made to form a good architectural feature in the shape of a cornice to the room below. In regard to roofs, it was frequently specified that the gutters were to be laid "with all necessary falls and drips." It would be just as easy to specify the exact extent of fall and drip required, and yet architects of large buildings were content to use such a vague clause as the one just mentioned. With regard to roof coverings, he agreed with what had been said at the previous meeting as to the superior warmth and comfort of tiles. The roofs of houses, and of churches more particularly, were but too often inadequate to properly protect the buildings which they covered from the extremes of hot and cold. People, when they were building a church, with its substantial

walls and solid piers, never thought of adequately covering the building, but frequently put a thin roof of slate or tiles, boarded on the under side, over it. It was futile to expect to warm a building so roofed. He was a strong advocate for hollow roofs, i.e., roofs in which a space or spaces could be left between the outer and inner surfaces. A great deal could be done in this way in a very small space. If the space between the outside of the roof and the ceiling or interior surface could be divided laterally so as to form two or three air-spaces, so much the better. For such internal division a thatch made of straw, or, preferably, of Norfolk reeds, could be used, and nothing could exceed the warmth and comfort of such roofs. Tiles were greatly to be preferred to slates for covering, not only on account of their superior warmth, but because if one got broken or displaced another could be slipped in easily, but to replace a broken slate it was necessary very often to strip off a large number, which was an expensive process, owing to the liability of breakage of old slates at the nail-holes. When the architect was specifying his *Joiners' Work*, he should mentally go into every room of his building and see what its requirements were, utilising every nook and cranny to the best advantage. It was a very important matter to have all joinery and woodwork prepared in advance, and of well-seasoned wood. There was one point in connexion with this to which architects did not give sufficient attention, and that was as to the proper time to put the joinery work into a building. It was very destructive to put well-seasoned joinery into a building the brickwork and plaster of which was reeking with moisture, for, however well-seasoned the wood used under such circumstances might be, it would inevitably absorb some of the moisture and swell, and then, when the building got dry, would shrink and gape at the joints. Builders, owing to this, were often unjustly blamed for using unseasoned timber, but the real cause of its shrinkage was undue haste and disregard of season in building. Good building could not be done hurriedly and without regard to season. The man who wanted a house well built should get his brickwork up and the roof on by the end of October. The building should then be left to stand in carcass fully exposed to draughts until March or the beginning of April, when the plaster should come in, and after his work was dry the joinery could be put in and the house be properly finished and dry and fit to live in by August or September. It was a common stipulation in specifications that all wood was "to be clear of sap," but this was not always strictly interpreted to mean what it said, and he had found it desirable in his specifications to add a note or memorandum to the following effect:—"It is to be clearly understood that this clause means what is expressed therein, in a sense rigidly exact, and that all sapwood is to be cut out in whatever form it may appear." With regard to floors, he never returned from a journey on the Continent without being disgusted with the floors to be found at home. It was an extremely rare thing to find a decent floor in England nowadays, but on the continent and on the other side of the Atlantic such a thing as a bad floor was rarely seen. People in England had been spoiled by the rage for building houses cheaply, and they had in consequence to be content with floors which they were obliged to cover up with carpets. The Americans knew what good joinery was, and all the floors of their good houses were laid upon the following principle:—They covered the joists with ordinary boards as a foundation, and over these they put a superior floor covering, not necessarily parquetry, but of well-prepared boards, without a particle of sap, and without a single nail being visible. For the first twelve months they were simply tacked, as it was termed, to the boards beneath them, and were afterwards nailed down through the edges, so that the heads of the nails did not appear on the surface. We could not show such floors, unless we used parquetry. He understood that the late Thomas Cubitt used the method of flooring just referred to. One very important point that should never be neglected in regard to ground floors was to see that every particle of wood-shavings and sawdust was removed from the surface of the ground, for where the ground was damp or likely to become so, shavings and sawdust would afford a roasting-place for dry-rot, which would grow and spread over the whole of the joists and the underside of the boards. With regard to *Plumbers' Work*, many important public and other buildings had a great deal of money expended

upon them for ornamentation in the shape of moulded and carved work, while at the same time cast-iron eaves gutters, rain-water heads, and down-pipes were used. Iron used for such purposes would not last half a century, even though continually painted. Wherever possible, lead should be used instead of iron. It was capable of very artistic treatment, as could be seen in many old examples, and it was undoubtedly correct principle that utilitarian features such as he had mentioned should be made ornamental. After passing in review the work of the painter, glazier, and other tradesmen, and the way in which it should be specified to be done,—instancing, *inter alia*, the way in which workmen not only in these trades but in other trades would sometimes play tricks in order to bring discredit upon the clerk of works or foreman.—Mr. Christian concluded his address by urging upon young architects the importance of giving time when they were young to, so as to enable them to write or dictate the terms of their own specifications. Unless they mastered these details when they were young they would be bunglers all through their career. He strongly advised young architects who were qualified to act as clerks of works to give two or three years of their early career in superintending, in detail, the erection of buildings, and ridiculed a young man who, while he thought he should like to do that kind of work, "did not want to do anything unbecoming a gentleman," explaining, on being questioned, that he meant he "should not like to do anything in which he could not wear gloves." (l)

Mr. Christian's address, which was interspersed with several amusing personal reminiscences, and which made allusion to a great many points of detail which want of space precludes us from noticing, was not concluded until an unusually late hour (for the Association), and there was only time for a very brief discussion, in the course of which Mr. Pink moved a vote of thanks to Mr. Christian, and this being duly seconded and carried, the meeting terminated.

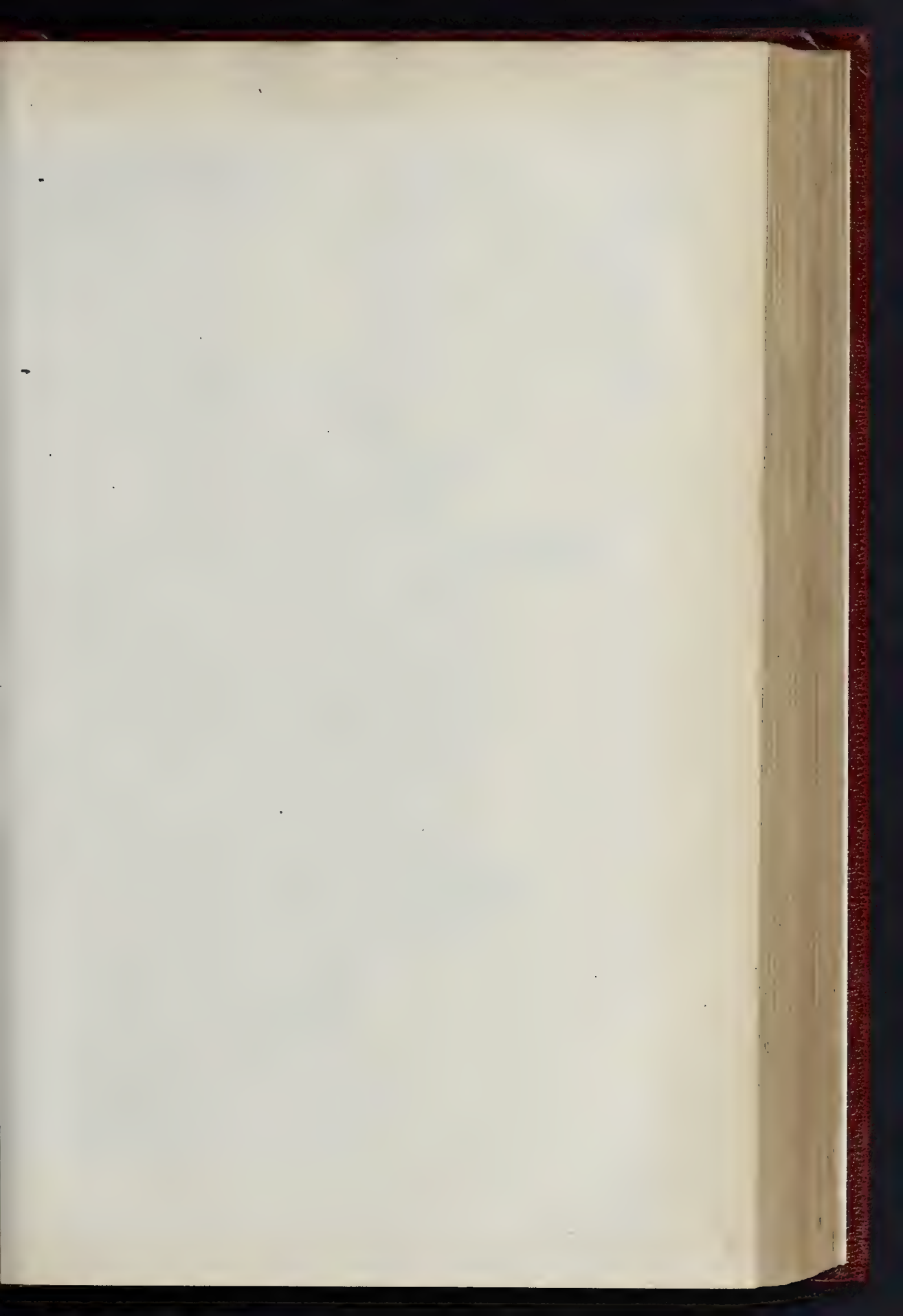
#### SOCIETY OF ENGINEERS.

The first ordinary meeting of the Society of Engineers for the present year was held on Monday, the 6th inst., in the Society's Hall, Victoria-street, Westminster. The premiums having been presented, Mr. Jabez Church, M. Inst. C.E., the newly-elected president for 1882, delivered an inaugural address. He especially touched upon those branches of the profession with which his own practice is more immediately connected, viz., sanitary engineering, and gas and water supply. With regard to sanitation, he remarked that that subject was in the past a matter which was considered to be more or less beneath the dignity of the civil engineer, and utterly unworthy of the consideration of the general public; but in these days it is found a distinct branch of engineering science, and the public took a keen interest in sanitary matters. Mr. Church referred to the pollution of the Thames at the sewage outfalls, and expressed his opinion that before long some steps must be taken to improve the sanitary condition at this part of the river. With regard to the London water-supply, he thought the sooner the Government took the matter in hand the better, as the value of the companies' property was steadily on the increase.

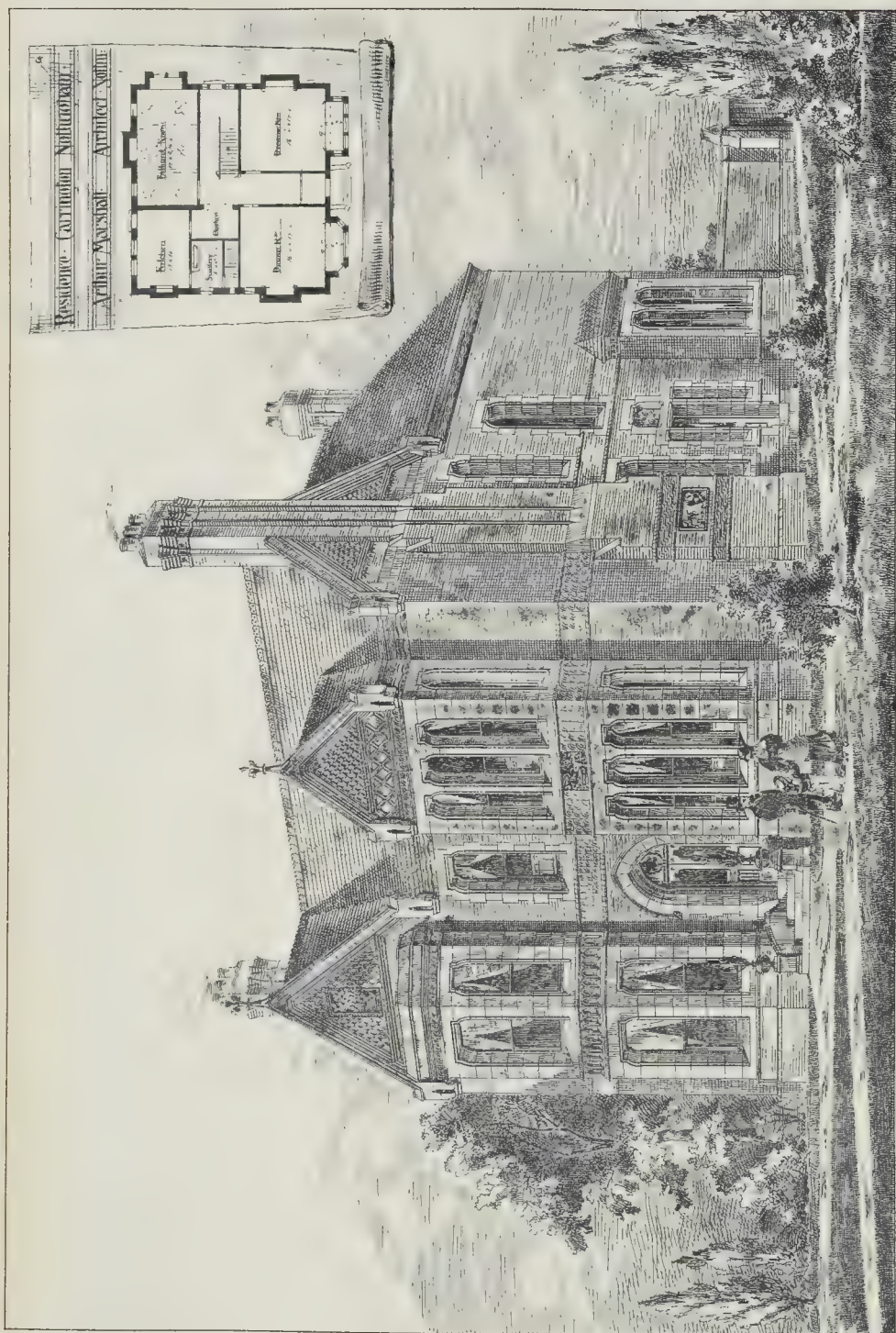
At St. Alban's Abbey, a few minutes before the commencement of afternoon service on Sunday, the 1½-ton weight of new chimnes fell a distance of 24 ft., on to the lower ceiling. The ceiling was not pierced by the weight, but one of the painted panels was splintered, and several pieces of wood fell into the body of the church. One person received injury to the skull, and another an injury to the arm. In consequence of the accident, neither an afternoon nor evening service was held. The new chimnes were erected only last summer. They fell owing to the wire attached to the weight giving way on Sunday.

\* A few flagrant instances cited by Mr. Christian were that of a few bricklayers, who in order to spite the clerk of works (who had been very particular about the construction of a flue in a lofty tower), surreptitiously returned to work for an hour or two after all the other workmen had left, and built in, right across the flue, a stone landing, the trick not being discovered until the building was completed. It is satisfactory to know that, as Mr. Christian observed, all British workmen are not of this type.

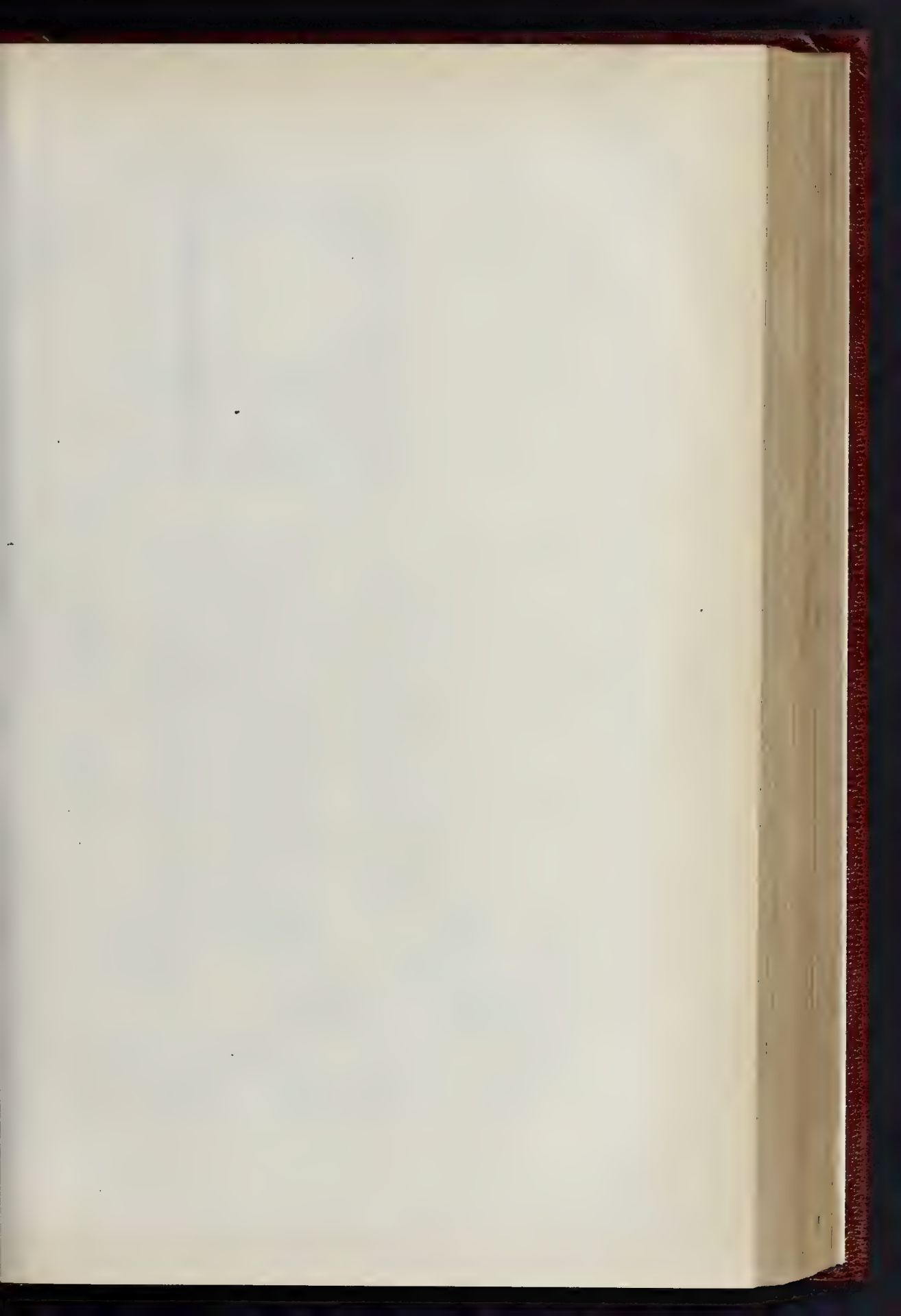




THE BUILDER, FEB. 11, 1882.



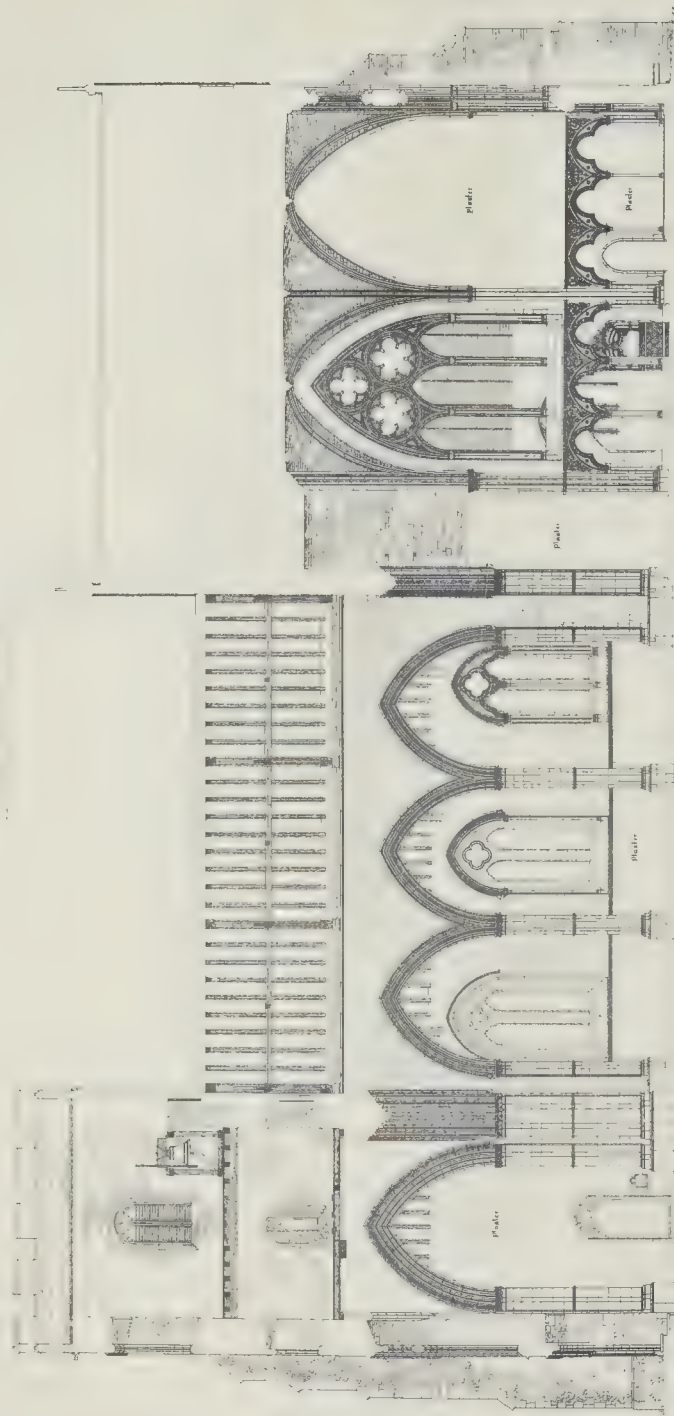




THE BUILDER, FEB. 11, 1882.

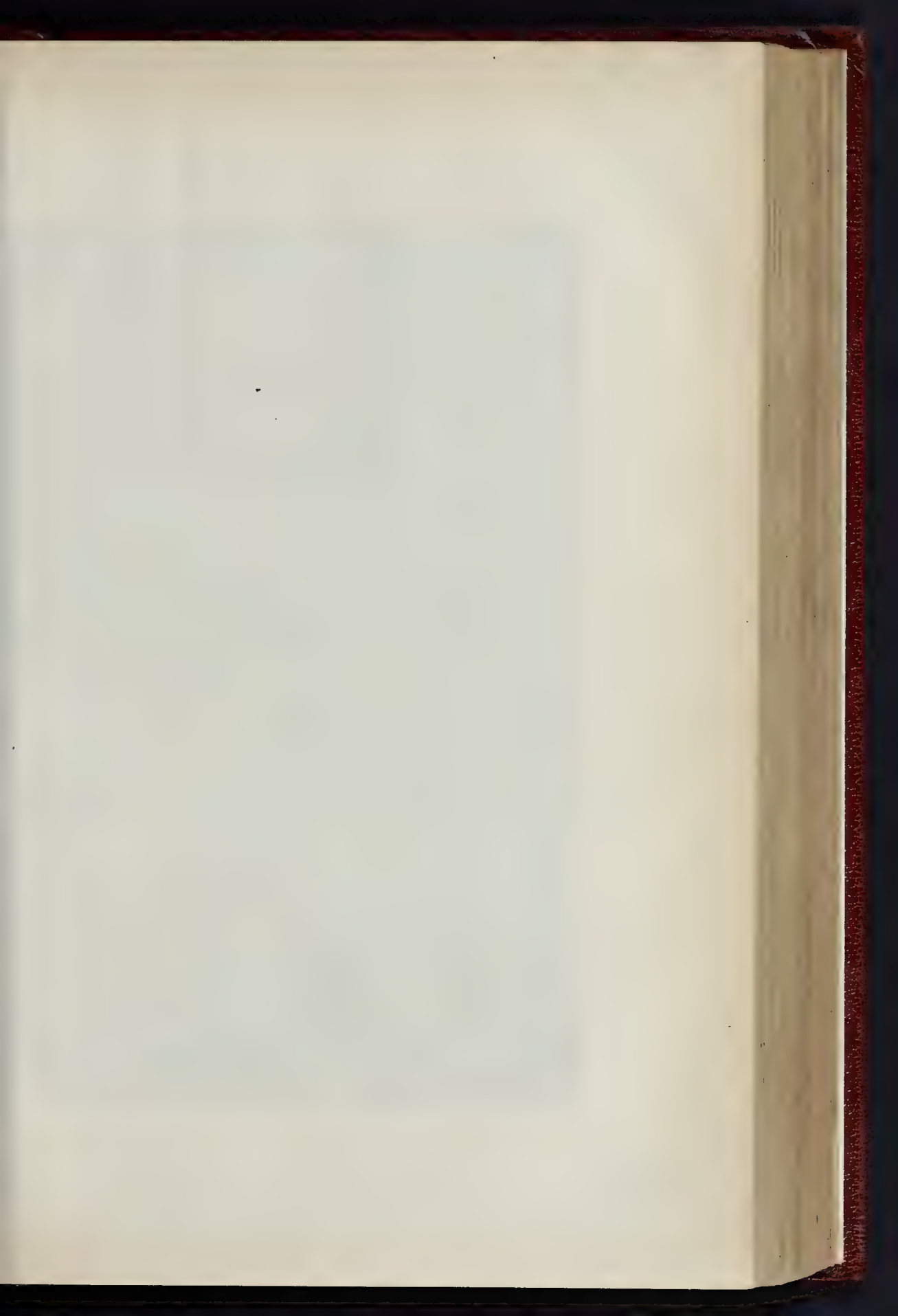
# CHURCH OF ST. MARK, STONE KENNEL

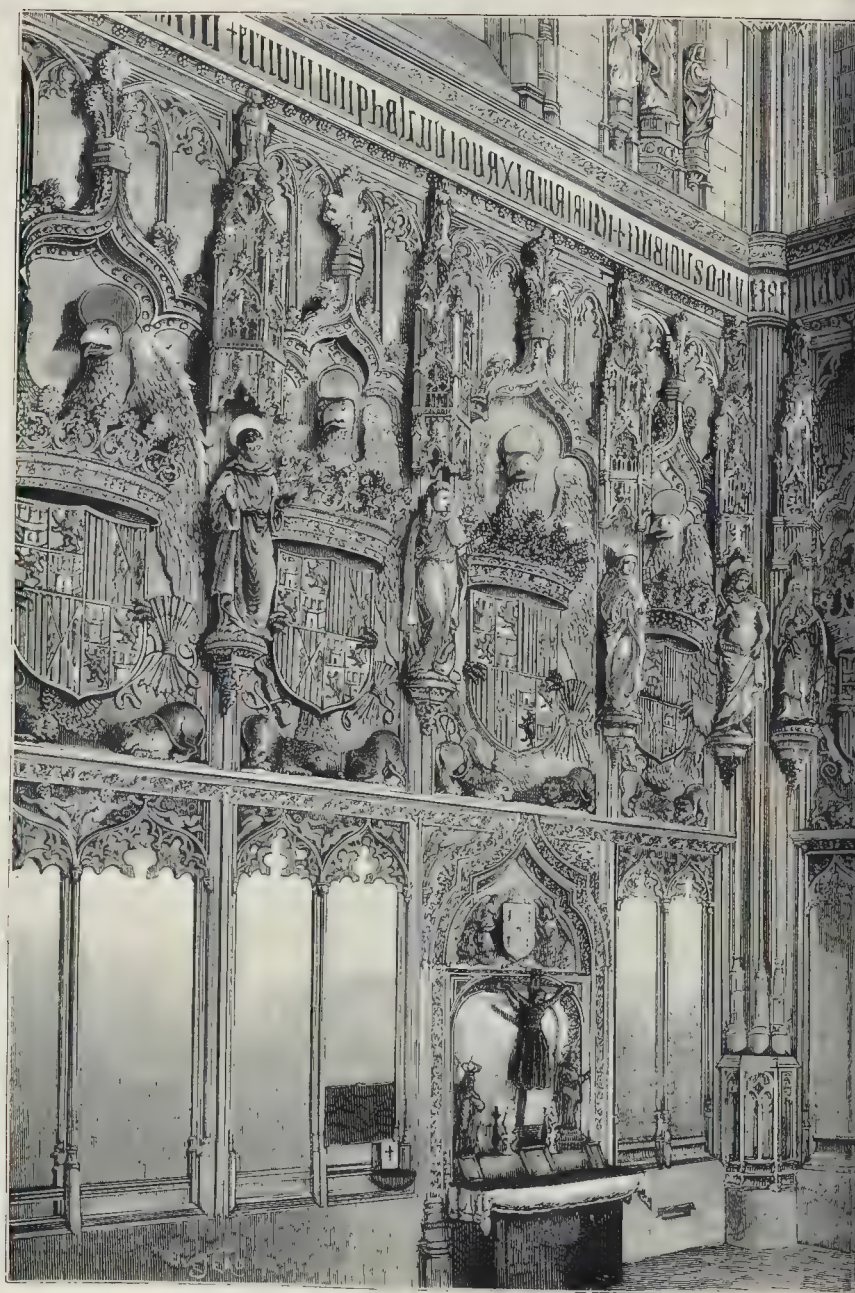
LONGER END WALL, SOUTH SIDE



SCALE OF FEET







THE INTERIOR OF THE CHURCH



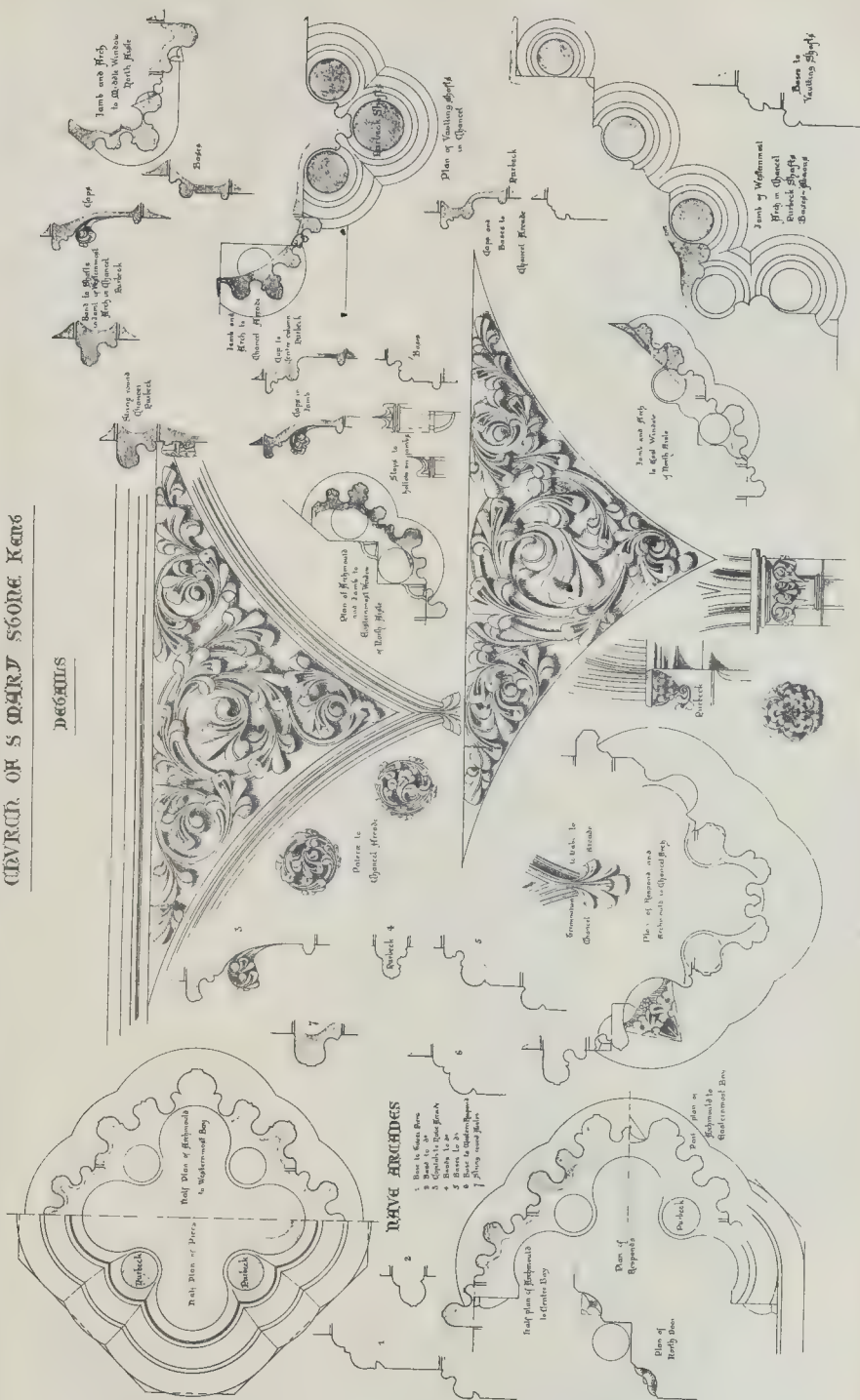


JUAN DE LOS REYES, TOLEDO.





## STUDY 9B.D.



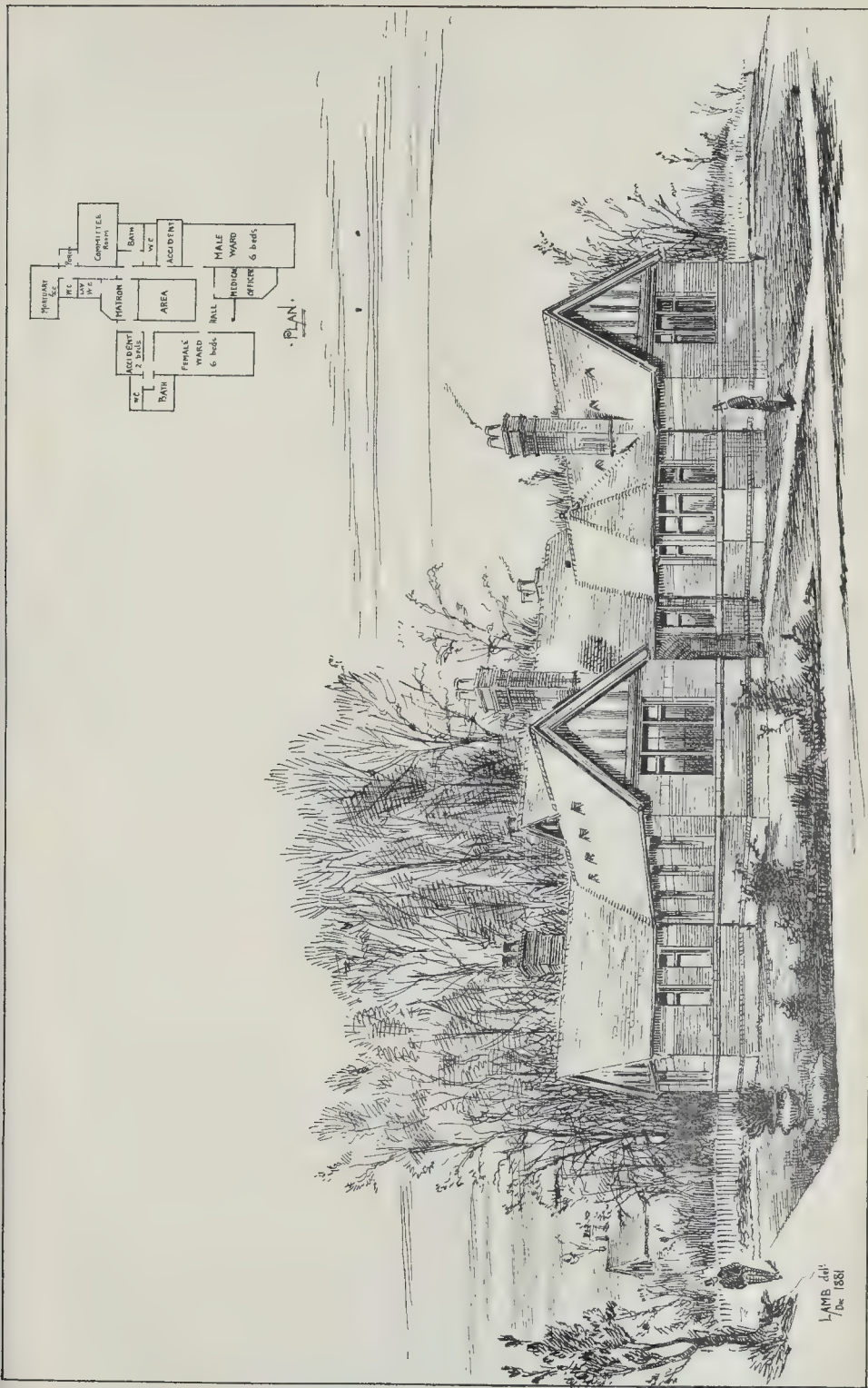
ROYAL ACADEMY S.\_VER MEDAL AWARDED 1881

# THEORY

Wm & J. Sons Printers Gt Queen St







Whitman & Sons, Photo Litho 238 High Holborn

COTTAGE HOSPITAL, NEAR WHITEBY.—MR. THOS. MILLER, ARCHITECT.

Whitman & Sons, Photo Litho 238 High Holborn





# INTERIOR OF THE CHURCH OF SAN JUAN DE LOS REYES, TOLEDO.

THE Church of San Juan de los Reyes, on account of its architectural characteristics, is looked upon as the most interesting edifice devoted to public worship in the imperial city of Toledo, next to its magnificent cathedral. It forms an annexe to the monastery of the same name, and was erected during the reign and by order of the Catholic kings, who presented it to the community of Franciscan friars,—end of the fifteenth century. The interior of the church (of which we give a view in our present number), as well as its sumptuous portal, designed by Covarrubias and completed in 1610, is a good example of the styles which prevailed in Spain at those periods. The Church of San Jerónimo del Prado, which still exists in Madrid, although in a ruinous state, offers in its architectural lines many related features to the Toledo edifice. The cloisters of the convent are mentioned as marvels of art; unfortunately they were totally destroyed by fire in 1803. Serving as a record of the times in which it was erected, the façade of the church is adorned by a number of chains, which were carried by Christian captives in Granada, afterwards liberated.

## NEW HOUSE, CARRINGTON, NOTTINGHAM.

THIS house has recently been erected in Pelham-road, Carrington, near Nottingham. The ground-plan is illustrated. There is an extensive basement story, with wine, coal, beer, and store cellars, larder, &c. The upper floor has a bath-room, water-closet, box-room, besides a number of bed-rooms. The wash-house, servants' water-closet, dust and ashes pits, &c., are in a yard at the rear. The materials used are copper-mould bricks from Loughborough for the face work. The terra-cotta was manufactured by James Brown & Co., of London. The stone-dressings are entirely of Red Corsehill stone. Whitland Abbey green slates are used for the covering of the roof. The billiard-room and bed-room fire-places are in American walnut, and the best doors and staircase are in pitch pine and walnut. The total cost is about 1,800l.

The works have been done by Messrs. Bell & Son, contractors, under the direct supervision of the architect, Mr. A. Marshall, Nottingham.

## THE CHURCH OF ST. MARY, STONE, KENT.

STONE, Stantune, or Stanes, as it was anciently called, is a small village on the south bank of the Thames, about half a mile from Greenhithe, and three miles from Dartford.

The church, which is well known as a beautiful specimen of thirteenth-century work, at present consists of a chancel, with a chantry and vestry on the north side; a nave, with western tower; and north and south aisles prolonged to the western face of the tower. It was restored about twenty years ago by the late highly esteemed professor at the Royal Academy, Mr. Street; and at that time he published a full and interesting account of the church, from which it appears certain that the work dates from the time of Lawrence of St. Martin, bishop of Rochester from 1251 to 1274, who possessed a residence and estate of some value at Stone.

It was during the time of Lawrence of St. Martin's episcopate that the chief portion of Westminster Abbey was built, and the evidence of similarity between the work at Stone and Westminster is so marked that it may safely be conjectured that the same hands were employed in both places. Mr. Street, in his description of the church, says,—“For a village church its character is unusually sumptuous and ornate, and perhaps there is no example of any First Pointed building in England in which the grace and delicacy which characterise the style have been carried to greater perfection. It is impossible to speak too highly of the workmanship or of the design of every part, and close as is its similarity in many points to our glorious Abbey at Westminster, it is a remarkable fact that, in care and beauty of workmanship, the little village church is undoubtedly superior to the minster.”

The early church appears to have consisted of a chancel and nave, with north and south aisles and possibly a western tower. The lower part

of the present western tower and the prolongation of the aisles are not, I believe, earlier than the middle of the fourteenth century, though in the western bay on the north side there is a good Early doorway which probably was the original west doorway of the church.

The vestry on the north side of the chancel was added in the fourteenth century, and in the sixteenth the Wilsyre chantry was added in the space between the vestry and east end of the north aisle.

The upper part of the tower is very poor and of a later date; probably it was rebuilt after the fire, which Hasted says occurred on the 14th day of January, 1633, caused by lightning, when “the roof and steeple were burnt.”

The exterior of the church is exceedingly simple, the windows of the aisle having only chamfers and a label over them; the buttresses, too, are very plain, all the richness of detail being reserved for the interior; and a most remarkable feature in the design of the interior is the way in which the whole of the work gradually increases in richness of detail and beauty from the west to the east.

In the western bay the arches of the arcade are only moulded, and the windows of the aisles are simply coupled lancets, with a quatrefoil above, and a chamfered internal arch and label, without any carving.

In the middle bay the arches are moulded, but more richly than the last, and the windows of the same shape; but the internal arches and quatrefoils are moulded, and the internal jambs are finished with a stone shaft, with moulded base and carved capital, and the label is enriched with “dog teeth,” and is terminated with carved heads.

In the eastern bay the arches are richly moulded, and the centre of the soffit has a large dog-tooth enrichment, making it much more ornate than the other arches. The windows are the same as before, except that the quatrefoil is not moulded, and instead of an ordinary internal arch, the windows in this bay have richly-moulded tracery on the inner face of the wall, standing clear of the window proper, though correspondingly of two lights, with a quatrefoil over (see longitudinal section). The jambs have each two shafts, one marble and one stone, and the centre is supported by a detached marble shaft. The capitals to the shafts in the jambs are carved, and there are carved bosses in the spandrels of the south window.

The east window of the south aisle is of two lights only, with two marble shafts in each jamb, and an engaged stone shaft to the mullion. The east window of the north aisle is richer than any other in the body of the church. It is of four lights, very delicately moulded, and the large circle has a dog-tooth enrichment (see cross section, which, together with plan of the church, we shall give on another occasion).

Externally these last two windows are quite plain, but they show a curious freak at the springing, where the outer chamfer of the jamb is gathered in by a curved shoulder. The chancel-arch is more richly moulded on the west side than any of the other arches, and has a beautiful ornament, in shape like a large dog-tooth, but carved into elaborate foliage.

We come now to the chancel. This, as will be seen by reference to the plan, consists of a small western bay, 7 ft. 6 in. long, and then two larger bays, wider than the nave, and with quadripartite vaulting, which at once gives much greater dignity to this part of the church.

The first bay is quite plain, without window or arading; but the other bays have at the base three divisions in each of wall arading on marble shafts, with trefoil arches, richly moulded, and with most delicate and beautiful carving in the spandrels, varied in design (two of these spandrels are shown on the sheet of details). The east wall has four divisions of similar arading. This arading is very similar to the arading in Westminster Abbey. The magnificent window in the north wall was discovered at the time of the restoration, and restored in accordance with the old design. It is of three uncoupled lights, with tracery composed of three cusped circles. The opening is let into a groove, and a sufficient number of fragments were found to show the exact form of the original. Internally the arch and tracery mouldings are very delicate, whilst externally they consist of bold chamfers and hollows. On the exterior the jamb has two engaged shafts, and internally two detached marble shafts, and is very elaborately moulded.

The east window was inserted by Mr. Street, and the south window is a copy of the one on the north.

Before the restoration the groining had been destroyed, but marks of it remained against the walls, and numerous fragments of the ribs were found, so that it could be faithfully restored. In the south wall of the chancel is the old piscina under one of the divisions of the arading.

The very peculiar plan of the chancel will, of course, at once be noted, and the only solution of it seems to be that the chancel was originally intended to have been the width of the small western bay and some 35 ft. in length, that before much had been built, grander ideas prevailed, and that all excepting the 7 ft. 6 in. in length, was removed and the two large bays substituted.

The work of these two bays is so out of scale with the nave and aisles that it does not seem probable that they were originally intended, while at the same time the detail clearly shows that there could have been no great interval between the date of the erection of the nave and the chancel. The low level of the chancel floor is also singular, and it is quite clear the altar could not originally have been placed close to the east wall, as the arading is quite perfect at the east end. In the chancel floor there is a fine fourteenth-century brass cross.

On the wall of the south aisle immediately under the string there are remains of a painted running pattern of early character, and on the north aisle wall between the first and second windows there has been painted a large sitting figure of the Virgin nursing Our Lord. She is seated on a throne with shafts at the angles and a gabled trefoil canopy with pinnacles on either side; on the same wall east of the easternmost window the same subject is represented, and between this window and the centre one there are traces of a painted subject, but it is so damaged that it is impossible to tell what it represented.

In the north wall of the Wilsyre chantry there is a very elaborate founder's tomb under a panelled arch (it is shown in the long section). Weaver says, “This knight [Sir John Wilsyre] is entombed in a faire chappell of his owne foundation; he was controller of the towne and marches of Calais, ann. 21 Hen. VII., 1506.”

W. B. S.

## COTTAGE HOSPITAL NEAR WHITBY.

THIS building will accommodate sixteen persons, including four beds for accidents. The materials are red stocks and York stone. The wards inside will be lined with a glazed tile dado 5 ft. high. The cost will be about 2,400l. Mr. Thos. Miller is the architect.

The sketch plan annexed shows the arrangement of the various apartments.

## A REAL EGYPTIAN GRIEVANCE.

OUR readers will doubtless recall the announcement recently made, to the effect that a new pyramid, the pyramid of Mejdum, had been, within a few weeks, explored by the archaeologists; the news, arriving within but a short time of the almost “sensational” discovery of what we have come to know as the “Royal Mummies,” aroused a fresh general interest in the Egypt of the past,—at a moment, too, when the Egypt of the present is largely engrossing public attention. This is the season, also, it must be remembered, when those fortunate enough to escape our winter are flocking to the mild climate and the novel excitement to be found in a now easy journey to a country once only visited by the most adventurous explorers, or the ardent amateur matriculating for certain admission to the Travellers' Club.

News reaches us that the discovery of the entry to the pyramid of Mejdum, from which such great results were expected, has proved deceptive. M. Charnes, the Oriental correspondent of the *Journal des Débats*, contributed to that paper on February 3rd a letter from Luxor, in which he relates how the hopes raised by the opening of the pyramid, founded on the expectation that the passage had never been entered since the day it was built, have not been realised. In the passage, as in the chamber to which it led, not an inscription remains,—all have been destroyed. A doubt is expressed as to whether the chamber discovered be really the principal, it being possible that, as in the case of the Great Pyramid, there are several chambers; the excavations will, therefore,



be continued. The results obtained are, however, of some value; the pyramid is proved not to be, as asserted, false, as, except its exterior, it resembles in construction all the other pyramids. But this one question solved, another has been substituted.

The excoavation of the Pyramid of Meydom is part of a scheme which M. Maspéro (the successor of the late lamented Mariette-Bey) has now set well on foot,—the study, one by one, of all the existing pyramids, to determine those which are able to supply any important information. They all contain a vast number of inscriptions, and the task of deciphering these is no light one; yet, long as it must be before the Egyptologists are in possession of this mass of facts, till then no exact idea can be formed of the manner in which the subject of death was regarded by the ancient Egyptians.

In another direction it would appear that M. Maspéro is doing good work. At Luxor he is making preparations to lay bare the temple which has so often been painted and photographed. Regarded as one of the most beautiful and curious of the monuments of ancient Egypt, most of which are of the Ptolemaic period, this being of the eighteenth dynasty, approximately that is, about 1700-1500 B.C., it has long been half buried beneath a wretched modern village built in the magnificent colonnade. With proper permission, the village, composed of shanties, would be the easiest thing in the world to remove; the promise of a new hut on a piece of ground at a short distance, together with a small indemnity, would, it appears, satisfy the poor Arabs. The correspondent of the *Éclair* alone foresees a slight difficulty in the removal of the houses of the French and English consular agents. As to the action of his own countrymen he entertains no doubt; he only fears Mustapha Aga, our agent out there, whom he would appear somewhat to mistrust, though he expresses his firm belief that England in such a case would willingly assist a good cause, especially as so many English tourists visit the spot.

The tourists increase in numbers every year; reports of revolution, insubordination in the army, and cholera are powerless to hinder them, and the easy means of communication, the steamers which now run so frequently up and down the Nile, bring, in larger numbers than ever, the strangers to see the ruins. Their presence, however, is, we are sorry to hear, deeply regretted by the genuine archaeologist. In the thirty years that Egypt has been thus visited, more harm has been done to its old buildings than in the centuries of so much abused neglect which have passed over the country. The destruction caused by the tourists is really serious; piece by piece the inscriptions and the wall-paintings are being chipped away to supply "mementos." M. Charnes describes how, on visiting a few days previously the Valley of the Kings, he found most barbarously mutilated the famous tomb of Seti I., which was discovered by Belzoni; the alabaster sarcophagus is, it will be remembered, at present in Sir John Soane's Museum. When Belzoni and Champollion entered the tomb it was intact; not a word of the inscribed text was wanting; the wall-paintings were as fresh in colour as if painted the day before: now the tomb is nearly a ruin, and in a few years the destruction will be complete. It was in vain that an official was placed on guard, his action was invariably complained of by the visitors as insolent,—which, of course, it may have been; other monuments, which were closed for their protection have been forced open by the strangers. It appears, indeed, impossible to prevent the injury done to the monuments by the numerous tourists, injury twenty times as destructive within a few years as in the centuries of the alleged barbarism of Kopts and Arabs. Not as a remedy, but as a measure of precaution, it would be advisable to have the more important inscriptions copied. It must be remembered that there is a vast amount of repetition, unnecessary to notice. Here, as the correspondent of the *Débats* wisely suggests, is a work for the newly-appointed French "École d'Archéologie" at Cairo. Egypt has been revealed to us barely a century, its tongue is as yet scarcely familiar to us; to attain this end there remain literally hundreds of miles of inscriptions to decipher; the work is not a small one, but it is progressing. England, France, Germany, and Italy are tolling hard together. M. Charnes is perhaps too modest when he speaks of the backward position of his

country in this direction. What publications, he asks, have we to compare with those of the British Museum and the great work of Lepsius? though he is right when he remarks that Germany is supplied with chairs of Egyptology in most of its universities. England also in this respect may be said to be somewhat behind Germany.

Whatever may be said by the sceptics and the indifferent, Oriental archaeology has become in the present day the foremost of historic sciences. Without an acquaintance with it, it is impossible to understand the art, the literature, the manners, the religion, and the history of Classic antiquity. The discoveries of our century have shown that this antiquity was derived from Egypt, with the civilisation of which it was as closely connected as is ours with that of Greece and Rome. A series of exceptional circumstances has preserved for us the relics of this distant civilisation; our gratitude is due to those alike who pursue and who encourage a study which will place us in possession of the invaluable information which research cannot fail in time to elucidate.

#### THE CARRIAGE OF BUILDING MATERIALS, AND THE WOLVERHAMPTON CHAMBER OF COMMERCE.

A MOVEMENT has been initiated by the Wolverhampton Chamber of Commerce, which has unusual claims on the sympathy and attention of our readers. As far as regards the command of the architect over the most suitable materials for his designs, and the provision by the builder of such materials, not only at the cheapest rates, but at prices on which he can safely calculate far in advance of his work, the inquiry has a special claim on our pages. But the particular interest of any trade, however direct, and of whatever magnitude, sinks into insignificance by the side of one or two questions of national welfare to which we wish, as briefly as is consistent with clearness of statement, to call attention. And, in addition to the interest we may take in the matter, first as regards the trades specially connected with building; and, secondly, as regards the general industrial development of the country; we must be allowed a special tenderness in behalf of an inquiry as to which we have long been among the small minority of public journalists who have insisted on the necessity and importance.

The subject in question takes the form, in the first instance, of an inquiry into the relative cost of transport by land and by water. For the benefit of those persons (if such there be) who may be disposed at the first glance to undervalue the importance of the subject, or to hold that it was settled, once for all, by the opening of the London and Birmingham Railway, we may remark that the question is one of sufficient doubt, sufficient importance, and sufficient timeliness, to form one of the first subjects for original communications on which prizes are offered in the present session of the Institution of Civil Engineers. The difficulty that has hitherto opposed the useful discussion of the question has arisen in part from the outcome of a policy which, since 1833 and 1834, when the Midland Railway stood face to face with the Aire and Calder navigation, and when the Birmingham and Grand Junction Railways were opposed by the Birmingham and Grand Junction Canals, when, in fact, a free fight was joined in between the actual carriers by water and the intending carriers by land, has been steadily pursued by the latter; and that, moreover, in spite of the constant efforts of the Board of Trade. We mean the policy, adopted by the railway companies, of so publishing, and we may even add of so keeping, their accounts as to render it impossible for any opponent, or even for any friend, to ascertain at what exact rate of profit or of loss each of the very distinct branches of the trade, which they own as carriers, was conducted. To this obliteration of the materials for criticism was added the successful attempt to grasp, in one way or another, such commanding connexions of the canal system as to place the separated trunks almost entirely at the mercy of their enemies,—we will not say their natural enemies, for the true policy would have been one of alliance and mutual aid. It has thus resulted, not only that, at this time, the United Kingdom is almost the only part of Europe in which it is supposed that it is as cheap and better to convey building materials, timber, minerals, manure, and all heavy and bulky articles of low intrinsic value

by rail as by water, but that the public in general have no idea that a great question of the kind exists. If anything has been said on the subject, the reply has been that it was a mere matter for academical discussion,—no practical question at all. Men who had leisure might amuse themselves by calculations as to the theoretic cost of land or water carriage; but so long as we could have bricks or coals, carried at a third of a penny a mile, what man of business could care for anything more?

Our usual habits of insular content have hitherto prevented us from noting how very differently the matter has been regarded by our Continental neighbours and rivals. France, as some of us can very distinctly remember, caught from us the torch of industrial progress. Joseph Locke and Thomas Brassey first showed the French how to make and how to work railways. Other Englishmen whom we can name followed, and down to 1857 or thereabouts English aid was eagerly sought on the Continent, and English practice readily followed there. But there arrived a time when the pupils advanced beyond their teachers. The French, Italian, and German engineers did not allow the working of their lines to pass from their hands into those of commercial managers, however able. They applied the same process of scientific analysis to the facts of the working as to the facts of the construction of railways. The result was that they reverted to the old principles of Brindley, of Smaston, and of Telford. They found, past all possibility of question, that where it would cost more than a halfpenny to carry a ton of bricks or coals for a mile by rail, it would cost less than a farthing to carry them by water. They found that while it would cost another halfpenny per ton for interest of money on the rail, it would not cost half a farthing for interest on the canal. And having arrived at these distinctly practical conclusions, they set to work to complete their canals.

Now this, to which English men of business have hitherto paid small attention, affects us very directly in this way. It is as certain as any future event can well be that in the course of a few years France will be conveying passengers at half our present fares, and will be carrying heavy articles by water at a third of the fares at which we can remuneratively carry them by rail. And this means a tax of cent. per cent. on so much of the cost of British productions as arises from carriage, or from travelling. Such a mode of handicapping our manufacture is one that no English man of business can afford to despise.

We are unaware of the special circumstances which have, at this moment, called the attention of this particular body of working capitalists to this very serious danger to British manufactures. Whatever it may be, we rejoice at the fact. We rejoice at seeing the question pass from the domain of the formulas of the man of science to that of the ledger of the merchant. We have been long aware of many of the facts, and may have even wearied our friends in our efforts to call attention to them. Attention is all that we ask; for of the results of careful investigation of the subject by practical men of business we have no doubt whatever. The river-ways of France are alive with active labour. The new prime minister of France is himself the author of a plan which requires the outlay of from ten to fifteen millions sterling a year for the next fifteen years, on public works. These comprise the improvement of ports and harbours, and the completion of minor railways. But the great bulk of the outlay is on inland navigation. We must anticipate that one of the first steps of the Wolverhampton Chamber of Commerce will be to ascertain what France is doing as to canals, and how far her activity will affect our own.

**A New Board School, Fulham.**—A public meeting in connexion with the opening of a new Board School in Everington-street, Crown-road, Fulham, was held on Monday evening. The school has been built by Mr. Charles Wall, of Chelsea, from the plan of Mr. E. R. Robson, the architect to the School Board. There is accommodation for 481 infants on the lower floor; 360 girls on the second floor; and 360 boys on the upper floor,—total 1,201 children. With the advance of the speculating builder the cabbage-fields are gradually being covered with streets of houses, and consequently there is a large increase of population in the locality.



### "AN IMPORTANT ECONOMY TO BE EFFECTED BY THE BUILDER."

SIR,—I have read the leading article in the *Builder* of January 28th, with the above title, in which you direct attention to the advantages of employing coverings to scaffolds or building stages, and the advisability of completing the heating or warming arrangements immediately after the slating in of our buildings,—the one to allow of the work being carried on as well in wet weather as in dry; the other to diffuse a warmth and dryness during the finishing operations, so that, as you aptly put it, "seasoned timber is not allowed to lose in a few weeks of neglect the quality which it has taken years to gain."

The latter precaution I have adopted for some years in all works designed by me in which a heating apparatus was arranged for, and I can well endorse what you say as to its advantages.

With regard to covered scaffolds, the following extract appeared in the *Scientific American*, in 1879, from some remarks of mine in reference to the "screw scaffolding" which I had designed and used in the construction of one of my buildings:—

"As to the covering in of these scaffolds, all that the builder requires to do for this purpose is to stretch tarpaulins or covers over such portions of the ledgers as will afford the necessary protection to the working platforms and walls. These coverings may be placed in position when the scaffolding is first fixed, as they add but little to the weight, interfere in no way with the raising operations, and go up with the scaffold without further attention or alteration."

There is no valid reason why the whole operation of building should not be carried on under cover, and the 'waller' be placed in as good a position for doing his work as the 'stone-dresser.'"

A perspective view and description of this "screw scaffolding" appeared in the *Scientific American*.

I am quite at one with you as to the advisability of having a builder's plant so designed and arranged that he need not care whether it "rains or shines," and this will apply equally to works of any importance throughout the country. But what shall be said as to expediting building operations in those portions of London more particularly devoted to business, and in those great traffic arteries stretching westward from the Bank? Here is a field for "an important economy to be effected by the builder," by the workman, by the ground-owner, by the tradesman, and by the general public.

I can conceive of a time when it may be deemed advisable by Parliament or local authorities to insist, in the interests of the public, on relays of workmen being engaged, so that the pulling down and building up, in populous centres, may be conducted continuously during the whole twenty-four hours of each day.

As I should propose these operations for towns, gas for night working could always be had, and at no distant date, electricity may possibly be pressed into the service of the builder. Indeed, as building operations in busy thoroughfares,—if I am as an architect, dare more than whisper it,—are always a nuisance to the public, and ought to be got out of the way as rapidly as possible, the intelligent builder will endeavour to limit the duration of such operations, so that he may put off the day when his craft shall be "harassed" or "regulated" in the direction indicated.

If a large building company were established in London, with the distinct object of working in wind or calm, in rain or dry weather, continuously day and night, so as to finish our buildings in one-fourth, or even one-third, the time now spent in such operations,—who can say what percentage above current rates capitalists would not be prepared to give for these advantages? Such a company could undoubtedly command good prices and an abundance of work, and ought to divide a handsome dividend.

I have no hesitation whatever in saying that such a system of scaffolding, &c., could be devised as would admit of every hour, during both day and night, being fully utilised, in fair weather or foul, and that in winter as well as in summer.

J. J. LISH.

**Election of a Royal Academician.**—At a general assembly of the Royal Academy of Arts, held on Monday evening, Mr. Joseph Edgar Boehm, sculptor, was elected a Royal Academician.

### PARISH GUILDS OF HEALTH.\*

SIR HENRY COLE suggests that, for the protection of health and the prevention of fevers of all kinds, a Guild for Health, voluntary, self-supporting, and self-managing, should be established throughout the kingdom, in every parish district at least, and that there should be a central station or office established in it, connected with some suitable shop, such as an ironmonger's, turnery, &c., on the principle of post-offices.

The objects of a guild organised on self-supporting principles should be, by means of a contractor,—

a. To distribute printed information of Local Boards of Health and other society's rules on all sanitary subjects, drainage, ventilation, water-supply, heating, &c.; to supply sanitary publications at the cheapest rate; also to publish a cheap periodical journal.

b. To exhibit and sell specimens of various sanitary apparatus, &c., such as cleaning machines for house-drains, different washing-machines, disinfectants, &c.

c. To promote the proper removal from private houses of patients suffering from small-pox, typhoid fever, or any infectious ailment.

d. To provide skilled labour to perform constant sanitary work, and all those many minute but most necessary details of work which the parish officers cannot, and perhaps ought not to, undertake, such as,—

1. Periodical cleaning of house-drains, gullies, traps, &c.

2. Periodical examination of proper supply of water, and cleaning of water-cisterns, pipes, &c.

3. Periodical examination of kitchen-fires and boilers, and the cleaning and repair of them.

4. Proper management of dust-holes, and separation of garbage, to be afterwards removed by parish officers.

5. Miscellaneous occasional work, such as window-cleaning, sweeping snow off the roofs of houses, &c.

At the outset, a Superintending Committee, to include medical practitioners of the district, with chairman, treasurer, and secretary, should be organised for each district, with power to appoint a contractor for works stated, also a distributor of information and canvasser for members.

A scale of fees for each class of services to be performed by the tradesmen contracting to do it, should be fixed by the committee of each district; the fees being regulated by the probable demand for services and their nature in the district.

The subscription for registering a member of the Guild might be, say 1s. a year, or any sum the local Guild thought necessary. Special subscriptions from the rich and benevolent might be raised to promote sanitary arrangements for the poorest classes. The work on behalf of persons living in small houses and rooms, who are not yet educated to appreciate the necessary precautions against illness, might be done for them through the benevolence of others, it being the interest of the subscribers to do such work for the security of their own health.

### HOUSE DECORATORS' CLUB AND INSTITUTE COMPANY.

On the 2nd inst. the first annual general meeting of this company was held in the Painter-Stainers' Hall, Little Trinity-lane, Queen Victoria-street. There was a large attendance of the members, and the chair was occupied by Mr. J. G. Grace. Among other prominent supporters of the movement present were:—Mr. J. D. Grace, Mr. Graham (of Messrs. Jackson & Graham), Mr. E. Monney, jun., Mr. F. Coulton, Mr. Peacock, and Mr. Hodgson Pratt.

The report of the directors stated that progress had been made slowly but surely. Several attempts had been made to secure premises to suit their requirements, but without success at present, although they were pleased to state they were in a position to commence business at once, but were desirous of its taking such proportions as would be benefiting them and the cause they had at heart. With a view of adding to the number of shareholders, they had waited on several of the employers who were favour-

\* To prevent fevers and diseases in houses by aiding, supplementing, and preserving the work done by local sanitary surveyors and medical officers of health and all societies and companies for sanitary assurance and protection.

able to their objects, and they specially mentioned the very material assistance rendered in many ways by Messrs. Grace and Donaldson. The directors earnestly called upon each shareholder to make a strong effort to induce others to take up shares, and so place the success of the company beyond doubt, and thereby enable them to take premises they should always look upon with pride. They regretted the loss of the services of their late zealous secretary, Mr. G. Grant, through business calling him away, but were fortunate in securing those of Mr. S. B. French (the late treasurer), and Mr. W. A. Thomas having resigned the office of director, had been appointed treasurer. The report having been unanimously adopted, the meeting re-elected Mr. French and Mr. Thomas to their respective offices. The following gentlemen were added to the board of directors:—Mr. A. Alston, Mr. H. Hunter, Mr. A. Turner, Mr. F. J. Pain, Mr. W. Hancock, Mr. T. Stuckey, Mr. F. Cook, Mr. G. Shaw, O.C., Mr. E. Brown, and Mr. Poynter.

The Chairman then stated that they had finished the purely formal part of the proceedings, and now they had to consider how best to set about the somewhat difficult task of obtaining a suitable building for their proposed club and institute. Personally, it gave him great pleasure to assist in any movement which had for its object the providing of means for rational amusement and social intercourse, especially amongst those belonging to his own craft, without imposing upon them the necessity of resorting to the public-house. He had letters in his possession from large employers offering pecuniary assistance, and he was certain the Painters' Company, though small in numbers and not overwhelmed with this world's wealth, would do their utmost to encourage house-decorators in the practice and the perfection of their art.

Mr. Hodgson Pratt afterwards delivered an address, pointing out, from his long and intimate experience of working men's clubs, how success was most likely to be attained. The remainder of the evening was occupied in discussing questions of detail, and it was announced at the close that Mr. Graham, Messrs. Cowton & Co., Mr. F. Cowton, Mr. J. D. Grace, and Mr. Laing (of Messrs. Laing & Co., Duke-street, Adelphi), had each taken ten shares in the company.

### WATER AND SEWAGE CONTAMINATION.

In the course of a paper read at the Institution of Civil Engineers on the 24th of January, on "The Analysis of Potable Water, with special Reference to the Determination of previous Sewage Contamination," by Mr. Chas. W. Folkard, the author considered the bearing of biological research on the subject, pointing out that mere dilution had an almost inappreciable effect in disarming the germs of disease of their power. Thus, supposing a glass of water to contain but one germ, if the person taking it was sufficiently unhealthy or weakly, he would contract the disease almost as certainly as if there were hundreds of germs. In the author's opinion it would be impossible to banish zymotic diseases from towns the water supply of which contained the debris of persons suffering from the disease, even though present in the most minute quantity. The very weakly would contract the complaint from the water, and from them it would spread to the more robust around them. Again, these germs were endowed with such persistent vitality, that they withstood the effects of heat and cold, moisture, drought, and chemical agents, to an almost incredible extent, affording what seemed, at first sight, indisputable evidence of the now exploded doctrine of spontaneous generation. From this it appeared that once-contaminated water was unsuitable for dietetic purposes.

In conclusion, the author contended that a radical change was the only remedy. Irrigation and chemical treatment were alike powerless; in addition to which, during the heavy rain, all existing sewerage systems were incapable of dealing with the huge volumes of water poured into them, and the sewage was allowed to flow direct into the river, to the manifest disadvantage of the towns below, which were dependent upon it for their water supply. Filtration, again, was powerless to effect real purification. The germs of disease were so minute that they could pass one hundred abreast through the interstitial spaces of ordinary sand, and dissolved substances were, of course, unacted upon. In view of the great



increase in cancerous diseases of the stomach and intestines, the subject was worthy of the most careful study; and, taking into consideration the unreliability of the results afforded by chemical analysis, the only way to ascertain if a sample of water was fit for drinking purposes was, in the author's opinion, to trace it to its source, and see that contaminating matter was excluded, from the time that the water fell as rain till it entered the reservoir or engine-well.

#### TOPOGRAPHICAL SOCIETY OF LONDON.

On the 3rd inst. the first annual meeting of the Topographical Society of London was held in the Court-room of Drapers' Hall, Throgmorton-street, by the kindness of the Court of Assistants of the Company. The Right Hon. J. Whitaker Ellis, Lord Mayor, who has been elected President of the Society, took the chair, and there was a good attendance of members.

The report of the Organising Committee was presented and read by Mr. T. Fairman Ordish, hon. secretary. It contained the following passages:—

"The preparation of the view of London, by Van den Wyngaerde, the first part of which has already been issued," has required great care, and necessarily occupied much time; but the remaining portion is now in a very forward state, and will be ready for publication in a few months.

It is proposed that when several maps of a particular period have been produced, a volume descriptive of all of them shall be issued. By this means the repetition, which would be unavoidable in several descriptions, will be saved, and the further advantage of comparison of details will be obtained.

Another branch of the Society's work which is of paramount importance is that of registering the various changes that are continually taking place in London. For this Mr. Ennis, a member of the society, has prepared a view of the excavations at Leadenhall, showing the relics of the old buildings; and Mr. Miliken, another member of the society, has made several drawings on wood of houses that have been pulled down within the last year or so. This system of the registration of changes is one, however, of too vast a character for one or two persons to deal with adequately. The Committee look upon this task as one of the greatest importance, more especially as no organisation exists at present for carrying it out, and they therefore hope that it will be possible to arrange the system of local committees, which was proposed in the statement made at the inaugural meeting of the society.

Of work in hand, special mention may be made of the extracts from the Calendars of State Papers, which are being proceeded with, and will probably be printed soon after the completion of Wyngaerde's view. The importance of these volumes is known to all those who have frequent reason to consult them, but the many valuable local allusions have never been used as they deserve to be by the historians of London, so that a series of these extracts, combined with extracts from the Reports of the Deputy Keeper of the Rolls and the Historical MSS. Commission, cannot fail to throw a flood of light upon the history of London. In addition to these extracts, Mr. H. B. Wheatley has proposed to compile a Handbook of London Topography, which should contain a rapid sketch of what has been done in the subject, and what is still left for a London Topographical Society to do.

Mr. Wheatley having made a statement as to the future work of the Society,

The Lord Mayor, in moving the adoption of the report, said he knew of nothing more important in the history of a country than that impressions should be retained of its surface. Literature dealt mainly with the manners, habits, and customs of men, and except in some historical novels, or in works purely topographical, this matter of the surface of the country was rarely touched upon. It would be seen therefore that the work of a society of this kind was invaluable.

Mr. J. G. Crace seconded the resolution, observing that the proceedings of the Society were regarded with interest not only in England, but in America. He, however, advised the Society not to attempt too much, and to be careful not to waste its energies in doing work that had been done by other bodies.

The report was unanimously adopted.

On the motion of Mr. Wheatley, seconded by Mr. Miliken, it was resolved, "That the thanks of the Topographical Society of London be given to the curators of the Bodleian Library for their kindness in lending the original drawing of London, by Ant. Van den Wyngaerde, for the purpose of reproduction by the Society."

Mr. F. J. Fumival moved the adoption of the

rules, copies of which were distributed amongst the members, and in the course of a few observations expressed a hope that London would before long set up a bust or a statue of Chaucer, who was a citizen of London. As a student of Shakespeare and Chaucer, he (Mr. Fumival) was in a position to testify to the great value which the work of the Society was likely to be to literary men and students of history.

This was seconded by Mr. Harrison, who thought that the annual subscription (one guinea) had scarcely been fixed at a sufficiently high figure.

The officers and council were then elected, viz.:—

*President.*—The Right Hon. the Lord Mayor.  
*Vice-Presidents.*—Earl Beauchamp, the Earl of Rosebery, Sir Joseph Bazalgette, O.B., and Mr. George Gecwin, F.R.S., F.S.A.

*Treasurer.*—Major-General J. Ballie.

*Director.*—Mr. Henry B. Wheatley, F.S.A.

*Honorary Secretary.*—Mr. T. Fairman Ordish.

*Other Members of Council.*—Messrs. E. W. Ashbee, F.S.A.; Wynne E. Baxter, F.G.S.; Arthur Gates, F.R.I.B.A.; O. E. H. Chadwyck-Healey; F. J. Fumival, M.A.; E. Laurence Gomme, F.S.A.; Mr. Alderman and Sheriff Hanson, M.A.; Richard B. Prosser; W. Beadle; Owen Roberts, M.A.; Edward Solly, F.R.S.; John Tolhurst, F.S.A.; and Edward Walford, M.A.

On the motion of Mr. C. Markham, seconded by Mr. Prosser, a vote of thanks was given to the Drapers' Company for the use of their hall.

A vote of thanks was given to the Lord Mayor, on the motion of Mr. O. Roberts, seconded by Mr. Steevens (of the United States), and his lordship having acknowledged the compliment, the proceedings terminated.

#### PROPOSED MEMORIAL OF THE LATE MR. STREET.

On the 3rd inst. a meeting was held in the rooms of the Royal Institute of British Architects, 9, Conduit-street, for the purpose of promoting a memorial to the late architect of the Royal Courts of Justice. On the motion of Sir F. Pollock, the Right Hon. A. J. B. Beresford-Hope, M.P., was called to the chair. He said:—It is a melancholy cause which puts me here, and I am sure you share my grief, but it is a consolation to be able to take part in a memorial to our honoured, dear, and most eminent friend George Edmund Street. We have met, not to make speeches, but to do business. I need not say who he was or what he was, for every one here knows his eminence, which was not special, but general, and which fully deserves a worthy memorial. There are many kinds of memorials, some better, some worse, all having their merits, but there is one as to which all will agree in regard to its propriety. It is due to Mr. Street that it should be put in a conspicuous position, which will make posterity, who might otherwise be forgetful, remember who he was and what were his performances—I mean some effigy in the Law Courts. I use the word effigy because it is a mere matter of money whether that effigy shall be a statue or a bust. I trust there will be money enough for a statue, but, whether statue or bust, the presentment of his person in some conspicuous place in the Law Courts. There is a precedent for a statue in that of Sir Charles Barry in the Houses of Parliament, and if there were not that precedent we might now well make one. I have a letter from the Lord Chancellor, and the assent of Mr. Shaw-Lefevre, so there will be no difficulty in regard to permission for its erection, and it only remains for us to agree to a memorial, to appoint a general committee and officers, and also a sub-committee to deal with details, and suggest a sculptor or sculptors, when a subsequent meeting of the general committee is held.

Mr. Wells, R.A., then moved:—"That, in the opinion of this meeting, it is advisable to take steps for placing a statue or other sculptured memorial, giving a portrait of Mr. G. E. Street, in the Royal Law Courts."

Mr. Robinson, Q.C., seconded this, which was carried unanimously.

Mr. A. W. Blomfield was then elected honorary secretary, Mr. Waterhouse, A.R.A., treasurer, and a long list of influential names, including the Prince of Wales, the Lord Chancellor, the First Commissioners of Works of the present and late Governments, a number of bishops and deans, judges and barristers, with power to add to their number, was submitted and adopted. From these a sub-committee was selected, and agreed to. It was decided not to publish the list of the general and sub-committees for a few days, as many are away on circuit whose names will, no doubt, be appended when they have

been communicated with. After the meeting of the general committee, the sub-committee remained sitting to initiate their labours.

We understand that, curiously enough, Mr. Street, when once pointing out his place in the Law Courts buildings which is to be occupied by the statue of the late Mr. Field (who took a very active part in the movement in favour of the concentration of the courts), jokingly said, with reference to a spot in the immediate vicinity "And here, if they ever think fit, they can place a statue to the architect of the building,"—or something to that effect.

#### MUNICIPAL CONTROL OF STREETS AND BUILDINGS.

At a meeting of the Liverpool Engineering Society, held at the Royal Institution on the 1st inst., Mr. William Goldstraw read a paper on "Municipal Control of Streets and Buildings." The author showed that from the earliest times the arm of power had been put forth in the control of streets and buildings, generally with much benefit to the community. Ancient Rome and Medieval Europe were referred to for instances of restrictions in these matters. In Paris there had been building regulations of gradually increasing severity from the thirteenth century to the present day; and that city had now reached a higher standard in this respect than perhaps any other place. In England, public control of buildings dated as far back as 1189, when twelve aldermen of London formed a court to assist the first mayor in dealing with this special subject. After referring to the determined efforts made in the reigns of Elizabeth and James to impose limits on builders, the author dwelt on the rules for rebuilding London after the Great Fire of 1666. The Act then passed was in many points the prototype of all Building Acts; in some respects it went further than modern regulations. Since that period, a large number of statutes had been passed to insure the health, safety, and comfort of dwellers in towns. The author traced the history of these enactments and of many attempts to consolidate and amend them; and showed that both in London and the provinces, the number and intricacy of the various laws and authorities on the subject were causes of great annoyance and perplexity, both to officials and to persons concerned in building. Municipal surveyors found great lack of information on the subject; and nearly every town had rules differing from those of another. The remedy he suggested was a general Building Act for the whole country. As a beneficial example, the Public Health Act, 1875, was referred to. The author believed that the Model By-laws issued by the Local Government Board in 1877 would pave the way for a general statute; and that body appeared to be the only one able to frame and carry such a scheme. Architects and engineers could help on the desired end by procuring local enactments having features in common, and by speaking in concert on behalf of a comprehensive measure. The passing into law of the lapsed County Boards Bill, or of the expected County Government Bill, might create an immediate necessity for a general Building Act. Isolated effort could do little in such a matter. To the unsuccessful Bill promoted by the Metropolitan Board of Works in 1874 must now be added a partial failure in Liverpool. The City Engineer had recently put forward a complete proposal for the consolidation and amendment of the building regulations of Liverpool, which might have formed a rough basis for a general Act. This scheme, however, had been consigned to the limbo of unrealised projects.

**Church and Churchyard Protection.**—The council of the City Church and Churchyard Protection Society, at their last meeting, Mr. Edwin Freshfield, M.A., F.S.A., in the chair, took into consideration the case of St. James's, Garlickhithe, having ascertained that the rector is entirely averse to the demolition of his church, as are also the patrons, the Dean and Chapter of St. Paul's, and the parishioners. The council unanimously decided to oppose the London and Western Railway Bill so far as scheduling the church in the line of demarcation is concerned. Mr. Henry Wright stated that the Painters' Company, whose hall is situated in the parish and close to the church, is opposing another Bill, which will take their hall and almost obliterate the parish.



## COMPETITIONS.

*East Loos Church, Cornwall.*—In this competition the designs sent in were submitted to Professor T. Roger Smith for his opinion. At his suggestion, the committee have selected a design under the motto "Briton," which is by Mr. Edwin J. Munt, architect.

*All Saints' Church, Leves.*—The committee have selected, from the seven sets of plans sent in competition for this work, a design with the motto "Experientia," prepared by Mr. Bassett-Smith and Mr. E. J. Munt, architects, London.

*Newcastle Union Offices and Workhouse.*—The plans submitted in competition by Mr. W. H. Dunn, of the firm of Thompson & Dunn, architects, have been accepted by the Guardians, and the author awarded the first premium, both for the proposed new block and receiving wards at the workhouse and the new board-room and alterations to the Union offices, Pilgrim-street. The competition was limited to local architects.

## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

413. B. L. Thomson, London. Protecting roof, walls, &c. Jan. 27, 1882.

424. M. Ingram, Manchester. Preventing waste of water from lavatories and baths. Jan. 27, 1882.

437. J. Imray, London. Apparatus for effecting fireproof separation of the stage and proscenium. (Com. by K. Pfaff, Vienna.) Jan. 28, 1882.

438. J. Imray, London. Manufacture of decorating paper. (Com. by A. Cottais, Paris.) Jan. 28, 1882.

445. J. Jaffrey, Manchester. Domestic fire-grates, &c. Jan. 28, 1882.

449. J. W. Brown, Leamington. Kitcheners and cooking-grates, &c. Jan. 28, 1882.

468. E. Wilkins, London. Apparatus for sustaining sliding window-sashes, &c. Jan. 31, 1882.

469. J. Parkinson, Caton. Furnaces for heating greenhouses, &c., by hot water. Jan. 31, 1882.

505. J. D. Brunton, Westminster. Apparatus for dressing stone, &c. (Partly com. by F. H. J. Trier, Boston, U.S.A.) Feb. 1, 1882.

519. G. W. von Vanrocki, Berlin. Fireplaces. (Com. by R. Müller, Berlin.) Feb. 2, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named.

Jan. 31, 1882.

4,136. W. Truswell, Sheffield. Appliances for heating by steam. Sept. 26, 1881.

4,186. F. H. F. Engel, Hamburg. Treating calcareous bricks. (Com. by J. A. A. Renck, Wiekendorf, Germany.) Sept. 28, 1881.

Feb. 3, 1882.

4,795. G. W. von Nawrocki, Berlin. Kilns for burning bricks. (Com. by E. Arnold Fürstenwalde, Prussia.) Nov. 2, 1881.

4,796. G. H. Jennings and S. Jennings, Stangate. Lavatories and urinals. Nov. 2, 1881.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending February 4, 1882.

2,759. S. L. Coates, Newport Pagnell. Door-latches.

The bolt is withdrawn by lifting a handle in connexion therewith, instead of by turning the same. A transverse piece slides in an opening in the rear end of the bolt, and on the handle being lifted it draws the transverse piece out, and a spring forces the bolt out. When the handle is depressed the inclined surface of the transverse piece draws the bolt in again. June 24, 1881. Price 6d.

2,762. T. Barnby, Birmingham. Adjusting action for chairs and couches.

The "rack" of the action is made in form of a continuous scroll or series of curves, so that there are no angles or dead joints to overcome. June 24, 1881.

2,786. T. Carder, Chadleigh. Kilns.

A series of arched kilns is arranged in an elliptical or circular form, the chief novelty is the leading the flues from the furnace through the one kiln, and then to a space under the furnace of the next kiln, whereby a hot blast is directed into the second furnace, greatly increasing the heat, and so on, all round. June 25, 1881. Price 6d.

2,789. H. Otway, London. Roller for roller-blinds.

For circular windows, and to enable the blind to follow the curve of the window, on a rod, suitably curved, are

placed a number of short rollers, the ends of which fit loosely into rings and are connected by short pins. On the first roller being turned, all the others revolve with it, thereby rolling up the blind. (Pro. Pro.) June 25, 1881. Price 2d.

2,809. W. Joy, Aylesford. Apparatus for the manufacture of cement.

This is an improvement on Patent No. 3,598, of 1877. A flat chamber is built above the kiln, beneath the floor of which are flues, through which the heat from the kiln passes on its way to the chimney. The slurry is run on to the floor of this chamber to be dried. June 27, 1881. Price 8d.

2,854. L. A. Brode & R. Muir, Glasgow. Manufacture of baths, &c.

The inside is formed of slabs of marble, and a mould is built round. Into the space between the mould and the lining a liquid cement is poured and allowed to harden. (Pro. Pro.) June 30, 1881. Price 2d.

## NEW REDUCING AND WASHING FLOORS, LANNER, CORNWALL.

A LARGE corrugated iron building is now being erected for the Bellvean Tin and Copper Mining Company (Limited), at their works at Lanner, Cornwall, the outside dimensions being 130 ft. by 60 ft., supported by columns. The crushing-rolls, machinery, pulsators, &c., will be placed at the east end, and beyond this are the engines, boiler-house, &c. The remaining portion of the floor-room will be used for the "buddies," and other washing and dressing purposes. To the south will be the counting-house, mine captain and manager's rooms, also workmen's dining and dressing rooms, stone, joiners' and blacksmith's shops, &c. The reducing machinery includes all the latest improvements, and this will be the first building of the kind erected in that part of the country.

Mr. D. Burns, F.G.S., of Carlisle and Silloth, is the engineer; and the works are being carried out under the personal superintendence of Mr. D. Mackenzie, G.E., &c., the company's resident manager, by Messrs. J. Leach & Co., contractors, Manchester.

## YORK GATE.

SIR,—The interest so generally felt with respect to York Gate will call forth expressions of commendation to your correspondent, "P. H. B.," in directing attention to it in any way. The condition for a long time has not added to its beauty or appearance, its base being buried by the earth of the newly-formed flower-beds; and this is the more to be wondered at since money has been so freely and so judiciously spent in the ornamental gardens in front of it.

I do not follow "P. H. B.'s" suggestion for its removal, not only because a water-gate to a hospital on the banks of the river would be of but little service now that the Thames is not used for passenger traffic in a way that the gate could serve, but from regard to the monument itself.

An examination of the gate will show that it would be impossible to remove it without its all but total destruction. It will continue for a lengthened period where it is if it has but the ravages of time only to contend with, but its decayed and worn condition would cause its loss under the process of taking to pieces and removal. What portions might survive this would require to be re-worked, either to agree with the new stone necessary or the altered position, and the identity of the monument would be gone. Under these circumstances, the removal would result in but an almost new copy accomplished by the loss of the original. If St. Thomas's Hospital or any other site is found to require a water-gate, by all means let the admirable design be followed exactly if so wanted, but this can be done at much less cost than would be necessary to remove, and without the destruction of the original.

Proposals for removal have been made at various times, and several sites have been suggested. But why should it be moved at all? It occupies its original site, and is interesting on that account, and as marking the position of the mansion to which it belonged. It also serves to show the old line of the Thames, and affords evidence of no little interest to the present, and I hope it may to many generations of spectators yet to come, how great has been the work of reclamation effected by the great Embankment, of which the metropolis may justly be proud. It can be well studied in its present position; and all that is wanted is to have the earth, which has accumulated at its base, cleared away to show the level and the proper proportion of the gate. I am glad to hear that this very desirable

work is in contemplation. Beyond this, a little stopping and pointing to the stonework will arrest decay for some time.

Your correspondent's allusion to the colonnade of Burlington House deserves public attention. Many months ago I paid a visit to the mass of ruin now lying in Battersea Park. A troop of school children were running over the graceful carving and the entwined initials of the frieze, which latter was laid out in a long line as if to form a convenient run for them, while the more robust and hard-footed were jumping from stone to stone. The columns, which have more than once come in for their well-deserved mood of praise for the elegance of their proportions, in the pages of the *Builder*, were lying uncarved for except by the children, who were trying their skill in walking over them in their prostrate condition.

This state of things but too fully justified the remark of one of the park-keepers, that there would soon be nothing left worth recreation.

It is greatly to be deplored that such an admirable work of art should be lost to us and to those to follow us, when it can be prevented by the moderate outlay requisite for the recreation; but if so spent, it must be done at once.

Surely, if the public funds have fallen so low as not to justify such a work as this being done, yet it may be possible to place a few hurdles around the stones to prevent the use of the spot as a place of recreation?

E. P. LOFTUS BROCK, F.S.A.

## THE INVASION OF ANTS.

SIR,—“J. A. P.” has not yet earned the reward. The ants of which he speaks are a different species to those that infest our houses; and I am quite sure that I should not find our pests in the work just advertised by Mr. H. C. McCook, “The Honey Ants of the Garden of the Gods,” to which is prefixed the honeyed criticism of the *Spectator*, “A most fascinating account of one great tribe.” Their origin must be sought in some other place. They are about the thickness of a pin's point, and from one-eighth to three-sixteenths of an inch in length, and their power of reproduction is a million times in proportion to their size. They have evidently not the same “amount of intelligence” as those defeated by “J. A. P.” for my cook has laid most cunning traps, and scalded millions, but the survivors will not take the hint.

Naphtha is the same treatment as carbolic acid, which they avoid, I fancy, from the great power of their sense of smelling. F. S. A.

SIR,—The best remedy I find is as under:—Take a handful of coarse sugar, and a small quantity of plaster of Paris; rub these together in your hand, and strew the mixture about the floor. I am quite satisfied if they make one meal they will not require the second,—not the same ants. If fresh ants appear, give them the same dose. It is a very simple remedy, and quite safe.

WATFORD, HERTS.

Another correspondent pronounces camphor a certain cure. If any of our correspondents test the various remedies which have been suggested in reply to “F. S. A.'s” letter, we shall be obliged if they will communicate to us the results.

## STAINED-GLASS WINDOWS.

SIR,—In the last impression of the *Builder*, I read with much interest an article referring to Mr. Lewis F. Day's paper on Stained Glass, which was read before the Society of Arts last week. Although I, and many others who have read Mr. Day's able paper, quite concur with most of his opinions, especially with regard to the notoriously inefficient price for good work, which cripples alike the designer and painter, and also other points which were touched upon, I must take exception (as many others who have read the paper will, I have no doubt) to his naming Mr. Burne Jones as the only artist of independent note as a painter whose glass is worthy to be named with the best old glass. It reads, to say the least, very depreciatory to many accomplished artists whose names I could mention, who have, as Mr. Day himself observes in an earlier portion of the paper, “identified

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.



themselves with glass-painting, and won a well-merited reputation by it." Of course, opinions on art, as on every other subject, differ widely, and although many of the most talented designers and painters do not work in accordance with Mr. Day's ideas, their works are quite as concurrent with the true principles of stained glass and also with the recognised precepts of art, both as regards form and colour, as Mr. Barne Jones, whose work, though worthy of high praise, appears to me to be unduly elevated by Mr. Day, at the expense of his contemporaries.

J. J. WREATHALL.

#### EASTBOURNE SANITARY EXHIBITION.

SIR,—A correct list of awards was given in your issue of 3rd Sept. last. The awards consisted of "Certificates of Merit" and "Honourable Mention." In last week's *Builder* a list is printed of awards of silver and bronze medals, but the convertible lists do not correspond. Those who received certificates of merit do not all receive silver medals; and those who received honourable mention do not all receive bronze medals. The explanation is very simple. After the close of the exhibition, a circular was sent round to the exhibitors by an Eastbourne house, asking the exhibitors if they would pay 2s. or 2s. 2d. for a medal. We declined. Hence, our name is present in the first list and absent in the second. So it is with many others.

FREDK. EDWARDS & SON.

\* \* We have received other letters complaining of this arrangement,—obviously a very objectionable one.

#### PUBLIC RECORD OFFICE.

SIR,—It is with great regret that I have to inform you that the Public Record Office, Fetter-lane, London, has been, to all intents and purposes, for several days during the past month, entirely useless to the public. When I make this assertion, I am sure you, and thousands of others who read this letter, will be surprised; but your surprise will be increased when I tell you that the cause of the uselessness is the want of artificial light, and that that grievance exists through some extraordinary ideas, which savour much of red-tapeism, for while the public are not allowed a light there, the officials have the use of gas throughout the building to their heart's content.

In all the other Government Offices during the terribly foggy weather, gas, or other artificial light, has enabled the public business to continue without interruption, but at the Public Record Office, through the not very commendable spirit of the powers that be, the public time has been most unjustly wasted. I do not speak thus harshly without cause; and you have, during the past two years, more than once called attention to the grievance.

The grievance is greatly aggravated by reason of the extraordinary system which allows an extensive use of gas throughout the building,—in the officers' rooms, library, and corridors,—and yet withholds a single jet from the search-room, where all the public business is transacted.

A petition, numerously signed by the public, was presented some months ago to the deputy-keeper, asking him to provide some kind of artificial light,—easily done by means of a few yards of pipe and one or two burners, by which gas could be used during the dark days. Without attempting to inquire into the grievance, the reply came that the introduction of a light would cause danger to the records. This reply might have been expected from one of the office clerks, affrighted at the prospect of having to work during the dark days, but it was an insult to the petitioners as coming from the head of the Office. Why? Because the writer, in his hurry to crush the petitioners, forgot discretion,—forgot that the most valuable and priceless records in the country, the Domesday Books and other famous manuscripts,—were daily exposed to danger by the free use of the open fireplaces and gas in the very room in which they are preserved.

The petitioners then, and the public now, only require that the gas should be laid on to the reading-room, so that when the darkness sets in transcribing can still be continued without a break. The public do not expect fresh documents to be produced when it is too dark for the attendants to find them in the strong-rooms. At present, when a fog comes on, we have to sit round the open fireplaces, and tell anecdotes, &c., which is certainly far from creditable employment of time.

There are other grievances at the Public Record Office which the public have a right to see remedied, seeing what an expensive establishment the building has been since the day it was opened; but the question of light is of the first importance, and I do hope, as this appeal will be read by the heads of the Department of the Office of H.M. Works, they will at once inquire into the matter, and thus enable the reader to see during the dark days; for I assert, without fear of contradiction, that there can be no danger in that fireproof-room of the use of gas, which is already in the adjoining officers' rooms, and that if the gas is so very dangerous, why have it in

the building at all? and why have it at Somerset House, where more priceless records are preserved,—the wills of those who have died during the space of more than 500 years?

RECORDED.

#### ANTHRACITE.

SIR,—During the last few weeks I have noticed letters in your issues on the above, and I venture to send you these few lines, thinking some of your readers may be interested in the actual results of the use of anthracite in ordinary grates, and as I do not desire to "create premature prejudices or unfounded fears," I will confine myself, as far as possible, to a brief statement of the results of my experiments, which show:—

1. Its extremely slow combustion, and, therefore, economy.
2. Its smokelessness and cheerful appearance.
3. Its generation of carbonic acid.

I certainly think the first a negative advantage; for it is practically impossible to make a fire with it alone. I have tried it in open range, register, Abbotford, and Tyndall grates, and find it only possible to have a good fire where anthracite is put on top of ordinary coal well alight. Then, as long as a good fire is kept up, you can continue its use; but once let the fire get low, and recourse must be had to your common coal again. This is, of course, more apparent when used in the slow-combustion stoves mentioned. It fails most in the open range; for the fire must be made up so long before, and lasts so long after it is required, that the kitchen becomes anything but a pleasant place.

Its greater economy, comparative smokelessness, and its cheerful appearance, may be conceded without doubt. As to its unwholesomeness,—that it generates more carbonic acid than ordinary coal,—I am certain, in rooms with good provision for ventilation (this I found particularly apparent in the kitchen, where necessarily a larger fire was in use). Any one coming into a room with a good anthracite fire alight will perceive it in a moment. That it amounts to danger I do not believe; but that it is very unpleasant I know.

I may add, that it answers admirably in a conservatory fire for heating hot-water pipes. There is, of course, great draught, the fire being outside, and the coals heat quicker and retain their heat longer than coke; and here, again, its smokelessness is of great advantage.

Like your correspondent, "S. R.," I hope to enjoy a "warm room, a cheerful fire, and pure air," and with less smoke, too, and I believe we shall in time. In the meanwhile, I think little harm can be done to the claims of anthracite by a discussion of its qualities by those fairly interested in the subject.

A.R.I.B.A.

#### HEIGHT OF BUILDINGS AND THE BUILDING ACT.

MANSARD ROOF.

THE Army and Navy Hotel, Victoria-street, is now being erected, under the superintendence of Mr. Pilkington, architect, and a question arose upon the Building Act as to the measurement of the height of the building. Mr. Pilkington contending that the wall-head determined the height, while the District Surveyor held that the height was determined by the height of the ceilings. The roof of the hotel is a mansard one, and the height of the building passing the wall-head would be 113 ft., and it, therefore, required the sanction of the Board before being erected if the district surveyor was right in his contention. The matter was submitted to the Building Act Committee of the Board at their last meeting, when it was decided that it was a case in which the Board's sanction should have been obtained, under sec. 56 of 18 & 19 Vic., c. 122, sec. 6 of the Act providing that the "height of every external and party-wall shall be measured from the base of the wall to the level of the top of the topmost story," and that the present building, being over 100 ft., did not come within part 1 of the schedule of the Act, but as the walls were above the thickness required by the Building Act in the cases of walls up to 100 ft., that no action be taken in the matter.

The Jesuit College at Canterbury.—The spacious wing being added to the Jesuit College at Hales-place, near Canterbury, is rapidly proceeding towards completion, and when finished will afford accommodation for a much larger number of students than are now located there. Indeed, in the aggregate, the old and new buildings are arranged to provide residence for 1,000 of the youths exiled with their instructors from France. In celebration of the "top brick" being placed on the additional erection, the fathers of the college have given a dinner to 200 of the employees of the contractor, Mr. J. L. Ward, of Manchester.

#### PROVINCIAL NEWS.

Sedgley.—The tradesmen of Sedgley, in meeting assembled, have decided to erect a public hall for the district, at a cost of 1,200l., the money to be raised by 5l. shares. The persons present at the meeting decided to take shares amounting to 400l.

Derby.—A movement is on foot for establishing at Derby an Art Gallery in connexion with the Free Library and Museum. The movement owes its origin to a suggestion of Sir Philip Cunliffe Owen. The matter has been brought under the notice of Mr. M. T. Bass, M.P., who, with his accustomed liberality, has asked to be permitted to defray the whole cost of the building, estimated at about 3,000l. The site, which adjoins the Free Library, built at the sole cost of Mr. Bass, is to be given by the Mayor of Derby (Mr. Woodwiss).

Thorne (Lincolnshire).—It has been resolved to provide a new building here for use by the magistrates for petty sessions purposes, by the county court judge, and by the coroner. It is proposed to erect the building by means of joint-stock enterprise, the required capital being 1,000l. Mr. Meggitt, builder, of Crowle, has submitted a plan and estimate according to which the outlay required would be about 800l.

#### STAINED GLASS.

Maidstone.—St. Paul's Church, Maidstone, has just received an addition to its stained glass by the insertion of a window to the memory of the late Mrs. Mercer, of Sandling. It is placed in the south aisle, and is from the studio of Mr. Taylor, of Berners-street. The fixing of the window was entrusted to Mr. H. Crutenden, of Maidstone.

Nottingham.—The Church of St. Andrew, Nottingham, has been adorned by the erection of a series of memorial stained-glass windows and decorations. Messrs. Gibbs & Howard, of London, are the artists. The scheme, as arranged by the Rev. Canon Tebbutt, shows, on the south aisle, the "Parables," and, on the north aisle, the "Miracles," of our Lord. In the chancel two windows have been added, viz., the "Resurrection" and the "Ascension." The chancel ceiling is richly decorated, the frieze representing a choir of twenty-one angels.

Faversham (near Rochdale).—The east window of this church is filled with subject work, arranged in bands of colour across the window. The panning of ornament is grisaille work. The subjects represented are as follows:—At the top of the centre light, Our Lord's Ascension; and underneath, His Crucifixion. The other panels contain, on either side of the Ascension, four figures of the Evangelists; and the two remaining subjects in the side lights are respectively the Agony in the Garden, and the Maries at the Tomb. The window was designed and executed by Messrs. Heaton, Butler, & Bayne, of Garriock-street, London.

#### Books.

Report of the City Day-Census, 1881. London: Longmans, Green, & Co.

A SECOND edition of this report has been published by the Local Government Committee of the Corporation, who have added a map showing the various inlets to the City at which the enumeration was taken. The value of the census is undeniable, and some of its results are very suggestive. It is seen that the City stands second of the thirty-nine parishes and districts represented on the Metropolitan Board of Works as regards population, Islington coming first with 282,828; the City of London and Liberties next with 261,061; Lambeth, 253,569; St. Pancras, 236,209; Wandsworth, 210,397; and then follow Camberwell, Hackney, Kensington, Finsbury, Marylebone, Greenwich, Bethnal-green, Shoreditch, Fulham, Newington (Surrey), Paddington, Mile-end Old Town, &c. As regards the relative position of the City to some of the leading incorporated cities and towns, in respect of population, with the exception of the cities of Liverpool and Manchester, and the towns of Birmingham, Leeds, and Sheffield, the city of London stands at the head of the incorporated Parliamentary boroughs. With respect to the all-important feature of rateable value, as compared with the thirty-nine parishes and districts of the metropolis the City heads the list by a very considerable amount. The rateable annual



## Miscellaneous.

value of the city of London and Liberties is 3,535,494*l.*; St. George, Hanover-square, 2,005,355*l.*; St. Mary Abbott, Kensington, 1,969,501*l.*; St. Pancras, 1,791,093*l.*; St. Mary, Islington, 1,756,673*l.*; St. Marylebone, 1,656,874*l.*; then Lambeth, Wandsworth, Paddington, and Hackney, all about a million and a half; then Camberwell, St. James, Westminster, Greenwich, &c., which are under a million, but considerably above 600,000*l.*; and next follow Chelsea, Fulham, and a long list, under 600,000*l.* It may be further stated that each of the 198 incorporated cities and towns in England and Wales have a less rateable value than the city of London, the rateable value of Liverpool being 3,211,344*l.*; Manchester, 2,295,537*l.*; Birmingham, 1,455,329*l.*; and Leeds, 1,102,691*l.*; these four being the only places with a rateable value above 1,000,000*l.*

**Modern Artists.** A series of Illustrated Biographies. Edited by F. G. DUMAS. London: Chapman & Hall, Limited, and the British and Foreign Artists' Association, 19, Cockspur-street.

This promises to be a very handsome and delightful book. The three parts forming the first section, and now before us, treat of Sir Frederic Leighton, P.R.A., Mr. John Everett Millais, R.A., and Mr. Hubert Herkomer, A.R.A. The remaining sections, which, in like manner, will each contain a group of three subjects, will appear, as nearly as may be possible, at intervals of three months. Mr. Gwynn Carr, M.D., Mr. Mack Paterson, and Mr. Ruskin are to help on the biographical and critical studies; whilst Messrs. Gilbert, Herkomer, Mongin, Rajon, and Walner will produce the illustrative etchings. Original sketches reproduced in *fac-simile*, portraits of the artists, and views of their homes, form part of the scheme. We shall look at the work critically before long.

## VARIORUM.

MR. PETER BARLOW, C.E., has published a little pamphlet, entitled "Experiments and Observations," which prove that by lighting fires at or near the top, under which a plate has been fixed so as entirely to exclude the air, great economy of coal will arise, with better ventilation and other important advantages (Vacher & Sons, gratis). It is to be lighted at the top, and he claims that the advantages are such that the Legislature ought to interfere and enforce the arrangement generally. Mr. Barlow appears to be unaware that all this was set forth in our pages many years ago, several times repeated, and that the arrangement, under the title of "The Builder Fire," has been widely adopted. It is to be hoped his pamphlet will still further extend the introduction of it.—From the new issue of Cassell's "Old and New London" we get a joke or two out of the notice of the "Bedford" Coffee-house:—"The 'Bedford' was Foote's favourite coffee-house. In 1754, when it was at the height of its fame, Foote would sit there, in his usual corner, a king among the critics and wise, like Addison and Steele at 'Button's'." "The regular frequenters of the room," says Mr. John Timbs, "strove to get admitted to his party at supper; and others got as near as they could to the table, as the only wit flowed from Foote's tongue." Everybody who knew this celebrated wit came early, in the hope of being one of his party during supper; and those who were not acquaintances had the same curiosity in engaging the boxes near him. Foote, in return, was no niggard in his conversation, but, on the contrary, was as generous as he was affluent. He talked upon most subjects with great knowledge and fluency; and whenever a flash of wit, a joke, or a pun came in his way, he gave it in such a style of genuine humour as was always sure to circulate a laugh, and this laugh was his glory and triumph. Another frequenter of the 'Bedford' was Garrick. One day he was leaving the house with Foote, when the latter let fall a guinea, and exclaimed, as he looked about for it, 'Why, where on earth has it gone to?' 'Gone to the d—n!' replied Garrick, still, however, continuing the search. 'Well said, David,' was the quick and ready answer of Foote; 'let you alone for making a guinea go further than one else in the world.'"

The late Mr. Samuel Sharpe, the Egyptologist, left ample records of his life and times, and his biography is in course of preparation.

**Fulham Infirmary and Hospital.**—At a meeting of the Fulham Board of Guardians, last week, a letter was read from the Local Government Board stating, with regard to the design "M.D.," which had been sent to them, that the responsibility of selecting plans rested entirely with the Guardians. The Board had resolved to adopt and carry out the design "Experience in a Circle," and they were not prepared to offer any remarks on the plans "M.D.," which they returned. Another communication was received from the Local Government Board containing observations on Messrs. Giles & Gough's design, "Experience in a Circle." The general arrangements appeared to be as, a whole, satisfactory, but there were points in which it might be improved. Several matters were pointed out which would probably receive improvement of detail. The consideration of the letter was adjourned for a fortnight. A letter was read from the Clerk to the Metropolitan Asylum District, stating that the Fulham Small-pox Hospital would be closed from the 27th ult. Mr. Rogers said the Guardians should send a letter to the Local Government Board offering to buy the Hospital. It could be disinfected, and they would have a fine infirmary already built. The Clerk thought they would find the Metropolitan Asylums Board would want about 80,000*l.* for the Hospital. Mr. Rogers considered they might well give 80,000*l.* to get rid of a nuisance.

**New County Club for Surrey.**—We are informed that the Duke of Northumberland has accepted the presidency of the County Club which has just been established in Guildford in connexion with the "Guildford and Conny Club Guarantee Company, Limited," with a nominal capital of 3,000*l.*, in 300 shares of 10*l.* each, the number of the original members being 120. The premises selected for the company include the buildings in High-street, which a deputation to the Postmaster-General last autumn pointed out as suitable for Post-office purposes, and which have since been acquired at a large outlay by the Earl of Onslow. Structural alterations are being carried out in the buildings, under the direction of Mr. Ralph Nevill, who has prepared the plans, Mr. C. H. Sparke, C.E., architect, Guildford, being appointed by the Earl of Onslow to supervise the work on his lordship's behalf. An interesting feature of the alterations will be the formation of a vestibule, leading direct to an ancient staircase of noble proportions, and beautifully made of old Spanish mahogany, inlaid with rosewood, which is being carefully restored.

**Harleian Society.**—At the annual meeting of the members, held at the Council Room, 140, Wardour-street, on the 27th of January, Dr. George W. Marshall in the chair, the report and balance-sheet were read by the honorary secretary, Mr. George J. Armitage, F.S.A., and showed that the Society was in a very flourishing condition. The number of members on the roll, namely four hundred, had been maintained. "The Visitation of Yorkshire in 1564" had been published as the volume for 1881, and the Register Section had published "The Registers of St. Thomas Apostle, London," for the same year. After paying all demands, the Society has a balance of 504*l.* with the bankers, in addition to an investment of 632*l.* Consols. The publications in the press are the second volume of "The Visitation of London in 1633," under the editorship of Dr. Howard and Colonel Chester; and "The Visitation of Cheshire in 1580," by Mr. J. Paul Rylands, F.S.A.; also "The Registers of St. Michael, Cornhill."

**The Smoke Abatement Exhibition.**—This exhibition is announced to close on Tuesday next, the 14th inst. This, Saturday, afternoon, the 11th inst., at three o'clock, the members of the Royal Institute of British Architects are specially invited to attend. Admission will be by tickets, to be had on application at the offices of the Institute. A number of members of the Architectural Association visited the exhibition on Saturday afternoon last, under the conduct of Mr. T. W. Outler, who explained the merits of some of the principal exhibits.—It is announced that the recent visit to the Exhibition of a deputation appointed by the City authorities of Manchester has resulted in a decision to transport the chief exhibits from South Kensington to Manchester, and to open a general exhibition of smoke-preventing appliances there, upon a site offered by the Corporation for the purpose.

**The Hours of Labour.**—A correspondent writes:—"In these days, when so many expedients are suggested to reduce the cost of manufacture, may I be allowed to make the following proposition,—namely, a change in the working-hours in manufacturing businesses? From my own practical experience I can testify how much time is lost in men getting to work in the morning. Now, my proposal is this:—All men to come in at seven instead of six in the morning, and work on till twelve, thus doing away with the breakfast hour, the afternoon time to remain as now. From the point of view of one who has gone through all details, I am certain this change would be most advantageous to employers and employed. No one who has not served with the men themselves has any idea of the time wasted before breakfast, putting on coats, sharpening tools, and all sorts of pretexts for putting off time, and my practical experience is this,—Do away with the breakfast time altogether, and great economy of working will be the result."

**New Theatre, Bournemouth.**—A new theatre and opera-house is in course of erection at Bournemouth, from the designs of Messrs. Kemp-Welch & Pinder, of Bournemouth. The site is a well-chosen one, being in the centre of the town, between the Albert and Yelverton roads, and having a frontage to both roads, with good ingress and egress. Accommodation is provided for about 1,000 persons in the auditorium. The stage is roomy, and has good dressing-room accommodation. The dress and upper circles will be entered from Albert-road, and the pit and gallery from Yelverton-road, where is also the stage entrance. The elevations are in the Renaissance style, in red brick, with Beer and Bath stone dressings. Mr. W. Stanley, of Bournemouth, is the builder.

**Studentship.**—The first competition has taken place for the "Mence Smith Travelling Studentship" of 40*l.*, which was offered by Mr. George Smith, a Liveryman of the Painters' Company, to the West London School of Art, Great Titchfield-street, for the purpose of enabling students to travel abroad. The offer, according to the *City Press*, is made for three years, to be increased under certain conditions to 50*l.*, and the arrangements are left entirely in the hands of the West London School of Art.

**Lewes Fine-Art Exhibition.**—An exhibition of works of fine-art and native industry will be opened on Monday next, in the County-hall at Lewes, by the Earl of Chichester, the Lord Lieutenant of the county of Sussex. The collection of paintings exhibited includes some rare specimens, known by reputation to art-students, but not often exposed to public view. To connoisseurs of art the exhibition will be found to repay the trouble of a journey from London.

"On awarding Awards."—Under this heading Dr. Hinxton Bird complains that, having sent to the Society of Arts plans, &c., of his house, in reply to their offer of medals for houses showing the best sanitary arrangements, the judges appointed have not inspected them, having confined their visits to a few selected from those submitted. We are not in a position to offer any opinion on the subject,—the less so as the committees have not yet made any report.

**The Sportsmen's Exhibition,** to which we have alluded, bids fair to be a more brilliant success than could have been anticipated. Exhibitors seem to have fully appreciated the list of patrons, for nearly every inch of space set apart for their exhibits within the huge area of the Agricultural Hall has been applied for and taken. The exhibition was opened on Thursday last.

**The Tower of London.**—It is stated to have been decided to carry out the proposals for the improvement of the Tower of London by removing the unsightly block of War Office stores which now interferes with the view from the river, and by completing the restoration of the inner line of wall on the site of the storehouses.

## TENDERS

For completing four houses, Morblake Park, for the Prudential Building Society. Mr. W. Moss, architect:—	
Ross .....	2750 0 0
Derby .....	653 0 0
Haughton .....	530 0 0
Barlett .....	503 0 0
Mitchell .....	485 0 0
Baker .....	485 0 0
Hewlett .....	305 0 0

For warehouses, St. Mary Overy's Wharf, London Bridge, for Mr. George Doo. Mr. Geo. A. Dunnage, architect. Quantities by Messrs. Linsell & Giffard:—  
Chosen, accepted.



For removing and rebuilding dwelling-house and business premises, in Boleya-road, Kingland, for Mr. William Shepherd. Mr. R. A. Lewcock, architect:—  
 Childs ..... £2,335 0 0  
 Larter & Son ..... 2,100 0 0  
 Harper ..... 1,840 0 0  
 B. Goodhall (accepted) ..... 1,695 0 0  
 Clark & Hilden ..... 1,680 0 0  
 Capsey ..... 1,660 0 0

For new shop-front, at High-street, Stoke Newington, for Mr. E. Gandy. Mr. H. J. Newton, architect:—  
 Sharnar ..... £164 5 0  
 Sage ..... 155 0 0  
 Peckersall Bros. .... 140 0 0  
 Simpson ..... 137 0 0  
 Godden ..... 135 0 0  
 Wood (accepted) ..... 127 0 0

For decorating, &c., Oxford-place Chapel, Leeds. Mr. James Wilson, architect. Quantities by the architect:—

Decorating. Gaunt ..... £319 17 0  
 Geo. Thompson ..... £116 10 6  
 Lighting. Geo. Thompson ..... £80 0 0

For rebuilding Nos. 12 and 13, Nicholas-lane, City. Mr. Charles J. Shoppee, architect. Quantities by Messrs. Mr. F. Adams Smith & Sidney Young:—  
 G. Smith & Co. .... £9,490 0 0  
 W. Brass ..... 8,947 0 0  
 E. Conder ..... 8,470 0 0  
 Adamson & Sons ..... 8,281 0 0  
 Ashby Bros. .... 8,241 0 0  
 Stephens & Bastow ..... 8,200 0 0  
 Macey & Sons ..... 8,147 0 0  
 Ashby & Horner ..... 8,100 0 0  
 Clarke & Bracey ..... 7,850 0 0  
 Langmead & Way ..... 7,830 0 0  
 E. Lawrence (accepted) ..... 7,644 0 0

For the erection of a house at Crouch Rd., for Mr. John Smith. Mr. Collett, architect:—  
 Taylor & Part (accepted) ..... £1,984 0 0

For the erection of a pair of villa-residences at Portside Drive, on the Aldington Estate, Brighton, for Mr. W. Benham:—  
 H. & R. Winn ..... £1,443 10 0  
 G. W. Miles ..... 1,429 0 0  
 G. Kerridge ..... 1,403 7 0  
 R. Humphreys (accepted) ..... 849 10 0

For first portion of Hospital for Infectious Diseases, Torquay. Mr. Ernest Turner, architect:—  
 F. W. Vanstone ..... £3,178 0 0  
 E. Krauss ..... 3,149 0 0  
 Hobert ..... 3,141 5 0  
 Stephens & Hallow ..... 3,020 0 0  
 Petrick Bros. .... 2,984 0 0  
 Teyman ..... 2,881 0 0  
 W. A. Goss ..... 2,865 0 0  
 J. Chubb ..... 2,800 0 0  
 W. Trevena, Plymouth (accepted) ..... 2,484 0 0

For relief offices, &c., Highbury-mews, Mr. William Smith, architect:—  
 Goodman ..... £4,839 0 0  
 Capsey ..... 4,830 0 0  
 Stevens Bros. .... 4,615 0 0  
 Cole & Chan ..... 4,580 0 0  
 Brown ..... 4,510 0 0  
 Staines & Son ..... 4,484 0 0  
 Hewitt ..... 4,269 0 0  
 Richardson ..... 4,298 0 0  
 Donford & Langham ..... 4,295 0 0  
 Gentry ..... 4,260 0 0  
 J. Anley ..... 4,200 0 0  
 Morton ..... 4,155 0 0  
 Sharnur ..... 4,005 0 0  
 Mills ..... 3,800 0 0  
 Notts ..... 3,990 0 0  
 Matlock Bros. .... 3,989 0 0  
 J. Harper ..... 3,984 0 0  
 Anpood ..... 3,910 0 0  
 Carrud ..... 3,883 0 0  
 Steel Bros. .... 3,692 0 0  
 Wood ..... 3,537 0 0

For the erection of St. Paul's Church at Forest Hill. Messrs. R. W. Montford & H. D. Appleton, architects. Quantities by Mr. Edward Crutchlow:—  
 Wall Bros. .... £7,050 0 0  
 W. D. & B. Roberts ..... 6,920 0 0  
 Smith, Kensington (accepted) ..... 6,665 0 0

For alterations, &c., at Board School, Rushmore-road, Hackney, for School Board for London:—  
 Hobson ..... £7,684 0 0  
 Boyce ..... 7,595 0 0  
 Williams & Son ..... 7,478 0 0  
 Wall Bros. .... 7,349 0 0  
 Oliver ..... 7,345 0 0  
 Sharnur ..... 7,339 0 0  
 Sargeant ..... 7,246 0 0  
 Nightingale ..... 7,243 0 0  
 Cox ..... 7,021 0 0  
 Groves ..... 6,939 0 0

For new road, sewer, and surface-water drain, on the Norbury Park Estate, for Messrs. Carter:—  
 Wilson ..... £390 0 0  
 Jackson ..... 555 0 0  
 Peil & Sons ..... 540 0 0  
 Harris ..... 510 0 0  
 Pizze ..... 6 0 0  
 Bloomfield (accepted) ..... 472 0 0

For the erection of premises on the site of No. 11, Hoxton-street, Shoreditch. Mr. F. Adams Smith, architect:—  
 R. Cooder ..... £755 0 0  
 W. Gibbons & Co. .... 687 0 0  
 G. W. Beale ..... 550 0 0  
 J. Hearle & Son (accepted) ..... 475 0 0

For the erection of dwelling houses, Old Kent-road. Mr. F. Adams Smith, architect:—  
 G. W. Beale (accepted) ..... £2,120 0 0  
 No competition.

### TO CORRESPONDENTS.

Constant Reader (the Building Act contains no definition of a building. Each case has to be separately considered) — An Inquirer (ventilators for hospitals) — F. J. N. — W. H. S. — G. P. — T. P. — F. J. — J. C. — K. W. — H. W. — R. H. — M. — W. — P. — R. — H. — G. — F. — A. — S. — W. — R. — S. — O. — G. S. & Co. — S. — C. — R. — A. — R. — J. — W. — H. — S. — J. — K. — E. — T. — R. — J. — M. — J. — W. — Observer (next week) — W. C. T. (next week) — E. P. (next week)

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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# The Builder.

Vol. XLII. No. 207.

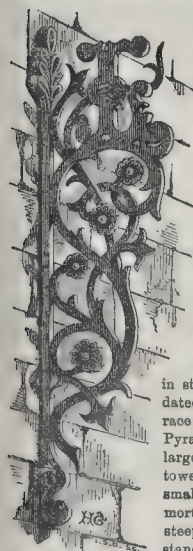
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The Early Tombs in Egypt.

LEAVING aside the sepulchres of prehistoric man scattered all over the planet and belonging to a period hazy, indefinite, and chronologically immeasurable, the oldest of all cemeteries is the city of the dead in the vicinity of the Pyramids, adjacent to the ancient Memphis. Here, symmetrically laid out in streets, are the oldest dated tombs of the human race grouped beside the Pyramids, themselves larger sepulchres, which tower amid the other smaller receptacles of mortality, as towers and steeples in a modern city stand out amongst the surrounding public edifices and private buildings. The tombs after all have survived the temples and palaces which in the course of time have been ruthlessly swept away, while the destruction of the sepulchres has proceeded at a lower rate, although they, too, are rapidly disappearing under the incessant destruction of modern civilization. Of twenty-six discovered and described by Professor Lepsius, and twenty-five subsequently found, not a stone remains. They have been all civilised into quarry stone or converted into lime. How many of those now existing will not disappear after twenty years is a difficult problem to solve, considering the effacing fingers, not of old Time, but modern Egyptian. Folios and portfolios may retain the memory of some on a very perishable paper, and, after two centuries, the whole will become a legend, unless some change comes over the spirit of the dream of destruction.

The streets or general enclosure of the cemetery itself was called *kher*, and the individual tombs *mer*, a term applied also to the brick pyramidal roofed tombs or mausolea of the monarchs, Entef and Ranubkheper at the Draha Abu'l Neggab at Thebes, and to the same shape when out of the flank of the solid rock and having obelisks in front; in fact, similar to small temples, a form of tomb which continued till a very late period, and was the conventional one of the mortuary chapel till the twenty-sixth dynasty, or about B.C. 600. The tombs of the eighteenth, nineteenth, and twentieth dynasties, or from the eighteenth to the twelfth century

B.C., such as those of the kings at the Bab-el-Melook, were called *asui*, a word implying "pipes" or passages, and were the syringes of the Greek writers tunnelled to the length of 120 ft. into the heart of the limestone rock. To these tombs the term *maha*, sepulchre, was also applied, but it is doubtful if the word indicates any special type of sepulchre.

In the cemetery of Sakkarah the bodies of poor people were not deposited in tombs of handsome architectural construction, but pitched into graves about 3 ft. 6 in. under the surface without any special arrangement; their skeletons alone remain without any traces of linen, and they are destitute of coffins; but they are sometimes placed in a roofed chamber covered with a white coating, and the bodies have around them small vases of limestone or alabaster, and bones of oxen.

The tombs of the old period, in the cemeteries of the ancient Memphis, which have any architectural importance, commence apparently as early as the second dynasty, and are continued to the sixth. They are not all ornamented with sculptures and inscriptions, but have the same general appearance, and Mariette has called them *mastabas*, a word derived from the Arabic, and meaning the raised dais, platform, or counter on which the modern Egyptian merchant sits to sell his wares; their ancient name was *asui*. They are of rectangular shape, made of masonry or bricks of rectangular shape rising to a few feet high; their external revetment, when of masonry, consists of square blocks, not always of large proportions; the interior of the walls often of rubble, but the external masonry arranged in ashlar, or the Etruscan style. Although presenting the appearance of truncated pyramids, they are not really so; the angle of inclination is so slight that, in many instances, it would take 400 ft. to make them terminate in a point or apex if their sides were produced. The blocks of which the *mastabas* are built are either of a siliceous limestone, with a bluish tint, or a marly calcareous stone, with a creamy or yellowish hue. Such of these *mastabas*, or sepulchral chapels, as they really are, as are made of bricks fall into two classes: those of yellow and of black bricks, and at the oldest period, apparently as far back as the second dynasty, or B.C. 3,000 of Lepsius, the yellow bricks were in use; for the Egyptians, even at that early age, had discovered the cheap substitute for masonry. The bricks are all sun-dried, and made on the spot with sand pebbles and Nile mud, and measure 0.22 by 0.11 by 0.07 of a metre. The black bricks, made of pure earth and straw, commence at the period of the lower half of the fourteenth dynasty, and continued till the Roman period, measure 0.28 by 0.18 by 0.14 of a metre. They are all sun-dried; no baked bricks, except the conical ones, found at the Draha Abu'l Neggab, being discovered through the length and breadth of the valley of the Nile, any that have been discovered being due

to modern incineration of old sun-dried bricks by chance or design. While the Pyramids are, for the most part, arranged like the diagonal squares of a chess-board, this arrangement, by no means, was adopted for the *mastabas* or private tombs, for, with the exception of the Mastabafel Faraun, the largest of these rectangular sepulchres which has been quite recently discovered to be the sepulchre of the Monarch Unas, of the fifth dynasty, all the others are either of members of the royal family of inferior grade, or else of the high-class functionaries of state who lived and flourished as an old nobility in the court of the oldest of the Pharaohs. It is remarkable that the *mastabas* face north, but not due north, their long axis being deflected to the east enough to account for the change of pole due to the procession of the equinoxes and the change which has taken place of the Pole Star in so remote a period of time. The mass of masonry of these *mastabas* is solid, but they often have at the north-east angle a niche or recess like a door, with jambs and lintel inside, and at the south-east angle, never west, another niche, with a stele of white limestone covered with hieroglyphs, and sometimes a kind of false door. When the entrance is on the north side there is sometimes a kind of hall, supported by two square pillars. The ceiling is continuous, without defect, sometimes, as shown by the researches of Professor Hayter Lewis, imperfectly arched. On the ground are found little vases and others on the soil which covers the *serdab*; these have to all appearance contained libations of water offered to the deceased, or his *ka* or genius. The interior of these *mastabas* consists of one or more chambers, sometimes blank, but more often having the walls covered with pictures and inscriptions. These chambers have been open from the most remote times, and long stripped of their contents, neither furniture nor other objects being found within them. All the objects within are of stone, a table, or altar of libations, at the foot of the false door, having an inscription on the face, or one side only, or often a table of offerings is found on the walls instead. The entrance-door has on each jamb the deceased, or the deceased and his wife, standing. The architrave has the principal scene,—the deceased seated with his wife at a table, and above a dedication to Anubis, not Osiris, for the usual offerings during the festivals in the course of the year. The inner chamber always contains a stele or tombstone, with cornice resembling a facade rarely blank, but generally containing a hieroglyphical dedication to Anubis, the god of the dead, resembling that on the cornice. The steles or tombstones of the old empire are always square, and either monolith or built of blocks, the rounded top not appearing till the time of the twelfth dynasty, and then not on the *mastabas* of Memphis, but in the sepulchres of Abydos. The stele was either inscribed, and then the walls of the chamber were often blank, or else the reverse



Occasionally the steles contain some short account or notices of the deceased, but even then it is limited to the offices or employments held by the deceased, the marks he may have received of royal favour, but hardly ever any details of historical character; for the *mastabas* are as deficient of historical notices as they are of mythological or other information, no divinites appearing in any of the *mastabas*.

The most important part of this mortuary chapel was, however, the *serdab*, an Arabic, not ancient Egyptian, name which has been applied to a recess in the wall of the chapel, and concealed by the facing of the wall, more often south than north, and north than west. This recess is either walled in, or with a square hole. In this *serdab* is only found a statue of the deceased, often of small size, and to this statue is supposed to have been attached the *ka*, or what the Greeks called the *eidolon* of the dead, a kind of double or reflection of the deceased, which had undergone and would have to undergo the same vicissitudes in the future state. It was distinguished from the *ba* or "soul" and the *khauti* or "shade," and the square hole of the *serdab* is supposed to have been made in order to allow the incense and libations to penetrate to the statue, of which the *ka* has been supposed to be a kind of soul, or else to permit the *ka* to go in and out of its place in the sepulchre. It was an essential portion of the ancestral worship and a modification of polytheism, showing how the statue or form had a kind of inherent soul.

After the *serdab*, the corridor or shrine of the statue, the last and most important part of the tomb, was the sepulchral chamber, to which access was obtained by a well which passed through the masonry of the *mastaba* and ended on the platform. To find this well it is consequently necessary to mount the platform, and the well lies either behind the stele or in the long axis of the *mastaba*, more to the north than the south. Under the old empire, it is from 6 ft. 6 in. to 9 ft. 9 in. square, and is revetted by large blocks of stone passing through the *mastaba*; it pierces the rock of the foundation to a depth of about 33 ft. or 80 ft., and by it the sarcophagus and other things, as well as the persons employed in the construction of the monument, were lowered to the sepulchre. The descent anciently was probably made by a ladder or cords, and at the present day cords are required for the purpose. Arrived at the bottom of the well, a short oblique passage is found leading to the funeral chamber or sepulchral vault, which is square and well built, and amongst the various *mastabas* one only has been found ornamented. The sarcophagus is rectangular, with cover vaulted, but square at the four ends, and is keyed in by a peculiar arrangement, and fixed by mortise and tenons. Some of the oldest sarcophagi are inscribed, and in them are found the bones of the corpses, which appear to have been simply laid naked, with a slight embalmment, revealed only by a faint odour of bitumen. These were not bandaged, for all traces of linen have perished, although the recently-opened pyramids of Sakkarah, containing the sarcophagi and mummies of Pepi and Haremhat, monarchs of the sixth dynasty, revealed very fine linen wraps for the bodies there discovered. The interior of the sarcophagi found at Sakkarah contained a pillow of wood or alabaster, placed, no doubt, originally under the head of the corpse, and half a dozen cups of alabaster. The floor of the *mastabas* often have the bones of oxen, which, it will be remembered, were also discovered in the second pyramid.

It appears that there are 140 of these mortuary chapels north of the pyramid, that eighty-six of these are inscribed, and that they show a different style of art and development. The first type, which may be as old as Oenepheps, of the second dynasty, and continue to Senefera of the third, exhibit with rude art a curt phraseology and an infantile tone of sculpture; of this class, about four remain. A second class, with finer art and more developed style of inscription, commences about the age of Cheops and descends to the age of the sixth dynasty, or ranges 3400 B.C. to 2000 B.C. Some of the walls of these chapels have been beautifully sculptured, and painted in most brilliant colours, and the subjects of domestic life often published. Ethnologically, the following facts are most important. They all conform to the usual Egyptian types. The flesh of the men, who even at that remote epoch were circumcised, is coloured red; the women, yellow,—

the conventional hue of the Semitic races. No Negroes are represented, but with the servants or slaves are seen a number of dolichocephalic men,—the head flat on the top, the forehead prominent, the hair divided on the forehead, the flesh coloured brown. To judge from analogy, especially of colour, these were of the Libyan race, which extended over Northern Africa, and which are known as Tamah, or Tahenn, and seen at a later period as mercenary troops, jugglers, and acrobats, and in other services of the Egyptians. No European or Semitic men are visible in these early tombs. Perhaps the dolichocephalic race pervaded Northern Africa at the earliest times. The Negroes or Nubians were not unknown at the period of the sixth dynasty, when they were conscribed for military service.

#### THE LAZARETTO OF THE LAST CENTURY.

(A CHAPTER IN SANITARY HISTORY.)

Most people know, by name at least, John Howard's great book containing the results of his investigations on the condition of the prisons of Europe. A less known, and, we believe, now scarce work by him is that in which he gives descriptions, accompanied by plans, of many of the lazarettos of different seaports, their arrangements and regulations, accompanied by his own ideas in regard to the formation of a lazaretto for England. The book throws a curious light on the condition of sanitary matters in England and elsewhere in the latter part of the last century.

The "lazaretto," the very name of which has an unhealthy and contagious sound, was the buffer interposed by Western Governments against the incursions of the plague, for which probably Europe had in the first instance to thank that very uncleanly nation the Turks. In the arcades and apartments of the lazaretto suspected goods and suspected passengers could be confined at the pleasure of the Government until their health was established. It is difficult to realise, in this day, the conditions with which commerce must then have been hampered, when ships were constantly exposed to a quarantine of from thirty up to sometimes eighty days, and their goods to be unloaded and unpacked in the lazaretto, and often, when passed in regard to freedom from contagion, returned with no little damage from the rough usage they were exposed to in the course of the investigation to which they were subjected.

The first lazaretto described by Howard is that of Marseilles, which in some respects appears to have compared favourably with a good many other similar establishments of the period. In their main features there is a good deal of similarity in the different plans given. They all contain open courts for the inspection of supposed infected goods, places (generally open arcades) for storing them, and lodgings for passengers judged to be infected, and compelled to dwell under medical inspection at the lazaretto. Of course, anything like the separation secured by the modern pavilion system in the case of buildings for infectious diseases was unknown; but there seems to have been usually a kind of systematic apportioning of the various departments. In the plan of the lazaretto at Genoa, which was much more symmetrical than that of Marseilles, the whole area, a long parallelogram, is divided into two halves, the one half devoted to "infected goods," the other half to "suspected goods," each of which seems to have been piled in a large court or quadrangle surrounded by buildings, of which the first floor was devoted to lodgings for the unfortunate suspected or infected passengers, the ground-floor and top floor for warehousing the goods. The stairs to the upper stories of warehouses are external, and without any communication with the lodgings on the intermediate floor, which is, perhaps, more than could have been expected. The centre of each of the courts aforesaid was occupied by a small chapel, not for worshippers, but only for ritual, three sides of the chapel being left open, so that the inmates of the rooms round the court could see the elevation of the Host. The two courts are divided from each other by the block of buildings containing accommodation for purified goods, a building with blank walls towards the "suspected" and "infected" courts, and windows opening on an inner court. This building for purified goods is directly opposite the main central entrance, whence the goods were removed on board ship again;

the suspected goods on being landed were turned off to the right or left according to the depth of suspicion with which they were regarded. A burial-ground was always an adjunct to the lazaretto, a painful reminder that the institution was no mere form, but the practical recognition of a real danger. The small extent of it, however, in most of the plans, seems to indicate that no very large proportion of the "suspected" were really under mortal disease. The lazaretto of Marseilles, already mentioned, was much more rambling in plan than that of Genoa, but the unsymmetrical arrangement seems to have arisen rather out of the nature of the ground, part of the site consisting of a small promontory jutting out into the sea, than from any special desire to produce a more broken-up and isolated plan. In both these plans, as well as in that of the Venice lazaretto, which is given further on, wells and water-basins are conspicuously marked in the court-yards devoted to the exposure of the goods. Perhaps if the merchants themselves, at one end at least of the line of commerce, had in the first instance used water more liberally on themselves, there would have been the less probability of their wares having to be subjected to instruction afterwards.

In describing the Marseilles lazaretto, Howard records for us some curious particulars as to the manner in which a first-class institution of this kind was worked. The first communication from a ship was with the Bureau de Santé, not actually a part of the lazaretto buildings. It had an outer room and two council-chambers. In this outer room were taken the depositions of captains of ships, who came in their boats to an iron grate. "At 2 ft. distance there is an iron lattice, with a door, which is opened only by the servants of the intendents or directors, who are here in waiting, in a blue livery, trimmed with white lace. Here also letters or orders for supplies from the captains who are performing quarantine in their ships, are received with a pair of iron tongs, and dipped in a bucket of vinegar standing ready for that purpose. . . . In the first of the two council-chambers there were hung up a plan of the lazaretto, and the picture of a person dying of the plague (!) also the names of the directors, and the weeks of their attendance." Towards the gate opening on the town road, there was opportunity provided for those who were desirous to communicate with the outer world, by means of the small apartments called *parloirs*. "The *parloirs* are long galleries, with seats in them, situated between the gates, and separated by wooden balustrades and wire lattice. Beyond this there are other balustrades, distant about 10 ft., at which the persons in quarantine may see and converse with such friends as may choose to visit them. The wires are intended to prevent anything being handed to them or from them; and that nothing may be thrown over, and no escapes made, there is a double wall round the lazaretto." Even the admission to the *parloirs*, however, was under limitation. The quarantine of passengers coming with a "clean bill" (of health) was thirty-one days. "But if the account arrive of the plague having broken out in the place from which they came with a clean bill, after they left it, they are allowed no advantage from their clean bill, for in this case they must be confined fifteen days, and also fumigated, before they come downstairs and are permitted to go to the *parloirs*. In case any of the company to which they belong die, their quarantine recommences." The existence of such regulations so lately as 100 years ago shows plainly what a terror the scourge of plague had produced in Europe. Howard, by the way, notes that the delightful process of fumigation, which was repeated three times, at a cost of 9 livres, was "by some thought unnecessary," and that it was not practised at Venice.

In the Marseilles lazaretto there is shown a small enclosure in one corner for the treatment of invalids who might be attacked by plague. A large portion of this plan is occupied by "disinfecting halls" for goods; what was the precise process of disinfection Howard tells us with much detail in another place, in speaking of the establishment at Venice, where the lazaretto system was first introduced, as might naturally be expected in the city of all others the most closely connected with the East. At Venice Howard did by the lazaretto what a writer of our own day did by the casual ward,—he determined to become a "suspected passenger" himself, and for this purpose sailed to Venice from Smyrna in a ship that had a foul



bill. His description of his experiences is a sufficiently onerous bit of sanitary history to be worth reprinting:—

"Here, after our ship had been conducted by a pilot-boat to her proper moorings, a messenger came from the health office for the captain; and I went with him in his boat to see the manner in which his report was made, his letters delivered, and his examination conducted. The following morning a messenger came in a gondola to conduct me to the new lazaretto. I was placed with my baggage in a boat fastened by a cord, 10 ft. long, to another boat, in which were six rowers. When I came near the landing-place, the cord was loosed, and my boat was pushed with a pole to the shore, where a person met me, who said he had been ordered by the magistrates to be my guard. Soon after unloading the boat, the sub-prior came and showed me my lodging, which was a very dirty room, full of vermin, and without table, chair, or bed. That day and the next morning I employed a person to wash my room; but this did not remove the offensiveness of it, or prevent that constant head-ache which I had since that time. I visited the lazaretto, and some of the hospitals in Turkey. This lazaretto is chiefly assigned to Turks and soldiers, and the crews of those ships that have the plague on board. In one of the enclosures was the crew of a Ragusian ship, which had arrived a few days before me, after being driven from Ancona and Trieste. My guard sent a report of my health to the office, and on the next morning the Consul I was conducting to the old lazaretto, which is nearer the city. Having brought a letter to the prior from the Venetian ambassador at Constantinople, I hoped now to have had a comfortable lodging. But I was not so happy. The apartment appointed me (consisting of an upper and lower room) was no less disagreeable and offensive than the hospital. I preferred lying in the lower room on a brick floor, where I was almost surrounded with water. After six days, however, the prior removed me to an apartment in some respects better, and consisting of four rooms.† Here I had a pleasant view; but the rooms were without furniture, very dirty, and no less offensive than the sick wards of the hospital. The walls of the lower chamber, not having been cleaned probably for half a century, were saturated with infection. I got them washed repeatedly with boiling water, to remove the offensive smell, but without any effect. My appetite failed, and I concluded I was in danger of the slow hospital fever. I proposed whitewashing my room with lime slacked in boiling water, but was opposed by strong prejudices. I got, however, this done one morning through the assistance of the British Consul, who was so good as to supply me with a quarter of a bushel of fresh lime for the purpose. And the consequence was that my room was immediately rendered so sweet and fresh, that I was able to drink tea in it in the afternoon, and to lie in it the following night. On the next day the walls were dry as well as sweet, and in a few days I recovered my appetite. Thus, at a small expense, and to the admiration of the other inhabitants of this lazaretto, I provided, for myself and successors, an agreeable and wholesome room, instead of a nasty and contagious one."

This way of lodging persons supposed to have infection, just as if they were prisoners charged with a crime, to whom no sort of consideration need be shown, has its parallel in the former treatment of lunatics in England, of which we get so many hints in the pages of Shakespeare and other writers. It is observable that Howard hints in a footnote that ideas as to sanitary precautions were, in some respects, going back in his day; for instance, that the "pest-houses" or places of reception for those who were plague-stricken, at Venice, had originally been built with windows, which at the time of his visit had been bricked up. "This shows that in the last" (seventeenth) "century, physicians were sensible of the importance of fresh air, and of a free circulation of it in sick wards. A different practice, particularly in the small-pox and the gaol fever, was afterwards adopted by medical gentlemen; but we seem now to be returning to the ancient and more salutary practice. Formerly, also, it seems probable that men did not entertain those absurd prejudices against the free use of water in washing themselves and their rooms, which are now" (1789) "prevalent; for, in several of the old pest-houses, I have observed the marks of a greater attention to the means of gaining plenty of fresh water than has been thought necessary in many of the hospitals built these fifty years."

In the course of some of the heterogeneous and exceedingly curious details which are given in the book in regard to the plague, and the various opinions and practice in regard to its cure, Howard records one case of a sailor who,

in the madness excited by the disease, flung himself into the sea, and from that moment began to get better, and recovered eventually. Probably plenty of water over him was what he wanted most, though he took the remedy rather late.

The lazaretto at Venice having been the oldest, and in some degree the model for others, Howard devotes a great deal of space to a minute description of its operations and method of working. The health-office of Venice was established by decree of the Senate in 1468, in the midst of a very destructive pestilence, and afterwards ordered in detail into its form as Howard saw it. With the exception of the wretched accommodation for those who were detained, he appears to have considered that it worked well on the whole. It is observable that among the rules it was a standing order that all vessels from the Ottoman ports were to be subject to a quarantine of forty days, without any reference to their certificates of health, the Turks being regarded as so absolutely indifferent on sanitary matters that their word could not be taken as of any value. The operation of purging infected goods, as described by Howard, seems to have been very unscientific and tedious; in regard to such articles as wool, yarn, silk, woollen and linen clothes, &c., it simply consisted in unripping one end of the sack containing the goods and causing the porters of the establishment every day to thrust their bare arms in (the arms being bared to prevent any infection fastening on their dresses), and to turn over the stuffs or cloths so as to expose every part in turn to the air, for twenty days; after which the other end was unripped and the same process gone through for twenty days more. If this had any effect upon the infected goods, it must have been to discharge their infectious particles into the air about the lazaretto itself, and render it a veritable pest-house. Beeswax and sponges were purged by putting them in salt water (not stagnant) for forty-eight hours. Animals with wool or long hair were subject to the whole quarantine. Those with short hair were purged by causing them to swim ashore. Probably all that was effected in the forty days of quarantine could be effected in as many hours now.

Howard's observations on the lazaretto he visited led him to plan one himself, of which an illustration is given, and which, like his remarks, shows how far he was in advance of the ideas of his time. He observes, in the first place, that temporary places of detention for such a purpose should be made inviting and agreeable, whereas most of the existing lazarettoes were repulsive in aspect at first sight, and as comfortable and dreary as they appeared to be. He accordingly plans his ideal lazaretto with a bowling-green in the centre of the space it occupies; a canal, connected with the sea, runs nearly round it, and between this and the external boundary-wall are small gardens. In arranging the houses for the temporary tenants he came near to anticipating the pavilion system; for they are all dotted separately over the ground, in symmetrical order, but with spaces between them, instead of being so many rooms in one long building as in the lazarettoes then existing. He has shown pumps at various parts of the ground for pumping up a constant supply of salt-water from the sea. He shows a boom or chain at some distance from the shore, guarded by small forts or towers, and allowing ingress and egress at only one point, this being to prevent ships under quarantine unlawfully breaking away; and within this space are arranged mooring-places for clean ships on the one side and for foul ships on the other side. Howard was very desirous to get the English Government to erect a lazaretto on this plan, and his reasons, under the existing circumstances, are very forcibly put. He shows that our Government then depended for safety on quarantine performed at a Dutch port, by ships bound for England; which quarantine he knew from actual observation was performed and overseen in a very slovenly way; and he points out at some length how in this manner the Dutch not only might introduce (or allow to be introduced) the plague into England, but that they had also by this arrangement great facilities for working the commerce with Turkey to their own advantage, and at our cost,—a matter which he goes into at some length. The subject is interesting now only as showing the thought and consideration brought to bear on it by Howard, who was a shrewd man of the world as well as a philanthropist.

A great part of the rest of the volume is occupied by Howard's account of his second visit to prisons, &c., in England, which he had previously visited and reported on, and the extent to which his recommendations had been acted upon, and the results obtained where they had been attended to. At one place he gives suggestions for the construction of a hospital or infirmary, which are in some respects remarkably modern in their tendency, and show how long it takes for practical ideas to get acted upon after they have first been suggested. The wards are to have no other apartments over them, to be distinct for medical and "surgical" patients, one spare ward over and above the number in use to be always kept unoccupied, each ward to be so set apart as a spare ward in turn; the wards to be washed once a week; each ward scraped and lime-whitened once a year. "The machines at Northwich," he adds, "for supplying the salt mines with fresh air, would be of admirable use in hospitals, especially if situated in close and confined places." These suggestions were made nearly one hundred years ago, he it noted. As a matter of detail, it is curious to observe that water-closets, self-acting on the opening and closing of the door, were in use in the Gay's hospital of that day, and their general adoption is recommended by Howard.

There is far more of information in this book on the then state of sanitation and of medical science in England and Europe. We have picked out only some points of special interest in a book which very probably a majority of our readers are quite unacquainted with, and which bears testimony that Howard was no less a man of sense than a man of feeling.

#### DECORATIVE FEATURES OF THE NEW MUSEUM OF ART AT BERLIN.

THE erection of the new museum in Berlin may doubtless be taken as an indication of an increased appreciation of art by the German nation. In addition to the formation of a collection rich in artistic interest, the promoters of this national work have established a school of art which, according to the *Kölnische Zeitung*, already contains 600 pupils, the professors (twenty in number) being men of eminence, some of whom have contributed to the artistic decoration of the building itself.

Rightly judging that architectural beauty should be supplemented by external and internal decoration of a character in harmony with the objects of the edifice, the designers of the structure obtained the assistance of the most talented artists and workers in Germany in the mural ornamentation of the museum. The result achieved in this direction has an interest apart from that attaching to the building itself, as showing the progress of decorative art in Germany.

Three special features of the work have elicited the particular approval of art critics. The exterior has a terra-cotta frieze-work in its lower portions, and in the upper part rich glass mosaic ornamentation. The principal room has on the upper portion of its walls coloured relief work of a varied character. The general character of the decorations is historical, such allegorical or symbolical subjects as are depicted arising in most cases out of the story, thus silently told, of the rise and progress of art from the earliest ages to our own times.

Heraldic devices appertaining to the various provinces of the empire are numerous in the first-named part of the decorations. The most prominent feature consists, however, of reliefs designed by Siemering and Bruno, executed in terra-cotta. These represent various branches of industry in active operation. Goldsmiths, glass-blowers, basket-makers, joiners, embroiderers, &c., are seen engaged at their various occupations; and the *National Zeitung* suggests that the artists must have selected for their models workmen in the several branches indicated, so lifelike are the attitudes and general character of the figures. Tablets with the names of eminent artists are placed at intervals, and the general effect of the terra-cotta work is commended on account of the contrast it affords to the light red brickwork of the building itself.

The effect of the glass mosaics at the highest portion of the building is described as being striking, the gold ground on which the various portions of the work rest contributing much to the general result. The mosaics have been exe-

\* So spelt in the original.

† It seems that the use of the word "apartment," to designate a single room only, is quite a modern one, and confined to Great Britain.



cated at Venice from designs by the German artists, Ewald and Geeselschap, who have respectively planned the decorations to the left and right of the central point of the building. Roman art is symbolised by a Roman emperor holding in his right hand a figure of Victory. The Byzantine period is represented by a veiled female with a model of a basilica. As a symbol of Gothic art, a female is shown, bearing ecclesiastical objects, and looking devoutly upwards. Another female holds in her hand an image of one of Bramante's domes, as a type of the Renaissance period. Oriental art is depicted in a series of *tableaux*. China and Japan are indicated by figures holding large majolica vases; India by a female from whose hand there hangs a shawl; Egypt by a figure on a throne supported by sphinxes, while as a symbol of Arabic art there is a woman wearing a helmet and carrying a richly-adorned shield.

The decorations of the principal room of the museum are specially commended as exhibiting a marked advance in coloured ornamentation. This plastic work was modelled in *basso-relievo* by Hunderseier and Geyer, two young artists of promise. The subsequent painting in colours was entrusted to Herr Schaller. The general idea of the work is a procession of all nations, bringing to the new museum contributions of *objets d'art* both ancient and modern. The artists named have availed themselves of the wide scope thus afforded to their inventive genius, in a manner which has met with general approval.

The composition begins in the middle of the north side of the room, above the entrance. An allegorical figure representing the goddess of time is here depicted. First in the train comes Greece, her youthful yet powerful representatives bearing the tripod and ornamental vessels as symbols of Hellenic art. Then follow the Romans, mature and earnest men, accompanied by a chariot containing the typical sign of ancient Rome, a brazen she-wolf suckling the historic twins; round the vehicle there being placed brass candelabra to represent Etruscan art. Mounted gladiators precede this part of the display. The representation of Byzantine art is symbolic of the rise of Christianity; the figures of priests bearing a model of the Byzantine basilica forming an effective contrast to the preceding portions of the work. The Crusaders next come upon the scene, and clerical figures bearing ecclesiastical objects succeed them, thus indicating the part which religion took in the artistic development of the Middle Ages. We next see the rise of wood-carving, printing, and other arts. The most prominent position on the east wall is given to the German Renaissance era, the tomb of Sebaldus at Nuremberg being a representation especially worthy of notice. Albert Dürer, Hans Holbein, and Cranach are depicted as leading this part of the procession. Towards the south side of the room the Italian Renaissance is treated with the attention it merits. Ornamental objects of many kinds are depicted, including golden drinking-vessels, rich tissues, Venetian glass ware, &c. Amongst the individuals represented are several of those ecclesiastical dignitaries who (as patrons of Raffaele and Michelangelo) did such good service to the cause of Medieval art.

Thus about one-half of the available space is devoted to the portraying of Western progress. The opposite side of the room is given to a similar treatment of Oriental art. Starting again from the north side, we are first shown the age of bronze, as symbolised by primitive implements of various kinds. In the next group Egypt is represented by a sphinx borne by appropriate figures. Assyria also finds a place in the pageant. A caravan, laden with all the treasures of India, next approaches; while Indian, Persian, Turkish, and other Asiatic nations have their share in the display. China and Japan are then shown; natives of the former country, carrying a model of the pagoda, while in the latter case a collection of porcelain vases is the symbol of the development of art in the far East.

The south side contains emblems of the seventeenth century. The *Jaience* workmen of Delft (with their blue and white vases) carry on the idea suggested by the reference previously made to Oriental pottery. Furniture, carving, and lace are appropriately depicted in relation to the other artistic specialities of the Netherlands. The development of art in the eighteenth century is treated with special reference to the part taken in it by Prussia under her first king. The figure of Wedgwood recalls the progress

made by English ceramic art during his lifetime. The two divisions of this pictorial display meet at a point which contains an allegorical representation of Borussia, together with three females bearing the usual emblems of sculpture, painting, and architecture. A powerfully-built man wielding a hammer is symbolical of labour. Heralds are seen inviting the assembled nations to enter the new building dedicated to ancient and modern art. The conception and execution of this extensive work may be alike commended.

The general idea of the designers of the building has been to adopt, whenever possible, original ideas as to decoration instead of confining themselves to existing types.

#### "CLIMATE IN TOWN AND COUNTRY."

UNDER this title Professor Frankland gave a lecture on Friday evening (the 10th), at the Royal Institution, which, at the conclusion, came round chiefly to the vexed question of London fog and its cause and cure. From some of the conclusions rather roundly asserted by Professor Frankland we must dissent, as we imagine would not a few of the audience present have dissented, had the custom of the Royal Institution permitted of discussion after the lecture. The position taken by the lecturer was that London fog was wholly the product of London smoke, the obviously watery element of the fog being the result of the vapourised moisture in the form of steam, which is always a constituent, though in a small proportion generally, of smoke. This assertion was illustrated by various experiments in the artificial production of fog in glass retorts, illuminated by a strong beam of light, showing the effect of smoke, of dust and dirt, and of the unpurified atmosphere of the lecture-room itself, in producing fog as soon as the temperature of the air in the retort was lowered by rarefaction. That the smoke gives heavier and more murky colour to the fog, and fills it with particles of a pungent and irritating character, no one, of course, will deny; but that the experiments (which were very successfully carried out, and very pretty to look at) established the fact of the sole guiltiness of the smoke in regard to our fogs, we entirely fail to see. Take the case of the experiment with the unfiltered air of the lecture-room,—what does that prove? The air of a comparatively small and not well-ventilated room, closely packed with people, is certainly likely to be pretty full of moisture, which will be precipitated on the condensation of the atmosphere introduced into the retort to be experimented upon; but it seems hardly a fair test to take that as an example of ordinary London atmosphere.

Professor Frankland's view is, in fact, contrary to experience and to historical evidence. We have recently in these columns drawn attention to the evidence which exists that London fog was as marked a characteristic of the climate of our capital two or three hundred years ago as now, although the smoke production might be regarded as really trifling compared with what goes on now; and if we were to reduce our smoke now to the amount produced in the time of Evelyn, we should be considered to have attained almost to the condition of a smokeless London; yet it seems that in Evelyn's time the complaints about London fog were as decisive as now. Frequently we find London enveloped in a thick dun-coloured fog, while the country adjacent is enveloped in a thick white fog. The inference is too obvious for the most uneducated mind to overlook. The basis of the fog is obviously the same both in town and country; the smoke gives to the town section of it a darker colour and more irritant chemical constituents, but that is all. We opine that this basis lies in the extensive prevalence of low and marshy land, and consequently of an atmosphere saturated with moisture, around the neighbourhood of London; the smoke unquestionably makes the infiction worse, and the same state of the atmosphere which keeps the moist fog hanging over London keeps the smoke hanging over it also, so that the two play into each other's hands. But that is a very different thing from crediting the smoke with the whole onus of the infiction.

Professor Frankland's remedy is equally open to question. He closed his remarks by telling his audience that the idea of preventing smoke by better and more scientific grates was practically futile, that "no passage" was written up in that direction, because the expense of fitting up the enormous number of fireplaces

in London with new grates would be far too large for us to suppose that it could be generally adopted, or adopted in any degree sufficient to make a perceptible difference in the production of smoke. Accordingly the remedy was to discard the bituminous coal altogether, and burn only anthracite or coal of kindred qualities. The bituminous coal was to be used solely for the production of gas and other commercially valuable substances extracted from coal; so that we are to be left no choice but between coke and the anthracite and other slow-burning coal for fuel. If this class of fuel is to be burned in open grates, how will Professor Frankland insure us against the very possible deleterious effects on the atmosphere of our rooms of these slow-burning coals, which produce a poison more injurious to the system than any smoke, and which do not always produce draught enough to carry it off as an ordinary fire does? Close grates or stoves purposely constructed are the only really advisable means of burning such coal in dwelling-houses; and the substitution of these for the present grates would, of course, cost as much as the substitution of improved open grates. In either case, the change can be made in time, though not all at once, and we may in time arrive at the general use of grates which produce little or no smoke. It is, if the public choose to do it, or the law to enforce it, a question of reasonable time only. But when this is done, the London fog, we fear, will not be eliminated. Some of its most disagreeable qualities will have been removed, but that is all; and to encourage the public to think that they have the matter of fog entirely in their own hands in this manner is to raise hopes which will not be fulfilled.

The same lecture brought forward some very interesting and entirely conclusive evidence as to the different effect of various substances in radiating and consequently reinforcing solar heat, leading, among other things, to the suggestion of the possibility of producing artificial winter quarters of warmer atmosphere than the average winter atmosphere. Some practical results might be evolved from the working out of this suggestion. It is worth note that by far the strongest reflector and reinforcer of solar heat is found to be white paper, which stands the highest in power in all the experiments that have been made, in various climates and atmospheric conditions.

#### FOUNDATIONS.

A FRENCHMAN might say that when people in this country talk of foundations it is often not the foundations, but the foundation of the foundations that they refer to. In fact, this one word is applied to two if not three different things. It is used to signify the bed or bottom upon which a building is to be reared, and it is also used to signify the first course or courses of stones (termed *founds* in Scotland) of the building itself. This is somewhat confusing. The want of precision of language in using one word in two senses in the same sentence or paragraph may frequently render whole pages of a book unintelligible to the general reader or young student, and for every reason it would be better to have distinct terms for the different things.

The earth or rock in which the bed or socket of a building is formed might be termed the *site* or *bottom*,—the prepared surface upon which the first course of foundation stones is laid might be termed the *bed* of the *foundations*. Methods of giving consistency and stability to this bed, such as draining, piling, concreting, concreting, and asphaltizing, might be termed fastening, strengthening, or preparing the bed. The lowest surface to which the materials for preparing the bed are sunk might perhaps be termed the *formation level*.

It is proper, and all but necessary, that the architect make himself acquainted with the nature of the whole area of the bottom upon which he proposes to build, and some yards round about it. If the area is large he will be wise if he makes a chart of it. He must never take it for granted that any part which he has not tested is similar to that which he has tested; for to do so is often to make a fatal mistake, which will tell either against the proprietor or the contractor for the works. He should use means to obtain a record of the nature and consistency, as nearly as possible, of the whole extent of the ground.

The extent of the area of foundation varies



from that of a pedestal which occupies a few yards, to that of docks and river and sea-walls, which cover acres of ground. There may be great anxiety over the preparation of the bed of a foundation which is small in compass, as in the case of a seat for a large crane intended to lift many tons at a time; or that of a tall steeple which is to hold a great bell, the oscillations of which will periodically shake it from top to bottom. Such objects must have a firm seat on, and fast hold of, the earth, and must be set in a deep socket.

And here I cannot help remarking incidentally on a result of the modern usage of carrying high-level railways through the heart of cities. The passing trains set the buildings adjacent to these railways vibrating all over. Will this incessantly repeated shaking of the houses loosen their joints, weaken their frames, and render them useless and uninhabitable before their time?

The resistance to sinking and spreading in bottoms of foundations varies from that of hard rock, which only transmits pressure downwards (towards the earth's surface), and which does not allow of its own substance being displaced by weight, and that of water, which transmits pressure in all directions, and allows itself to be displaced and weight to sink in it till the forces acting over and through its whole basin come to a balance. It follows from this that the nearer the substance of the bottom on which you propose to build approaches the consistency of hard rock, the less cutting will be required to prepare the bed, and the less deep will the foundations need to be sunk into it; and the nearer the substance of the bottom approaches to the nature of water, the more cutting will be required, and the greater will the depth to which the foundations have to be sunk need to be.

Sand, when homogeneous, makes a good dry bed. Rock often proves a damp bed, allowing water to work in its pores and creep up the walls, and not affording the facilities for draining away that sand and gravel do. In technical books, limestone and gravel are credited with making excellent dry beds. Moss is a first-rate bottom for roads; whenever a skin gets on the surface, the spring of the peat causes roads, whether macadamised or rail, to wear remarkably well. Roads over moss will not cost the tenth part of the sum for repairs that those over rock, sand, or clay do. But for houses moss is a bad bottom every way you take it. It is both unstable and unhealthy. It is treacherous.

The most difficult bottom to deal with is one the parts of which are sectionally different in substance and consistency. One part being, perhaps, as hard as bell-metal, while another lying beside it is as soft as butter. And this case becomes problematical when the bottom is under water, and the line of demarcation between the hard and the soft cannot be exactly discovered and defined. There are two directions in which the sectional parts may lie. They may lie so that the line of demarcation between them is parallel with the sides of the structure about to be reared, or so that it forms an angle with them more or less acute; the latter case being the worse.

When obstructions are met with, it is an important matter that the architect should be able to decide what amount of opposition should be considered of sufficient gravity to cause him to alter his plans. Plans should not be altered for the sake of a trifle. On the other hand, man cannot work against nature, nor accomplish impossibilities.

The processes to be used in dealing with imperfect and unstable bottoms, in order to make a reliable bed for foundations in them, are to be found detailed in all comprehensive books on architecture, civil engineering, and building economy. The great error into which people are apt to fall, is not in the adoption of method, or even in choosing the best method, but in carrying out the method they have adopted to perfection. When there is deficiency in the solidity or the homogeneity of the bottom on which you are to build, whatever remedy you may appoint to make good the deficiency, you must never rest nor leave it till you have attained your purpose, and made a reliable bed for the foundation. Every new foundation he has to lay, is a new study for the architect.

The great advantage of using a coffer-dam in laying foundations under water is, that it enables the eye to see the bottom and all the work that is done. The strata on which the foundation is to rest, and each stone that is laid, are thrown

open to vision, and what could be better than that?

Several writers have directed attention to mistakes which have been made at times, in spreading layers of concrete for the strengthening of the bed. The intention in laying down *béton* or concrete is that the whole of the mixture should, when it has solidified, form one fastened mass, compacted like the leather of the sole of a shoe. To bring this about the shivers and gravel must be bound with some cementing material, such as mortar or grout (made either of lime or cement, sand and water). This cementing material should permeate the whole mass of shivers or gravel equally and thoroughly. Care must be taken that it does not run out of the mass altogether, as also that it does not run through it, so as to desert one part and accumulate in another. This is no unnecessary injunction. I have seen the washing out of a portion of many barrels of cement from the shivers into which it was poured. It was in the case of a large iron cylinder, placed in the centre of a river to sustain a bridge, and the interior of which was to be filled with concrete. The water of the river got through the seams of the cylinder, and came out deeply coloured with cement. A large sheet of water was so coloured every tide. In the end it could not be known how much cement remained in the cylinder, nor how it was distributed among the shivers, nor how much of the contents attained the consistency of *béton*, how much remained shingle, notwithstanding the work being done at great cost. The inspector should try to make sure that the proper quantity of cementing material is expended on the shingle and well distributed throughout it, and he can never be wrong before beginning to build upon the *béton* to cause a little grout, made with hot lime or Roman cement, to be run over the surface, to fill any interstices that might possibly remain.

In building a bridge over a river where there is already a bridge, it would be well to bear in mind that the projectors of the first bridge probably selected for it the best site that could be got, and that the site chosen for the second bridge about to be built, is most probably an inferior and less secure position, and that therefore the new structure should be better guarded and more carefully founded than the old in order to make it as secure. A wise man builds his bridge at the ford, a fool builds his at the ferry.

It must ever be a matter of surprise that what was the new bridge over the river at Ayr (Barr's "new brig") having given way at the foundations of the pier, a second new bridge erected in its place, and only two or three years old, is now likewise already showing signs of insufficiency and weakness at the same part, and is causing no end of anxiety to the trustees who have the charge of it. But it is sufficient to remark on this point that the architect having satisfied himself of the depth to which he is to sink foundations which are to be exposed to water, such as sea and river walls, and piers of bridges, should always mark his formation level a few feet lower. Having fixed the level of the bed of his first course low enough for perfect safety, he should calculate upon placing it a few feet lower still. Here, if anywhere, he ought to work upon a broad margin and make assurance doubly sure.

The heaviest part of a building should rest upon the solidest part of the foundation walls. In the handsome steeple of Free St. John's Church, Glasgow, I have observed that the keystone of an arch has been made the foundation of a tall buttress. This is not only bad in principle, but it is displeasing to the eye.

As the foundation of a building is its base, to spread it out is not only conformable to the rules for safety, but also to the precepts of taste.

Whoever wishes to lay foundations pressing equally on their bed, and exactly and neatly, at the same time must make use of powerful implements. It may be said, in a general way, that the instruments and tools with which a builder works at foundations should be larger and stronger than those with which he works at the superstructure in proportion as the pieces of which the foundation is, or, at any rate, ought to be, composed, are greater and heavier than those of which the superstructure is composed. There can be no question as to the great advantage that suitable and powerful implements put into the service of a sensible workman give him. They invest him with extraordinary powers to carry on his job exactly and expeditiously.

Not only should the stones put in foundation walls be the largest put into the building, but

if there be any difference in the specific gravity they should also be the heaviest per cubic foot, the heaviest for its size being, in most instances, the strongest too. Stones, as a general thing, are comparatively strong or weak, according as their specific gravity is high or low.

If I now propose to architects and still more to engineers, that they should make the foundations of all their structures, whether seen or unseen, handsome things, I think I hear them retort, "What do you mean? Teach your grandmother! Away, stick to your last!"

The ancients had that idea, however, which they, no doubt, took direct from Nature, that nothing is handsome which is not handsome throughout, and that if you would have anything like a perfect structure, the unseen as well as the seen should be carefully and tidily shaped. "Thorough," a word upon which Lord Macaulay threw some contempt, was their motto; and, besides, it seems not out of the way to suppose that any one who loves beautiful figures and fine forms would incline to draw all the parts of a design handsomely from bottom to top, that he would not begin at the bottom with a hideous foot when he proposed to end at the top with a graceful head, and that his foundation works would be designed to conform to the pattern of the rest of his building, nor to suppose conversely that he who was careless in producing and displayed no taste in designing his foundations would be but a slovenly architect or engineer throughout, and not much to be depended on.

If you ask me what I consider a handsome foundation building, I would give as my example the crypt of Glasgow Cathedral. Perhaps you might reply to me, "Is that a foundation building at all?" My answer to this would be, "Is the crypt of St. Paul's, London, a foundation building? I prefer the crypt of Glasgow Cathedral to the crypt of St. Paul's." To this you might perhaps reply, "But are not the crypts of the churches you name superfluous, and rather what might be called superfluous examples of foundation works?" To this my answer would be, "That is as you think. My purpose is to pull up the prevalent notions regarding the dignity (not to say the importance) of foundations, not to drag them down."

If the architect have the eye of a painter; beyond that, if he have the soul of a poet, his imagination will revel among the sunken and gloomy recesses of foundation buildings, even as the novelist glazes over the midnight city, the spectral river, and the starlit bridge. Across his heart, running in hot and cold jets, will shoot the elastic lines of the impetuous Byron:—

"Take Lemnos lies by Chillon's walls,  
A thousand mazy feet below."

Without the alternation of deep gloom and brilliant sunshine, the world would appear frivolous and unattractive, and the architect, as well as the painter and the poet, will find a certain pleasure in diving down the lanes of deepest shadow in pursuit of beauty ever flying before.

But paramount to that, if in his daily walk he seeks, as he may do, to make his works a faint imitation of Nature, he will find in this model nothing misplaced or misleading to imitate, no false theories or mistaken deductions, no slovenly or reckless practices. Her foundations are always beautiful and strong. W. Y. B.

#### ENGINEERS AS STATESMEN.

It is with a very just and natural pride that some of the Continental journals point to the eminence recently attained in public life by several gentlemen belonging to the profession of civil engineer. The most remarkable instance, perhaps, is that of M. Simon Bavier, who has been elected President of the Swiss Confederation, or, as he is more correctly called, President of the Swiss Federal Council. M. Bavier was born in 1825, and studied engineering at the Polytechnical Schools of Stuttgart and Karlsruhe. He was formerly engaged in the construction of some of the Italian railways, as well as in the service of the Swiss Government. He is the author of an excellent technical work entitled "The Roads of Switzerland."

Further examples of engineers proving successful as statesmen are to be found in the new French Ministry. No fewer than three of the members of the Freycinet Cabinet are by profession civil engineers. They are the Minister-President, M. de Freycinet himself, and his colleagues, M. Yarrow, Minister of Public Works, and M. Tirard, Minister of Commerce.



# "OLD FULHAM BRIDGE,"

OTHERWISE CALLED "PUTNEY BRIDGE."

THIS was the title of an extremely interesting paper read before the London and Middlesex Archaeological Society, on Monday evening last, by Mr. J. F. Wadmore, A.R.D.A. The author commenced with some general observations on the changes that have taken place during the last century and a half in the aspect of London from the Thames, and in the aspect of the river itself; and went on to say that it might, perhaps, surprise many people to inform them that the old timber bridge between Fulham and Putney (shortly to be removed) was now the oldest existing bridge in the metropolis over the Thames, and that it was erected with the intention of supplying an immediate temporary want until its place could be occupied by a more permanent structure. Although erected as far back as the year 1729, it had usefully served the purposes for which it was designed, while two stone bridges of later date,—Westminster and Blackfriars,—had become ruinous, and their places were supplied by more recent structures. Since Putney Bridge was opened for public traffic, no fewer than twelve other bridges had been erected over the river to supply the needs of London, viz., Westminster (in 1760), Blackfriars (1769), Battersea,—another wooden structure,—(1771), Vauxhall (1815), Southwark (1817), Waterloo (1817), Hammersmith (1827), London Bridge (1831), Chelsea Suspension, or "Victoria" Bridge (1853), Albert,—or "New Battersea,"—and Wandsworth Bridge, to say nothing of Hungerford Suspension Bridge (removed to make way for the Charing Cross Railway Bridge), and the various railway bridges now crossing the river. Having briefly glanced at the history of Fulham and Putney, and shown that a ferry existed at this point of the river from very early times, Mr. Wadmore went on to say that the necessity of some more certain and better means of communication between the two banks of the river was recognised by Lord Essex, who, when in command of the Parliamentary forces in 1642, threw a bridge of boats over the river to enable him to follow up Charles I., who then lay at Kingston, having retreated from Brentford, crossing the river by Kingston Bridge. There was reason to suppose that this bridge of boats was made use of up to the year 1647, and possibly later. The convenience and facility which it afforded while it remained were too great to be lost sight of or forgotten, and accordingly, in 1671, a Bill was introduced into Parliament for building a bridge over the Thames from Fulham to Putney. Its supporters appear to have met with the uncompromising opposition of the citizens and Corporation of London, and the Bill was lost, on a division, by 67 to 54. The arguments used on the occasion were preserved in Grey's "Debates," under date April 4, 1671. Mr. James, the member for London, stated that the Bill would "question the very being of London. Next to pulling down the borough of Southwark, nothing can ruin it more. All the correspondence westward for fuel and grain and hay, if this bridge be built, cannot be kept up. The water there is shallow at ebb. London requires a free passage at all times." Mr. Walter defended the Bill, observing that "at Paris there were many bridges, at Venice hundreds." Sir Thomas Lee wisely remarked that it would make building at the west end of the town all the better. Sir William Thompson said the erection of the proposed bridge "would make the skirts (through London) too big for the body. The rents of London Bridge, for the maintenance of it, would be destroyed. It would cause sands and shelves, and affect low navigation, and cause ships to lie as low as Woolwich." Colonel Stronde said that in no case were all the bridges of a city built at one time. No city in the world so long as London had only one passage for five miles. Mr. Boscawen remarked, "If a bridge at Putney, why not one at Lambeth? and more?" Sir John Bennett said the Corporation would agree to the bridge at Fulham if they were thereby secured from another bridge at Lambeth. Mr. Love, the Lord Mayor of the year, was, however, of a different opinion. "If," he said, "cards go over, the City must be destroyed." In the result, the Bill was thrown out, as before said, by a majority of thirteen votes. There was every probability that the Act eventually obtained for building the bridge was mainly carried by the aid and influence of Sir Robert Walpole (the centre lock was long known as "Walpole's lock"). There

was a story current that one evening Sir Robert was returning from Kingston (after he had been in attendance on his royal master at Hampton Court), to take part in an important debate in the House of Commons. When he arrived, hot and in post-haste at the ferry, to his utter disgust and dismay he discovered that the tide was down and that the ferry-boats were laid up high and dry on the opposite shore, nor was there a ferryman to be seen. It was in vain that he and his servant shouted till they were black in the face and hoarse in the throat. The ferryman, Tories to a man, were carousing with mine host of the Swan at Fulham, and regaling themselves with beer and tobacco, while they secretly enjoyed his discomfiture. All Sir Robert could do was to ride on, leaving his maledictions on the ferrymen. These were no idle threats. The Act for the building of the bridge received the royal sanction on June 8, 1726 (12 Geo. I.). The importance with which the project was regarded might be inferred from the number and influence of the illustrious list of noblemen and gentlemen (110 in number) who were appointed commissioners to carry out the Act. With a quaint irony which gives point to the story before mentioned, the first meeting of the Commissioners was held on July 25th, 1726, "at the sign of the Swan at Fulham," where a small but useful tavern where passengers waiting for the ferry could resort and find refreshments. The proceedings must have been conducted in the open air, as it was not possible that accommodation for the sixty-eight noblemen and gentlemen who then attended could have been found in the humble hostelry. One of the resolutions passed at this meeting (at which there were present, among others, "Nicholas Dabois, Master Mason; Thos. Ripley, esq., Cont' of H.M. Works; and Will Kent, esq., Master Carpenter") was, "That such a bridge be built as may supply the present exigency, and be useful for the building of a more substantial bridge, as there may be occasion." A committee, consisting of the greater number of the commissioners present was appointed to receive proposals for the erection of the bridge and to report thereon. The committee gave instructions for a survey to be made of the river, showing the different places where a bridge might be erected, and Mr. Thos. Ripley reported on three places: "Firstly, from Putney to Mr. Gray's land at Fulham; secondly, from the east corner of Fulham Dock; thirdly, from the east corner of Mr. Priddlewell's gardens to the carpenter's yard at Fulham." The committee having considered the three, selected the first, where the width of the river between the banks was 780 ft., with 18 ft. of water at high tides and 6 ft. at low. Three designs for the bridge were next submitted for the approval of the committee,—the first from Mr. Thos. Ripley, the second from Mr. John Price, and the third from Mr. William Halfpenny. Mr. Ripley proposed to build a bridge 23 ft. wide and 780 ft. long, the centre look to have 17 ft. of waterway above the highest tides; the piles to be 15 in. in diameter, shod with iron and driven 6 ft. into the bed of the river. If built entirely of fir, he estimated the cost of construction at 8,000l., including pavements (abutments) at the ends of the bridge; that the annual repairs would cost from 50l. to 60l.; and that the work could be completed in two months and would last for from twelve to fourteen years. He further added that he did not think that any wooden bridge, though of oak, would last above thirty years. If the piles were of oak the cost would be 9,000l. The roadway was to rise 9 in. in every 10 ft., and the bridge, when erected, "would be useful in the nature of scaffolding for the erection of a stone bridge." Thomas Ripley was born in Yorkshire, and is said in his early days to have kept a shop and coffee-house in Wood-street, Cheapside. He was admitted to the freedom of the Carpenters' Company in 1705, and by the interest of his patron, Sir Robert Walpole, obtained the appointment of clerk of the works at the King's Mews. He subsequently became Chief Carpenter, then Controller of H.M. Works; and lastly, Controller-General of the Works, Buildings, Gates, and Bridges, as well as Conductor of the Royal Progress. His principal works were the carrying out of Charles Campbell's design for Houghton Hall, Norfolk, for Sir R. Walpole; Wolston House, Norfolk; the Admiralty, Whitehall; and many other works and buildings. He died at his official residence at Hampton Court, February 10, 1768, and was buried in the parish church. His name was mentioned by Pope in connexion with the erec-

tion of the proposed bridge in a somewhat disparaging way,—

"Who builds a bridge who never does a pile,  
Should Ripley venture, all the world would smile."

Mr. John Price submitted a plan and section of a bridge, to be 20 ft. wide, with a total length, including abutments, of 852 ft. from high-water mark, to be divided into nineteen bays, from 45 ft. to 30 ft. wide, so as to allow 585 ft. of navigable water-way, to be 12 ft. 6 in. high above high-water mark. He was of opinion that the bridge might be built for 8,600l., and completed within nine months. With oaken piles, 18 in. in diameter, as he proposed, he thought the bridge would stand for fifty years. The annual repairs were estimated at 100l. per annum for the first seven years, and 200l. per annum afterwards. Mr. William Halfpenny submitted a plan for a bridge to be 24 ft. wide, with nineteen bays or openings, to be 32 ft. wide each, and to be 16 ft. above ordinary and 12 ft. above the usual high-water mark. He proposed to build the bridge wholly of oak, and estimated its cost at 2,800l. He reckoned that it would take about a year and a half to build, and would stand about thirty years, costing about 500l. for repairs. Objection appears to have been taken to the plan submitted by Mr. Price, on the ground that the bearings between the piers were supported by a king-truss on either side of the bridge, that the middle would be necessarily weak, and require a cross-piece, which would throw the whole weight on the king-post. Mr. Price fully explained to the committee the nature of a truss, and endeavoured to throw discredit on the plan submitted by Ripley, by saying that the piles could not be driven down as proposed by him without splitting to pieces. A plan and model for a bridge of boats were also submitted, which, it was stated, could be finished in two months, and would cost 5,000l., the repairs being estimated at 300l. per annum. In this bridge of boats there were to be two openings of 24 ft. each for barges, and thirty of 12 ft. each for wherries. The committee finally came to the conclusion that Mr. Ripley's plan should be adopted, and oaken piles used. The feet of many of the original piles now exist, although most of them have been scarfed with other timber, as the decay has been between wind and water, about halfway up. The committee then invited tenders for the erection of the bridge. Three were submitted,—firstly, from Mr. Thomas Hall, carpenter, for finishing the bridge by Midsummer Day, 1727, at a cost of 7,500l., one-third to be paid when one-third of the work was completed, one-third when two-thirds were finished, and the remainder on the completion of the work. Secondly, Mr. Thomas Phillips offered to undertake to finish the bridge in two months, if required, for the sum of 6,698l.,—one third to be paid at the beginning of the work, one-third when half was done, and the remainder when the bridge was completed. Thirdly, Mr. John Meard, carpenter, undertook to finish the bridge in two months for 6,650l., payments to be made as in the proposal of Mr. Phillips. The committee agreed to accept Mr. Phillips's tender to build the bridge, with oaken piles, for the sum of 6,698l., he giving security to keep the work in repair for twelve years, accidents by fire and damage by barges alone excepted. Further tenders were then entered into with Mr. Joseph Andrews, mason, for stone-work amounting to 1,756l., and with Mr. John Mist for roads and paving at 6s. per yard square, he keeping it in repair for twelve years for 50l. per annum. These matters being settled, the committee proceeded to consider the rights of the ferry that on the Middlesex side being held of the Manor of Fulham (of which the Bishop of London was lord), while that of Putney was held of the manor of Wimbledon, whereof Sarah, Duchess of Marlborough, was lady. Mr. Ripley's plan appears to have met with some outside criticism other than Pope's, notably from Mr. John Gregory and Mr. Thomas Beal, who suggested remedies for certain defects which they thought they detected in the design of the bridge. In a petition which they addressed to the Commissioners, they say,— "When the ice is frozen hard to the piles, they standing naked, as usual, with the small ends downwards, when the tide comes strong under the ice it will probably heave up the bridge, and loosen the ribs in the ground, and rack the braces and framing at the top. Then there may come a sudden thaw, and the shoals of ice which will be brought down the river with the land-floods will drive hard against the bridge, and it



being top-heavy, and before loosened and racked by the frost, it is, in our humble opinion, in great danger of being overthrown. Therefore, to prevent such a casualty, if we are employed in it we will take such a method as we have put forth in the following proposals." This method appeared to be the fixing of the larger ends of the piles downwards, "to be turned in with an engine," as "the butt-ends had most heart," and, tapering upwards, the piles would be the better able to resist the ice; also, to "warp" the piers on every side with planking. The petition concluded with the following words,—"We being the root of this contrivance, it is to be hoped you will not permit any branch of it to be grafted into any others' proposals." Financial and legal difficulties having arisen, partly out of the extent of the claims made by those interested in the ferry rights, some delay was caused, and other designs were invited. There were three responses from Captain J. Perry, of Rye, who, after saying that he was then engaged on works connected with the harbour, &c., offered to build a bridge "by a new method not yet practised in England." Secondly, one Richard Newsham offered to construct a bridge "for a small sum of money, to last longer and better than any others"; and, thirdly, Mr. J. Goodyear submitted scantlings for a bridge, but declined to be an undertaker and accept a mortgage of the tolls as payment. At a subsequent meeting Mr. John Price sent in a model for a stone bridge, which he estimated to cost about 45,000*l.*, and eventually the Commissioners, by deed of assignment, made over the undertaking to thirty gentlemen, amongst whom were the Earl of Halifax, Sir Robert Walpole, Sir Matthew Docker, baronet, and Sir Charles Wager, knight, who had agreed to subscribe the sum of 1,000*l.* each. The first meeting of the proprietors was held at the Lottery Office, Whitehall, on Nov. 27, 1728, when several models and designs were considered. 1. The model and design for a timber bridge previously submitted by Mr. Ripley. 2. Mr. Price's model of his proposed stone bridge, already mentioned, "together with the model of a timber one of the same kind with that which Julius Cæsar built over the Rhine," and estimated to cost 20,250*l.* 3. Mr. Halfpenny's design for a timber bridge, previously laid before the Commissioners. 4. Mr. Goodyear's design for a timber bridge. 5. A model of Captain Perry's proposed bridge. 6. Two several designs for timber bridges by Sir Jacob Ackworth. All these were referred to a committee, and they reported in favour of Mr. Ripley's proposal, if the piers could be built of moor-stone at a cost of 15,000*l.* Mr. Ripley did not procure any estimate, but stated that the cost would be about 16,500*l.* Mr. Ripley's design was therefore rejected, and that of Sir Jacob Ackworth accepted. The width of the centre opening of the bridge was to be 23 ft. wide; there were to be four openings, each 25 ft. wide, and all the other openings were to be 15 ft. wide each. Eventually, Mr. Phillips undertook to carry out the work for 9,600*l.* To complete the approaches to the bridge it was found necessary that about 200 square feet of Patney Churchyard should be purchased, and a faculty for this was granted in 1730. A careful examination of the minutes of the earlier meetings of the proprietors shows that although Sir Sir Jacob Ackworth's design for the bridge was selected, it was materially modified in execution. Its construction was superintended by a committee of eight of the proprietors, of whom Mr. William Cheselden, the eminent surgeon, appeared at one time to take the chief part. The interest shown by Dr. Cheselden in the construction of the brick arches and abutments, and arranging for the toll-houses, gave no doubt some colour to the statement made by Faulkner, in his "History of Fulham," that Dr. Cheselden gained his experience in architecture while practising as a surgeon in Chelsea Hospital, "which enabled him to design a bridge standing on so many wooden legs." At a meeting held at the Lottery Office, Whitehall, July 2, 1730, the following resolution appears to have been passed:—

"Resolved, as the bridge is built entirely according to a scheme and principles laid down by Mr. Cheselden, and as he has been very serviceable in directing the execution of the same, that the thanks of the proprietors be given to him for the advantages which have been received from his advice and assistance, they being of opinion that no timber bridge can be built in a more substantial and commodious manner than that which is now erected."

The first carriage that passed over the new

bridge was that of H.R.H. George, Prince of Wales, Nov. 22, 1729. With sundry repairs from time to time, and with certain alterations of late years to meet the wants of the river traffic, the bridge has continued in use down to the present day. Under the Metropolitan Toll Bridges Act, 1877, the bridge was opened free to the public on the 30th of July, 1880, by H.R.H. the Prince of Wales, the Metropolitan Board of Works acquiring the rights of proprietors of the tolls for the sum of 58,000*l.* Subsequently, the Metropolitan Board of Works obtained an Act giving them power to pull down the old bridge and the aqueduct erected by the Chelsea Waterworks Company in 1849, and to erect a new bridge combining the utilities of each structure.

By the courtesy of Sir Joseph Bazalgette, Mr. Wadmore was able to give a few particulars of the new bridge, which will shortly be commenced. The proposed site of the new bridge is about 150 ft. higher up the river than the old bridge, so as to obtain better gradients on the Fulham and Putney sides by making the approach from the former direct from the termination of the present High-street, passing in the rear of the vicarage, and through the garden. The new bridge will be constructed entirely of granite, with five segmental arches, the centre one having 144 ft. clear waterway, with a height of 20 ft. above Trinity high-water mark. The total length of the bridge between the abutments on either side will be 700 ft., with a width of 44 ft. The total clear waterway will be 628 ft. The cost, with the approaches, will be not less than 200,000*l.* The water from the Chelsea waterworks will be carried under the footways in four pipes of 24-in. diameter, and two of 12-in. diameter, three being placed on either side.

A brief discussion ensued, in the course of which the chairman (Mr. J. G. Waller, F.S.A.), the Rev. Hawley Clutterbuck, and Messrs. George Lambert, F.S.A., Alfred White, F.S.A., G. H. Birch, A.R.I.B.A., and S. W. Kershaw, F.S.A., took part, the last-named speaker referring to the ancient ferry from Lambeth Palace to Westminster. Until within some seventy or eighty years ago the water-stairs and water-gate existed. The ferry was much used, and is mentioned in Archbishop Land's "Diary." In the library of Lambeth Palace there is preserved an interesting document, dated 1701, signed by the Lord of the Admiralty, and bearing the Admiralty seal, exempting the Archbishop of Canterbury's bargemen from impressment into the king's service.

Mr. Lambert afterwards read an interesting paper on "Pewter."

#### THE CONSTRUCTION AND ARRANGEMENT OF THEATRES.\*

It is fully well known that the existing arrangements of sheet iron or wire curtains fail almost without exception in the hour of danger. The value of wire curtains, moreover, remains problematical. The committee have, therefore, come to the conclusion that only a permanently acting, perfectly fireproof screen, which keeps out the gases of combustion, will offer sufficient security. By this they desire to say that the curtain must be a fireproof screen running in an iron casing, which, because always in use, shuts off the stage at once and unfailingly from the auditorium in case of fire, and by means of which the fire may be localised on the stage, which must be sacrificed under any conditions. Supposing such a screen to exist, one half of the theatre—the auditorium—might be preserved perfectly intact, a condition never before attained. But by this means a very much greater advantage might be obtained, namely, that, in future, fires in theatres would occur without a loss of life. The greatest guarantee would be offered by the knowledge of the public that there is no danger, in consequence of which the excitement and anxiety to get to the doors, easily explained under present circumstances, would disappear, and the theatre be emptied in an orderly manner. This condition of a permanent fireproof curtain has been specially treated by Mr. Carl Pfaff, and the committee are able to refer to the result obtained by that gentleman as a practical solution of the theoretical problem proposed by them. At the request of Mr. Pfaff, this matter was submitted to a sub-committee for examination, who have dealt with it

\* See p. 155, ante. Report of the Committee appointed by the Austrian Society of Engineers and Architects (Vienna).

in detail. Their report is published in an appendix.

The theatre being thus divided into two perfectly isolated parts, there remain only those arrangements to be considered which provide for the safety of those who, in case of fire, are present in either half. As regards the stage, where a fire is almost sure to originate, it would be necessary to separate it completely and fireproof from the rooms used by those engaged on the stage. This object may be attained by enclosing the stage itself on all sides by fireproof walls; in this manner the fire would be confined within that space, and it might be allowed to burn itself out, the efforts of the fire brigade being directed towards rescuing persons engaged therein. At the same time, the roof for this part of the theatre ought to be of very light construction, and the whole well ventilated, so as to permit the flames to find a ready outlet. From this point of view, and looking upon the square formed by the stage as the seat of the fire, it would be advisable to provide the three walls not turned towards the auditorium with as many fireproof passages as there are floors; the dressing-rooms, wardrobe-rooms, and other accessories to the green-room, which would require daylight, would be ranged around the stage, outside the fireproof walls. On each side of the stage at least one flight of stairs for the corridors ought to lead into the open. Should a back stage be required, it would be necessary to establish a fireproof communication between the corridors on both sides of the stage above it.

In the auditorium, which may be supposed to be constructed perfectly fireproof at least in its communications, the latter are of first importance. The passages ought to be constructed with regard to the number of persons assembled in the various parts of the building; but provision ought also to be made to guard against undue crowding in cases of sudden evacuation. The task imposed upon the architect from this point of view will induce him to design the building in such a manner as to dispose of the crowds, which vary in different parts of the house, most effectually. He must divide them into as small bodies as possible, each of which should be able to reach the open as quickly as possible, by the shortest route, without encountering obstacles, and without coming into collision with other parties leaving the house. If we examine existing theatres from this aspect, it will be found that they supply that accommodation in very rare instances to the extent required. Leaving old theatres quite out of the question, in which much arose from accident, and a greater part from other considerations than those here mentioned, it is only too often found that demands are made upon a given site of limited dimensions which render it impossible for the architect to provide communications corresponding to the number of spectators in the sense here pointed out. But most of the theatres are faulty in that there is a want of direct ventilation.

As theatres are intended only for illumination at night, it is frequently thought that daylight may be dispensed with. But where daylight is absent, fresh air may be procured only at a heavy expense; and yet it will not be denied that fresh air cannot be dispensed with in theatres. The fact alone, that most of those who have perished during fires in theatres have been suffocated, ought to prove the necessity of throwing as much daylight as possible into the communications. But the want of fresh air shows itself also in another way. Let us examine the obstacles which oppose themselves to a plentiful supply of air under such conditions. In most theatres, corridors, stairs, and vestibules are grouped round the auditorium, and are again surrounded by other rooms receiving their light direct. Under such conditions, the hall formed by the auditorium and the passages attached thereto not only supply increased danger in case of fire, but they also become a source of various diseases for the thousands of people who are nightly crowded together there in a heated atmosphere. As a plentiful supply of air in theatres cannot be given by artificial ventilation without great expense, natural ventilation offers itself as a ready means of solving the difficulty. If once the principles of safety and sanitation, hitherto neglected, are thoroughly recognised in the construction of theatres, and more particularly in the part in which the public assemble, old-established habits will give way and improvements will follow as a matter of course.



Hitherto the communications in theatres have been planned on a system of centralisation; its place will have to be taken by decentralisation. With this view, a sufficient number of staircases and passages connected with them will have to be provided, in the first place; in the second place, however, account must be taken of a suitable division of the communications corresponding to the movements of people in the theatre, the largest number of staircases being placed in those parts where the public are congregated in largest numbers. The definition of these requirements by itself presents great difficulties. What is meant by sufficient communications? How many doors of exit are to be provided for a certain number of people, and in what proportion ought the number and dimensions of staircases to be to the number of doors and the people present respectively? It will be difficult to give exact figures, as various changing factors, such as the length of the passages, the form and winding of stairs, the width and steepness of steps, exert a great influence upon the rapidity of the movement of bodies of people. The true solution of these problems in each special case will depend upon the architect, who will have to take due note of such points as are contained in his instructions. He will have to keep to the programme laid down for him as nearly as possible, as a matter of course; but he will do well to adapt his conditions as much as possible to the classic theatre, with its well-devised system of numerous stairs and passages. We do not mean to indicate that he should simply take the classic theatre as a pattern, and entirely break with our present system of boxes. The communications required must be made conformable to the plan of the theatre; but it seems desirable, for this very reason, to refer to the classic theatre, because the same advantage achieved by ancient architects ought to be attained in the modern theatre.\* If full cognisance is taken of these conditions, changes in existing arrangements and the elaboration of a new system will follow by themselves. It would be unadvisable to lay down hard and fast rules, but the following particulars may well serve as a guide, referring, as they do, to practical requirements. They would, of course, not be acted upon in the case of grand staircases, nor apply to dispositions made for special comfort.

(a) The communications for the various tiers, each of which ought to have at least two sets of stairs, should be independent of each other. They should be in the right proportion to the number of people which each tier will accommodate, and be as short as possible.

(b) The communications should be on a more extensive scale in proportion to their length,—that is to say, the upper tiers ought to be provided with more staircases, because they contain a larger number of people.

(c) A larger number of staircases of moderate width (say 6 ft.) is to be preferred to a less number of very broad stairs.

(d) The turnings should be uniform, and should be easy. Steps and landings should be on a uniform scale. The height of rise should be of the same proportion throughout.

(e) Single steps should be entirely avoided.

(f) Direct staircases are to be preferred to spiral ones.

(g) The passages destined for the public must in no case be intruded upon by the cloak-rooms. The latter may be constructed along the passages for the purpose which they serve, but they must have their exits placed in such a manner as to enable people using them to leave them without entering the general stream.

(h) All doors must open outwards: a police regulation made at Vienna long ago.

If communications were constructed as above pointed out and other precautions adopted, crowding dangerous to life and limb would be an impossibility. The masses would, by natural impulse, try to gain the doors, and even the largest theatre might be emptied in a very few minutes. Even in the case that smoke were to enter the auditorium and passages,—which, however, is to be prevented by other measures,—the stairs or passages leading to the open air might be at once ventilated by opening the windows or smashing them, and the danger of suffocation would be avoided. Absolute darkness would also be prevented, as such passages would be partially, however slightly, lighted from the street lamps.

In summing up what has been stated,

\* The references in our columns to the classic theatre appear to have reminded inquirers in all parts of Europe of the lessons to be learned from it.—Ed.

the committee express it as their opinion that the greatest guarantee for the safety of the theatre-goer is offered by the construction of a sufficient number of staircases, simply and practically arranged, and corresponding to the number of spectators and their distribution in the theatre, as well as by the possibility of ventilating them and the corridors connected with them. They, however, deprecate all makeshifts in the form of balconies, ladders, iron safety stairs, and other precautionary measures, excepting so far as they may be necessary for improving the condition of existing theatres. The same principle which the committee have laid down for the iron curtain applies also to the other arrangements. They must possess stability, and the public must be acquainted with them by their daily use. It is only in this manner that the public will acquire confidence in them, which can only be expected if a conviction of the perfect safety afforded by them gains ground. The behaviour of the public, however, who, in the hour of danger, must help themselves, will be of greater value than all measures of safety devised for cases of emergency, and which generally fail. To make a virtue of necessity was the beginning of all art. We may be convinced that also in the case given necessity will lead in the right direction.

The preceding inquiry has resulted in the formulation of a series of principles which might in the future become rules for the construction and arrangement of theatres. In continuing to test those conditions, a number of determinations of detail may be evolved from those general principles which may increase the safety and comfort of the public. The committee, considering that at the present moment it is only required to set things generally right in this highly important matter, think that they may properly exclude from their labour every detail which would result, as a matter of course, from the due observance of generally valid principles. It is true that there are other points of inquiry not at all or only slightly touched upon here, which are of essential importance in the construction of theatres: such as their warming and ventilation, lighting, water-supply, and the extinction of fires. Notwithstanding their great weight, the committee thought it better to abandon a closer treatment of those questions, for the following reasons. The far-reaching claims which may be made in the construction of theatres upon the arrangements for warming and ventilation, as well as the effect which they may have upon fire-risks,—while, on the other hand, that peril may be greatly diminished by suitable contrivances for ventilation,—could hardly be defined in such a manner as is required by the object which the committee have in view. They think, on the contrary, that the more minute treatment of this branch of the inquiry may be safely left to the investigation of the many experts of our society who have made that department of technical science their special study, and who are, therefore, best fitted to deal with the reforms required. But the question of lighting is of such extreme importance that the committee deem a brief reference to it necessary.

Two reasons suggest themselves for entering into the lighting of theatres. In the first place, the present mode of lighting the stage is the principal cause of fire; and, secondly, it must be most imperatively insisted on that the lighting of the auditorium and the communications must, even in the case of fire, never wholly cease. It may be remarked with regard to the first point that the great number of gas-lights fixed on the stage, often very closely to or between easily inflammable materials, raise the temperature on the stage generally to a very high point, which, especially by radiation, reaches a very dangerous local intensity, and completely prepares for ignition the already very easily ignitable materials forming the scenery, &c. It is here that the danger lies which is inseparable from a stage lighted by gas, and it is, therefore, highly desirable that the stage, in its principal parts at least, should in future be lighted by electricity. The committee are not at present in a position to make definite proposals for a particular system of electric lighting, but they expect from the progress with which electrical engineering is continually surprising the world that the want here expressed will soon be met. A solution of this question may all the sooner be expected, the more managements of theatres are willing to lend a helping hand to experiments, to which they are

most earnestly invited. Although, on the one hand, electric lighting must be decisively recommended as highly desirable for the stage for reasons of safety, the lighting of the auditorium and communications may be left as at present. In that part of the theatre electric lighting may heighten the effect, and may also reduce expense, but would not increase its safety.

Whatever system of lighting may be adopted for the auditorium and its approaches, it must never be confined to a single source of light and exposed to complete extinction by accident. It must be expressly emphasised that this demand is made, not only for the case of a calamity, but also for daily routine; for the sudden collapse of the lighting arrangements in a theatre otherwise perfectly in order and filled with spectators would, without further aggravating circumstances, prove by itself a lamentable catastrophe on account of the confusion caused thereby and its consequences. The committee are of opinion that an emergency system should be entirely done away with, and that there must be a supplementary system of lighting. The committee understand by this an arrangement for lighting the auditorium and its communications by means of oil lamps or candles, which forms such a large part of the regular lighting by gas or electricity that it cannot be dispensed with also for daily use, but is necessary for obtaining the full lighting effect under all circumstances. This supplementary system of lighting would thus be placed under the most efficient control,—that of the public. Care should be taken that managers of theatres do not hide the absence of a well-acting, but, to them, inconvenient, supplementary system by a too brilliant lighting by gas or the electric light, and thus withdraw it from the control above pointed out altogether. On the other hand, it would appear perfectly admissible to light that part of the theatre exclusively by oil lamps or candles. On stairs and in passages, in vestibules and lobbies, the lights serving the supplementary system ought to be ventilated from outside. Entrances and doors must be distinguished by recognisable lights belonging to that system. As long as a theatre possesses, besides the supplementary system, one for gas, the pipes of the latter leading to the stage, the green-room with its passages, and the auditorium with its approaches, should not be connected with each other, but should have independent communications with a main, and not be interrupted by any intermediate contrivances.

As regards all further measures for the general safety, especially the extinction of fires, the committee are of opinion that they would exceed their function were they to treat that question. But they are perfectly convinced that the competent authorities who have hitherto administered such measures would be best able to suggest desirable reforms.

The principles above stated might form a guide in the construction of new theatres. In adapting old theatres, those fundamental maxims should be applied as far as possible. The same principles should also serve as a guidance in framing or amending existing building regulations for theatres. How far by legislation alone the safety of the public may be provided for, and how far it may be commendable to determine the construction of theatres by law,—in order not to restrict the liberty of technical science and art too closely, and to avoid making the object legislated for appear merely the expression of existing regulations, as is the case already in many other departments,—requires careful consideration. But under all circumstances, it appears to them of the utmost necessity to encompass theatres by a number of measures of safety of a technical nature, and to co-operate in insuring to theatres at least that proportion of safety which is provided in the working of railways and steam-ships. But even in existing theatres provision must be made for affording an increased degree of safety to the public, by adapting them to the necessity of the case.

This object might perhaps best be attained by the appointment of a central commission of experts at Vienna, which ought to examine all plans for new theatres or for adaptations of existing ones, and to pronounce upon them.

In concluding their report, the committee think it incumbent upon them to add a few general remarks, which have reference to the Austrian system of public architecture, and which may serve to throw additional light upon



the question treated. The committee have drawn attention, to the best of their knowledge, to the evils connected with theatres, for they felt that the means for improving existing shortcomings could be provided only by acknowledging and fearlessly stating the truth. As it might appear from what has been stated as if the architect were responsible for many of the defects exposed, the committee consider it their duty to direct attention to the conditions which exonerate the Austrian architect from the responsibility for numerous mistakes, errors, and omissions in the construction of buildings, or very nearly hold him blameless in such matters. It has often been pointed out, and with regret, that the architect in the Austrian Department of Public Buildings enjoys no independence; he is merely the subordinate of administrative officials. The architect, or engineer, is used only where and how he may be considered fit to be called in. He does not enjoy the authority such as the exercise of technical instructions requires, nor is he permitted the initiative for independent dispositions which may appear to him advisable. He is the organ whose advice is asked in each individual case, without being sure that it will be acted upon. In most important technical matters it may happen that the view of the layman prevails over that of the expert.

If the present high point of excellence of architecture in Austria is here referred to, this fact must be supplemented by the statement that this eminence in detail is the result of a decided art influence, while there is an absence of great architectural principles and of a generous care for architectural interests. Having regard to this much-felt want and to the abnormal conditions existing between the tasks imposed upon architecture and the organisation of the Austrian Department for Public Buildings, the committee feel bound to insist most strongly upon the necessity of reform, long asked for, in that department, and upon the appointment of a superior authority, consisting principally of experts, with independent powers. In carrying out such reforms, an organisation would be called into existence which would formulate a number of useful regulations, and which should be specially referred to in this case.

In all countries where architecture is cultivated, each completed building is placed under the supervision of its architect, as well as each public edifice under the care of a duly qualified expert, who appears to be responsible for its preservation and appropriate use, and for all architectural alterations and arrangements. This is not considered necessary in Austria, and the work is handed over to a subordinate technical official or even to a layman. In this manner its preservation, which depends upon the permanent supervision of its architect or a qualified successor, is not only considerably jeopardised, but the most valuable buildings and monuments are sometimes exposed to accident from a technical and art point of view. There is also the risk that well-meant dispositions and arrangements do not come into action at all, in consequence of the absence of the necessary care, or are misapplied; and just this fact might be fully illustrated by the experiences gained at the burning of the Ringtheater. From what has been stated, it is self-evident that the sole security for carrying out in a reliable manner the reforms required in Austrian theatres consists in regulating the last-mentioned question.

The best and well weighed advice acquires value only in its correct application. As long as there is a disinclination to confide technical matters to men specially trained for the purpose, and as long as the latter are only looked upon as the tools of other authorities, the question here treated, or any other technical matter, will never be satisfactorily solved.

The above report is dated Vienna, January 15, 1882, and is signed by Herren J. Dörfel, F. Fellner, H. von Ferstel, E. von Förster, Haberkorn, Th. von Hansen, Baron Haesbauer, H. Helmer, C. Pfaff, and Fr. Schmidt, all well-known names and prominent members of the Austrian Society of Engineers and Architects. It was read at the meeting of that society on January 21, and unanimously adopted.

Mr. Thomas Chatfield Clarke, F.R.I.B.A., has received a unanimous invitation from the Liberal Association of Poole to be a candidate at the next election.

## COFFEE HALLS.

It is interesting to the student of history to remark, as a phase of the present times, how many men of note and position are throwing themselves with great energy and great talent into every scheme likely to promote the onward march of progress to ameliorate existing abuses and to urge the adoption of measures of sanitary reform. Among these men, whose name is legion, are members of both Houses,—scientific, literary, medical men,—who devote the scant leisure left them by all-absorbing duties to the furtherance and spread of their theories. The very names of the men on some of the committees are in themselves a guarantee that the project, be it what it may, is at least worthy of receiving a trial.

The immense importance of the *mens sana in corpore sano* is now such a received fact that the ever-increasing necessity of drawing the masses from the slough of despond,—the lower world of our great city,—lies in getting the body healthier by purer air, and food good and more plentiful because cheaper. The mind naturally takes a healthier tone, giving the poison its antidote by offering more intellectual pleasures, not taking their pleasures from them,—forcing them to look from the pictures they have been accustomed to gaze on to those these gentlemen hold up. It is by these means they are hoping to attain their end.

The "way is long," the wind of opposition, of ingratitude, of non-comprehension very difficult to struggle against; and it is not to be wondered at that many of these modern Jack-the-giant-killers, who began the fray with apparently indomitable courage, get weary of well-doing, disgusted, and eventually lay down their arms. One would have to be more than a Sisyphus in these modern times,—to have more than the strength of ten to always hold on to the end.

Two of the pet schemes most in vogue at this moment towards attaining the desired end are cheap coffee-restaurants for workmen and coffee music-halls. In the first they are supposed to be able to get a dinner for sixpence; in the latter, entertainments of all sorts in the music-hall style, but devoid of much of the rather dreary fun and ribaldry that too often characterises some of them; and in the case of the Royal Victoria Coffee-hall, to which I shall more particularly advert, as being the largest and, consequently most important, a concert of a very superior order is given once a week, where professional of repute give their aid gratuitously, and amateurs of note also assist. It affords accommodation for 2,800 spectators, and who, on looking at the vast building packed from floor to ceiling on Thursday, the 9th, when the Prince and Princess of Wales, ever gracefully foremost and eager to further any good work, went down to judge for themselves, and to show, by the fact of their presence, their approval of a movement meant to be conducive to the further well-being of the people, could not but admit it was a gratifying sight to Miss Cong, the energetic and indefatigable secretary; to Lord Mount-Temple, Lord Brassey, and other equally well-known members of the committee, to note the vast, the decorous, and, I will add, the appreciative audience their efforts had gathered within these walls, and whose hearty enthusiasm when they joined in the chorus of "God save the Queen," was a convincing proof loyalty was not, at all events, out of date in the New Cut.

What a different spectacle to that presented to our mind's eye by Charles Knight in his *Penny Magazine*, of 1846. "Look at our theatres! Look at the houses surrounding them! Have they not given a taint to the very districts they belong to. The Coburg Theatre, now called the Victoria, and the Surrey,—what are they? At Christmas time, at each of these minor theatres, may be seen such an appalling amount of loathsome vice and depravity as goes beyond Eugene Sue, and justifies the most astounding revelations of Smollett." Again, Mr. Walford tells us that the "Victoria Theatre was called the Coburg out of compliment to Prince Leopold of Saxe Coburg, the husband of Princess Charlotte; the first stone was laid by proxy in 1817, and the theatre opened on Whit Monday of the following May. It is situated at the corner of the New Cut, near what was called the Marsh Gate,—a turnpike; and probably the building of Waterloo Bridge,—commenced in 1811, completed six years later,—led to its erection. The foundations of the theatre are entirely composed of

the stones of the old Savoy Palace in the Strand [near which the Art-Union of London is now located], and which were cleared away in order to form Lancaster-place. The builder of the structure was a clever French carpenter, called Cabanella, who also invented a peculiar kind of roof, named after him."

In July, 1833, the title was changed to that of the Royal Victoria, in commemoration, it is said, of the young Princess Victoria and her mother, the Duchess of Kent, having visited it. There are also other interesting records connected with it. In 1830 Edmund Kean was paid 100l. for performing there for two nights. Booth, Cooke, Liston, Joe Grimaldi, Buckstone, Benjamin Webster, and G. V. Brooke, trod its boards. It numbered among its scene-painters Clarkson Stanfield; and in 1834 the great violinist, Paganini, performed here for one night,—his last appearance in this country.

Yet the Victoria enjoyed a doubtful reputation for some years; the audience, which had begun by being respectable, changed into a mob who sat in shirt-sleeves, cracked nuts, called the actors by their Christian names, and pelted them with orange-peel and apples, so that it was hardly safe for a respectable West-end to enter. However, with the march of time and education, these things again altered, and in 1871 the audience of the New Cut assembled to bid farewell to their cherished home of melodrama, and though composed of the rougher classes, were as decorous as need be. The piece given was the same the theatre had opened with in 1811, "Trial by Battle; or, Heaven defend the Right"; and when Mr. Cave announced in a pathetic manner, "the curtain will drop for ever on the Victoria Theatre," and it fell, a mournful-voiced bare-armed young man in the front row of the gallery, summed up the case thus, "Ah! the poor old Vic! Pass the 'arf-and-'arf, 'Arry.'"

Well, it is the question of the "arf-and-'arf" that has principally led to the establishment of these coffee-halls. Few want to deprive a hard-working artisan of his glass of ale at his dinner or supper, but they wish to prevent him spending the whole of his leisure time in a public-house,—a place he cannot take his wife or his daughters to, and where the temptation of an occasional sip ends too often in confirmed intemperance; and it is well known half the crimes committed come, not from the fair use, but the abuse of drink. Feeling that some places of amusement were needed where men could take their wives and children to enjoy an evening of harmless recreation, where they could get good coffee, good tea-cakes, and cheap sparkling beverages, these places, of which the Victoria seems to be chief, are being started. On ordinary nights the rate of admission is extremely moderate: on the concert nights it is dearer (a fact, I personally should imagine, was rather a mistake). There are some seats at higher prices for those in a higher grade of society,—a necessary thing, for it is a curious fact that places where only persons in their own position go are not popular with the people; they like to see the "swells."

If, then, the impetus given to the movement relaxes, or were eventually to fall through, it would not be the fault entirely of the class it is meant to benefit. There is not always a sufficiently hearty co-operation on the part of the general public. The danger to any new scheme lies so often in its being taken up with amiable enthusiasm that gradually gets cooler, or it is worked in too dilettante or amateurish a fashion, not on a sufficiently commercial basis; sometimes the failure is merely to be attributable to the want of sufficiency of funds to be able to weather and tide over that narrow isthmus that lies between non-success and success, and which almost always has to be traversed. The expenses are sometimes beyond the receipts, as in the Kensington Coffee Tavern, where the rental is 200l., and the gas-bill, chiefly for cooking purposes, 160l. per annum; so that, it is feared, if they cannot find enough annual subscribers to pay the rent, they will have to close.

Then, I am told the numbers are not many of small drinkers or total abstainers who reside permanently in any neighbourhood, and the working classes are constantly migrating. Sometimes, too, the restaurants which began by giving excellent dinners at 6d. deteriorate, or the men are kept waiting,—an important point when they have only a given time for their meals. Then the public-houses are trying to vie and surpass in their coffee and tea their rivals. And as the making of good coffee is one



of the essential elements in the success of this undertaking, this is a point that should be closely looked after. In France coffee is so excellently made, and at such a cheap rate, that it is the universal and favourite beverage.

It is against all these adverse circumstances that the promoters of the present scheme will have to contend. A mere outsider, and in no way mixed up in the movement myself, it appears to me to hold the elements of so much good to thousands, as to deserve the good wishes and co-operation, not of one class in particular, but of the general public.

CARLEON.

#### ST. JEAN-DU-DOIGT.

The church of St. Jean-du-Doigt, near St. Pol de Leon, in Brittany, is a singular and very interesting example of Breton architecture. It consists of a nave and aisles under one external roof, a well-proportioned tower with a graceful leaden spire, porch, ossuary, and sacristy.

We have frequently described what the Germans call "Hallenkirchen," or hall-churches; that is, churches covered externally by one roof, with their interiors arranged like a hall, divided into three parts or aisles by columns, and the church of St. Jean-du-Doigt may be taken as a Breton reading of the same class of building. There are, however, very marked divergences from the German treatment to be noticed in the Breton church, some of which spring from the fact that, whereas all the German churches of this class are vaulted, St. Jean-du-Doigt is covered with timber roofs; yet it is not quite clear that vaulting was not originally proposed. If the building was from the first intended to be covered by timber roofs, it is rather singular that the crown of the pier arches should be kept down to the level of the eaves of the roof, which leads to the necessity for a great height of bare wall over the crown of the arches, a very ugly feature, and one which quite destroys the idea of a hall-church. The Germans avoided this by keeping the vaulting all below the great tie-beams of the roof, and constructing the timber roof itself in one span, quite independent of the rest of the building. The English would have avoided it by covering the nave and aisles by three distinct external roofs, either high-pitched and gabled east and west, as at the Temple Church, or by a high-pitched gabled roof over the nave and lean-to plans over the aisles.

Now each of these plans has its drawbacks. The Breton plan, as we have already pointed out, necessitates a dreary blank space of wall above the pier arches, which is certainly enough to condemn it; the defect of the German plan is its loss of the whole roof-space internally, and the vast quantity of timber required for the construction of the roof. Though, on the other hand, these enormous roofs have a very dignified and picturesque effect, nevertheless, there is certainly something unsatisfactory in finding a church some 60 ft. lower inside than it is outside.

The English ways of getting over the difficulty, although they avoid the faults of the German and Breton arrangements, are not without drawbacks of their own. The plan, for instance, adopted at the Temple Church necessitated two very long "valley gutters," which are apt to get choked up and leak, causing the ends of the rafters to rot, and the walls to get injured, and, where there is much snow, the objection to this treatment is a very serious one. The other English method, that of placing a high-pitched roof over the nave, and two nearly flat ones over the aisles, overcomes all these difficulties, but is exceedingly ugly in effect. The old Dutch church in Austinfriars is an example of this treatment. The most sensible plan of covering in such a church is that pursued at Bristol Cathedral, where both nave and aisles have nearly flat roofs. It is, however, not free from faults: such a vast flat roof-space does not protect the building well from wet and snow.

The Church of St. Jean-du-Doigt possesses many features of interest. The east window, for instance, is a curious example of what, for want of a better name, we must call "Starform tracery." The large east window, with a rose or wheel introduced into the head, is quite a feature of Breton Gothic churches. Another local peculiarity is the wooden roof. It is the most elaborate one we know of in France; and is adorned with a great deal of rich carving, but anything less like the wooden roofs of our English churches could scarcely be conceived. Several of the altars in the church of St. Jean-du-Doigt are ancient. They are all of the same

simple design, with the piscina cut into the side of the back part of the altar. One of these altars is shown in our view. There seems to be evidence that the church was intended, in the first instance, to have been much larger than it is at present; the great jambs of what was probably intended to be a chancel arch are shown in our illustration. The footstone of the building was laid in 1440, and an inscription on the porch records its consecration in 1513. We have, in a previous number, described the interesting gateway, fountain, charnel-house, mortuary chapel, and ossuary which adorn the churchyard of St. Jean-du-Doigt.

#### STONE CHURCH, KENT.

We add to the illustrations of this most interesting Early English church, given in our last number, a plan of the building, and the transverse sections, as promised. An account of the church will be found on p. 173, ante.

#### COLTHURST.

This illustration represents the first sketch for some additions to Colthurst, prepared for Lord Justice, then Sir John, Holker. Colthurst is a few miles from Olitheroe, in Lancashire, but is on the Yorkshire side of the river Ribbles.

In execution, during the year 1879, the plan indicated by the accompanying sketch was altered, the oriel window being placed at one side, instead of at the gable end of the billiard-room, which occupies the upper floor, and being faced by an "oriel fireplace," so to speak, on the opposite side. The house has been furnished with taste by Messrs. Gillow. The architect is Mr. Edward J. Tarver.

#### WESTGATE-ON-SEA.

BUILDING operations at Westgate-on-Sea within the last two years have been brisk. As many of our readers know, this agreeable watering-place received, some few years ago, a notoriety through the recommendation of a well-known physician, and it was laid out at great expense by the then owners of the estate, with sea promenade and wind-protected gardens. One peculiarity of it is that the houses fronting the sea have to be built as detached residences, no semi-detached houses or terraces being allowed. The result is that for picturesque of buildings, as apart from any natural beauty of foliage or undulation of soil, this little seaside resort is noticeable.

The building illustrated was erected for Mr. Frederick Davis,\* of Apley-rise, Isle of Wight, and was planned with special reference to his comfort,—thus, a bed and dressing room, with bath-room and w.c., were placed on the ground floor, so that an invalid might be on a level with the reception-rooms, and not have to climb or descend stairs, and that a good view could be obtained of the sea and the promenade from the windows of the bedroom. A large covered verandah was also provided, with an octagonal projection, to be used as an external tea-room in summer time, in order that the occupiers might enjoy the sea breeze and be shaded from the sun at the same time.

The accommodation on the ground-floor consists of drawing-room, library, dining-room, serving-room, lavatory, and w.c., besides the special bedroom suite mentioned above.

The dining-room and library have folding-doors, so that they may be formed into one large dining-room at pleasure,—33 ft. long,—when the house is full of visitors.

The lowest floor is about as much below the level of the garden as the ground floor is above it. The accommodation on this basement story consists of kitchen, scullery, pantry, larder, butler's room, servants' hall, and the usual domestic conveniences. There are five bedrooms and a bath-room on the first floor, and four bedrooms, a housemaid's closet and a large box-room on the attic floor. From the principal bedroom on the first floor there is a way on to the covered verandah, which is seen at the upper level in our view.

The house was built by Mr. J. G. Naylor, of Rochester, from the drawings and under the superintendence of Mr. Lewis Solomon, of Gray's Inn-square, and no clerk of works was employed. The building, with inclosure walls, &c., cost a little under 2,800*l*. The external walls

\* Although this gentleman bears the same name as Mr. Edmund Davis, who formerly owned most of Westgate-on-Sea, and who advertised it so extensively, we are informed he is no relation to the latter.

are hollow, bonded with iron ties, and rest on a concrete foundation above the chalk, which is disclosed immediately under the top soil. The tiles and terminals were supplied by the Aylesford Pottery Company; the stoves and ranges by the Falkirk iron foundry; the iron railing, stairs, and vane by Cottams; and the mantelpieces by Tagdon. Gas and water are supplied to the house by the local companies, and a rain-water tank is provided for water for domestic purposes. Hot and cold water are laid on throughout the house. As yet there is no main drainage at Westgate-on-Sea, so the house is drained into a cesspool sunk over 30 ft. deep into the chalk.

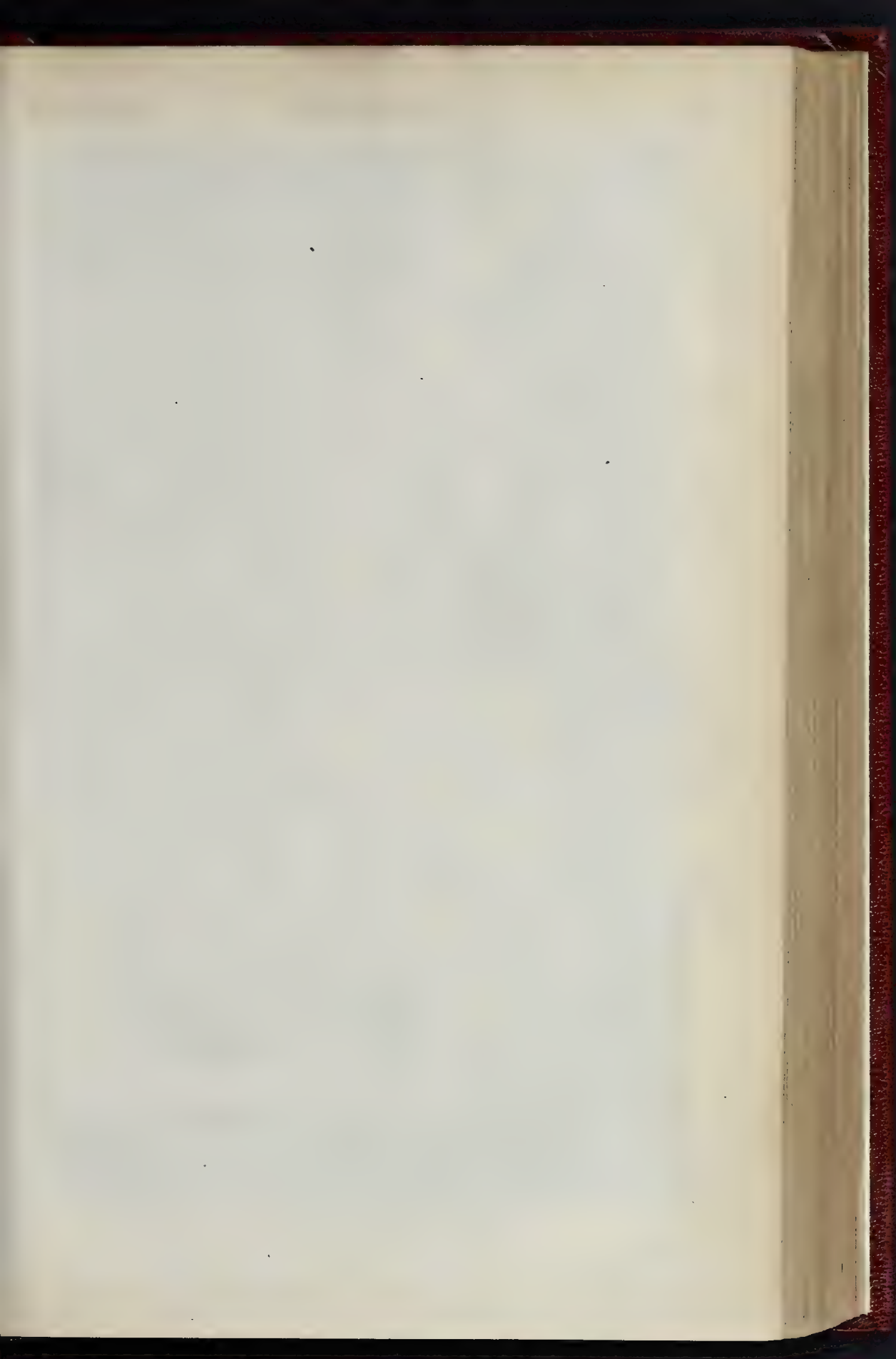
#### THE MUTILATION OF STATUES, AND THE MEANS OF DETERRING ITS REPETITION.

WITHOUT allowing the instinctive feeling of reverence either for public monuments or for any specimen of the art of that date which fetches so high a price in articles of the fabric of the silveramith, to blind us to the fact that Bird's statue of Queen Anne to the west of the cathedral church of St. Paul's was not in itself one of the finest ornaments of the metropolis, we cannot omit to express detestation of the offence which has destroyed what appearance of regal dignity had been left by the weather. We cannot but feel that many of those who have been concerned in the erection of some recent public monuments in London ought seriously to debate with their own consciences how far they may not be accessory to a public and growing sense of disgust, which may take form in some lamentable outbreak. We have ourselves known excellent men, and good artists, who have expressed a very ardent desire to fill their pockets with stones, for the demolition of some of the stained-glass windows which disfigure noble buildings not 100 miles from the scene of the recent outrage.

The attack on Queen Anne's effigy, we are told, is the work of a madman. Truly it may be so. But we have to point to a great danger which is menacing the world. Men are getting too much disposed to put forward the plea of "madness" as the excuse for crime. Whether it be the disfigurement of a monument, or the destruction of human life itself, vicious or foolish people raise the cry, "The man's mad; take no notice!" Now, if these pseudo-philanthropists have their way, all to be excused on this plea.

A man is so passionate, so idle, so incurably vicious, that he must be mad. Therefore—therefore what? Therefore, we say, make the law which punishes wanton outrage so plain, so certain, and so severe, that no one who is trusted to go at large can doubt what will befall him if he allows his tendency to madness to urge him into crime. The present cry tends, as far as it has any effect, to diminish the self-control of the eccentric or the violent. If a man suffer under that heaviest of all calamities, the total loss of reason, no doubt he must be cared for and treated as if he were a bodily, instead of a mental, paralytic. But if he be sufficiently removed from either idiocy or frenzy to be allowed to go about at large, if he understands that fire burns, that water drowns, or that food comforts, so can he understand that law punishes malignant offences. If he can see the sequence between cause and effect in other respects, and guide his conduct by that perception, so will he guide it if the latter sequence is indubitable. Not alone then for the public safety, but for the protection of those unfortunate who vibrate on the frontier of mental incapacity or of self-indulgent passion. Humanity demands swift, certain, and sure punishment for wanton mischief. It is bad enough when, in the heat of passion, one disputant strikes another a fatal blow. There are moments when even the ordinarily well-conducted lose self-control. But even at these moments the fear of a sharp penalty,—and most certainly if it take the form of the infliction of personal bodily pain, comes in wonderfully to the aid of the reason. In cases where there is not the excuse of passion, the influence of this check is even more certain and more desirable. "He knows when he is whipped," was once adduced as a proof of the intelligence of a very small child. If this test were applied, with drum-head rapidity, either to the defacer of monuments or to the unprovoked assailant of human beings, the first vigorous use of the cat would probably be, for a long time, also the last.

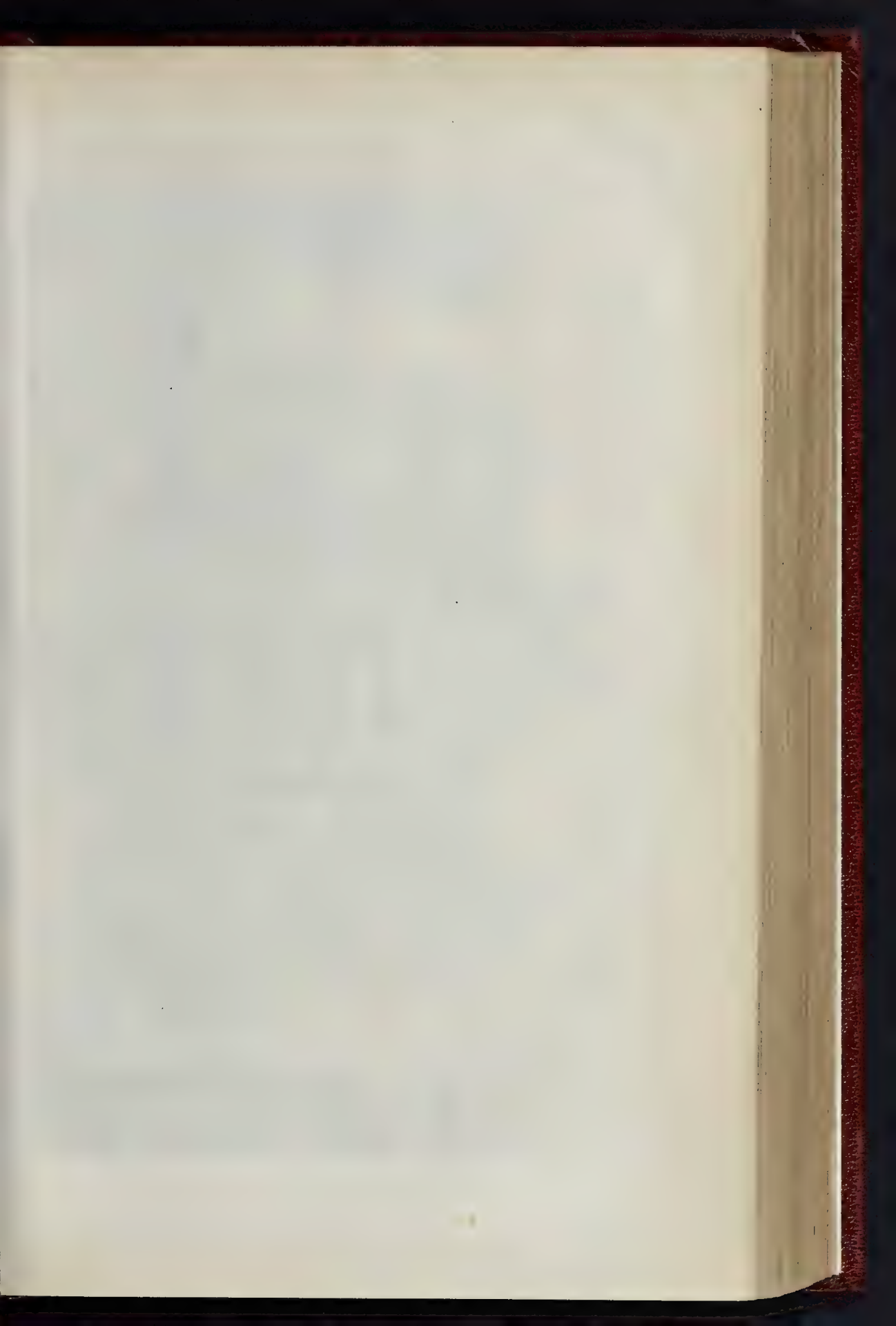




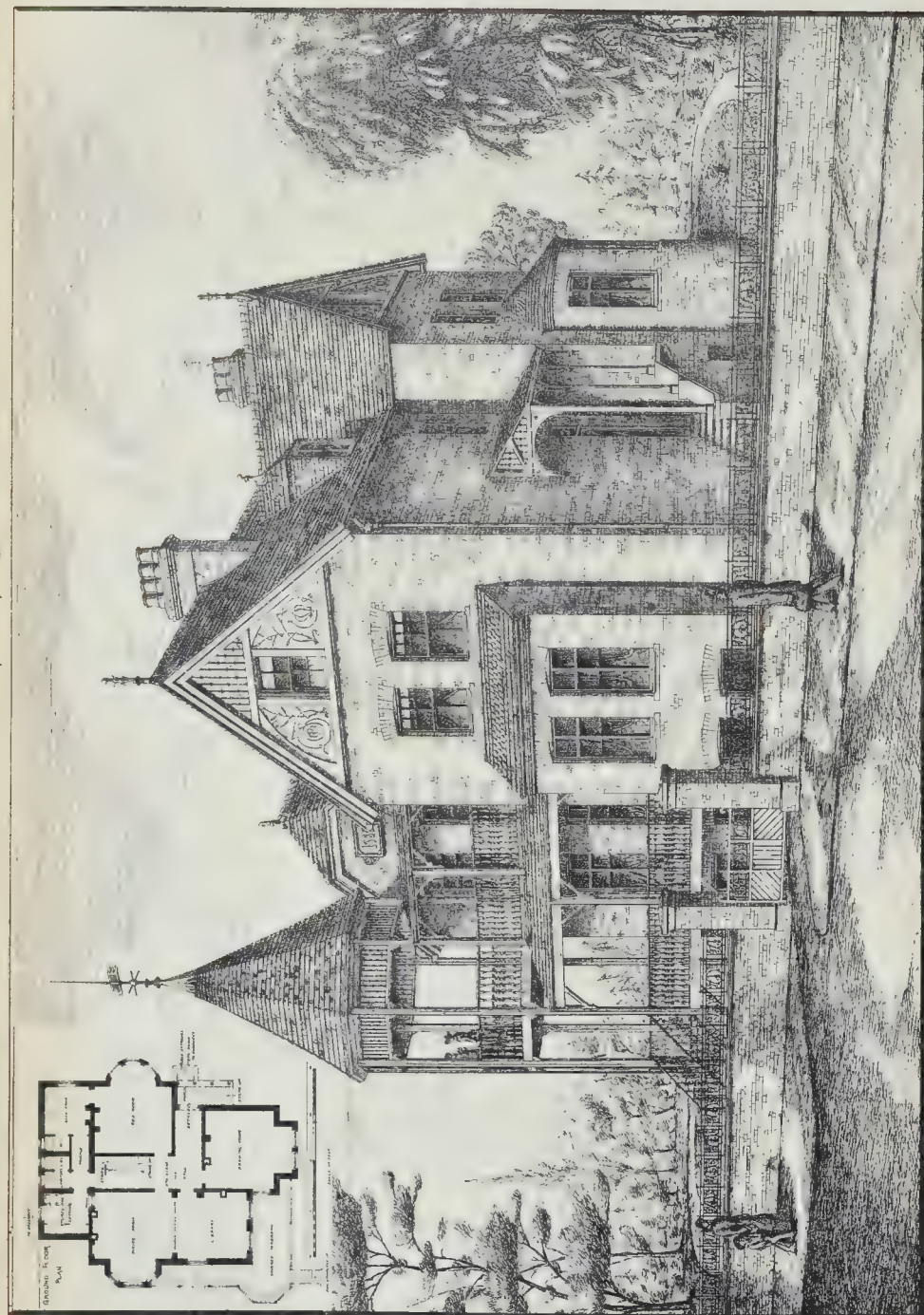


CHURCH OF ST. JEAN-DU-DOIGT, BRITTANY.



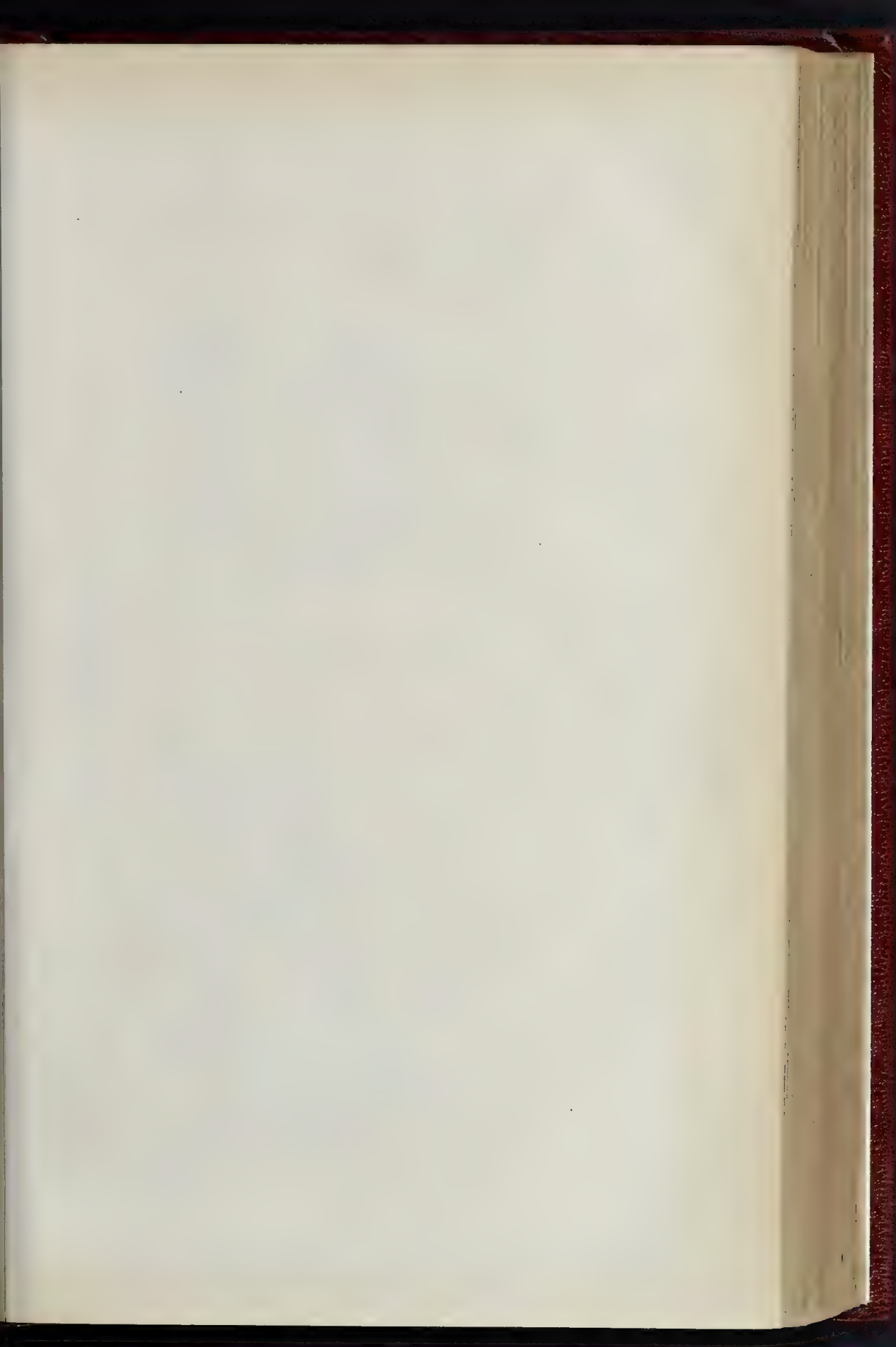


THE BUILDER, FEB. 18, 1882



TURRET HOUSE, WESTGATE-ON-SEA, THANET.—MR. LEWIS SOLOMON, ARCHITECT.







Signatures of the

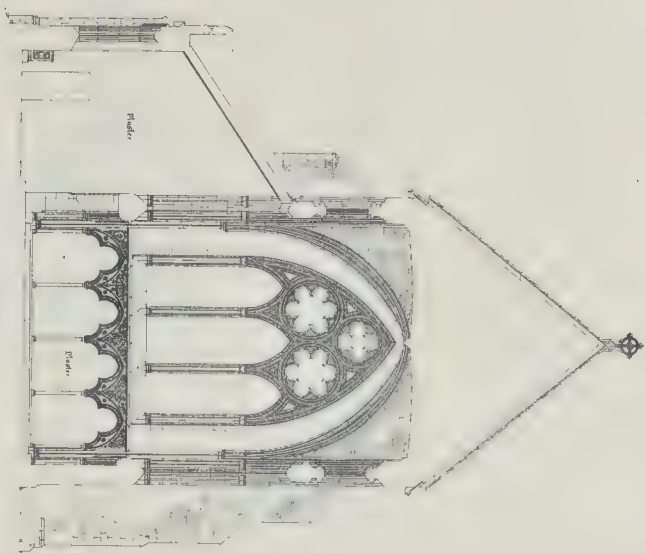
ROYA, - (C)EMY SILVER MEDAL AWARDED 1881

*[Faint handwritten notes and signatures]*

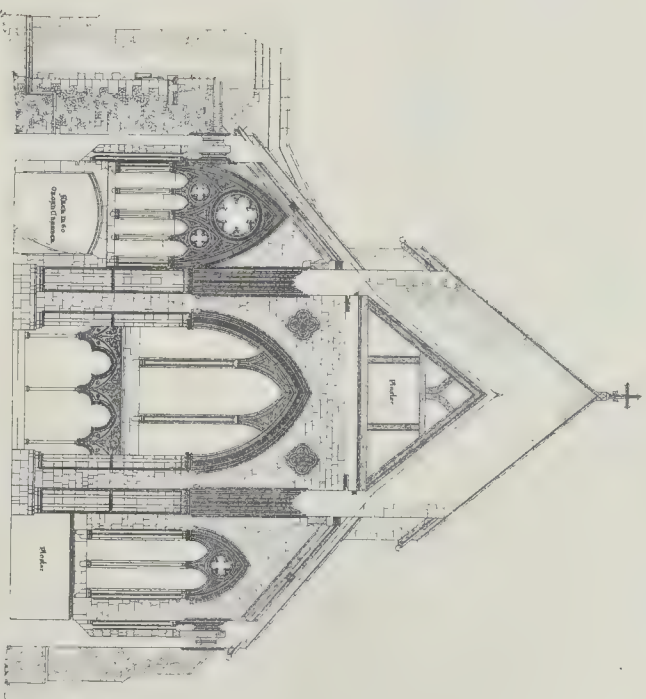


THE BUILDER, FEB. 16, 1882.

# CHURCH OF S. MARY, STONE KENS



EAST END OF CHURCH OF S. MARY, STONE KENS



INTERIOR ELEVATION OF CHURCH OF S. MARY, STONE KENS









A CORNER OF COLTHURST, THE SEAT OF LORD JUSTICE HOLKER.—MR. EDWARD J. TARVER, ARCHITECT.

Wymann & Sons Printers





# SKILLED AND AMATEUR LABOUR AND THE ROYAL COMMISSION.

In the correspondence that our article on certain normal and informal aspects of skilled labour has elicited, and the remarks it has given rise to through other channels, the writers have nearly all wandered somewhat astray from the true bearings of the subject or subjects. Personal experience is to some extent useful, but no one workshop or locality is sufficient in its examples to be accepted as a safe basis to build upon. The personal contact of outsiders with workmen, of outsiders who have no practical or technical knowledge themselves of the workshop ways of operatives, or the methods of labour that generally obtain in the practice of their handicraft, cannot count for very much, though this does not import, at the same time, that these outsiders are not intelligent and observant men who are interested in the subject that calls forth their remarks. We have often during the last twenty years spoken of the value of technical or industrial education for the elevation of the workman and the character of his workmanship, and long too, before the least echo of the question was heard from out the circle of the City Guilds. Indeed, more than a decade since, we roughly mapped a scheme or plan of action which we commended to the attention of those said guilds, and looking back now through the interval, and in the presence of a Royal Commission on Technical Education, we can with some satisfaction claim to have contributed to the visible results by our persistent advocacy. Unhesitatingly, however, we must express our opinion again that the decline of the apprenticeship system in this country is a matter to be deplored, and even now, when trades are being split up and subdivided, a system of regular apprenticeship is a thing to be urgently recommended, even if some modifications are found to be necessary in respect to time and conditions of servitude. Through the immemorial system of apprenticeship a normal or regular training-school was provided, in a manner, for the young workman. Being under a master, who was bound to teach him his trade, and found it to his interest to do so, the apprentice steadily progressed in the knowledge of his trade, particularly as he was always more or less in contact with a number of journeymen skilled hands, employed in the workshop. Technical education, in itself, is commendable, even if it only results in imparting scientific knowledge, but, to be serviceable to our future race of workmen, proper means and methods must be provided or arranged for the young workmen to apply it. Our elementary schools of the present time are imparting to pupils useful and practical knowledge, and as time advances they will probably be rendered more serviceable with a view to the future vocations of our youth, for boys' tastes and leanings are more accurately ascertained or visible before they leave school. We cannot attempt to anticipate what the recommendation of the Royal Commission may be, and whether, in their view of the present state of the apprenticeship system in England, they will be prepared to advise the formation of workshop schools, or training-classes in connexion with our large industrial handicraft and manufacturing firms and establishments. If a system or systems of industrial education that have obtained for a time, to some extent in certain cities and towns on the Continent have been found to work well in the interest of skilled labour, there can be no serious objection urged in this country to their introduction, and to giving the best of them a fair trial. Whilst most unexceptionable work is still executed in many skilled trades and industries in Great Britain, the fact is patent at the same time that we have large bodies of workmen in our midst who are not competent hands, and that it was next to impossible they could be such from the nature of the training they received, or, rather, from the absence of any regular training or instruction save what they picked up in the most hurried and haphazard way, being amenable to no proper head, rule, or system, and, unfortunately, feeling when too late the penalties of their want of training in their want of work or employment, save of an uncertain and unremunerative kind.

Verily, labour and skilled labour in all branches are undergoing rapid change, and their aspects of late years, which we have on former occasions alluded to, are degenerating. In handicraft, any more than in art, no one who is interested in the industries of his country can feel anything but

regret at the growth and spread of practices tending to their injury, and to the demoralisation of the workmen. Of a verity, no; for, unless we give a dignity to handicraft by elevating the workman and making him take an interest in his work through its skillful execution, which will alike reflect credit on himself, employer, and his country, we cannot feel pleased at the condition of our industries.

A wide line of demarcation must always subsist between skilled and efficient labour,—the trained labour of competent workshop hands,—and that of amateur workmen. No small amount of the labour at present in the market is of the amateur kind, in so far as it is not the outcome of regular workshop learning or training. An amateur workman, like an amateur artist, who is outside the ranks, may possess a respectable amount of ability or skill in a particular line, but he will be found generally a workman without system, a "slow coach," an uncertain hand that cannot be yoked in companionship or relied upon with advantage. The amateur operative, pure and simple, does not often come into contact with the regular workman in the ranks of skilled labour, although the work of the former has an indirect influence in reducing the calls upon that of the latter. Men in all ages have "picked up," so to speak, trades or callings, and some of these persevering workers have succeeded in life, and others in future may succeed in a similar way, but arts or trades have never been, and never will be, sustained, advanced, and perpetuated in this manner. The amateur has a taste or liking for his work, whatever art or trade it belongs to, but the half-learned, badly trained, and incompetent workman dislikes his trade and work, because his handicraft, in execution, shames him in the face of his fellow-workmen and employer. Amateur labour in the building branches in domestic households has been always somewhat popular, particularly with the lady occupants of our dwellings. Among the lower middle classes and those under, the head of the house comes in for praise if he can handle in a rough way a few joiners' tools, and do a bit of general repairing, plain painting, &c. To put up a bookshelf, to mend an article of furniture by the aid of glue and a screw, to do a little paling or trellis work in the garden, to re-putty the glass in the conservatory, and give that structure a yearly daub of paint, or to put up window-frames, and stick on a door-bolt or sash-fastener,—is to achieve wonders in a household, and to earn the appellation from wife and friends of being "a very handy gentleman." The great majority of our households are not blessed with having a handy man in the person of the head of the house or husband. It is marvellous, indeed, that there are such a number of men in our midst who are unable to drive a nail straight, or even to hit it steadily upon the head with a hammer, without hitting a more sensitive nail and mauling the tip that sustains it. There are many housewives in humble households a great deal more handy in using the hammer, pincers, screw-driver, and gimlet, and even the saw, than their husbands. In hanging pictures, laying down carpets, putting up curtains, and doing a little upholstery work, women in a number of households will be found in advance of their husbands.

Such bad building and repairing work now obtains among a certain class of jobbing builders, and also in the work belonging to other trades, that householders with small means venture on bits of patching and inside repairing on their own account if there be a "handy man" in the family. The moral to be derived from all we have written is obvious enough. Good training is necessary to produce good workmen, and the sustenance of a good class of skilled workmen will tend to good building and other work. As many of our workmen eventually become employers of labour, it is natural to expect that as they were skilled workmen themselves they will, as employers, endeavour to procure competent hands, and secure the reputation of turning out creditable work. With honest intentions guiding the conduct of their business, they will seldom fail to give satisfaction to all who may need their services.

**Ladies' Sanitary Association.**—The prizes and certificates adjudged to candidates by Dr. R. W. Richardson, in the second competitive examination on "Domestic Sanitation," will be presented by Mr. Samuel Morley, M.P., on this Saturday, February 18th, at four p.m., in the Hall of the Society of Arts.

## THE NATIONAL INDUSTRIAL HOME FOR CRIPPLED BOYS, KENSINGTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a number of the members of the Architectural Association paid a visit to the new buildings lately erected for the enlargement of the National Industrial Home for Crippled Boys, Wright's-lane, Kensington, where they were very kindly received and conducted over the premises by Mr. E. C. Robins, the architect, Mr. F. J. Bovis, the superintendent, and Mr. Woodley, the clerk of works. The institution, established some fifteen or sixteen years ago, has gradually grown in extent, and now has sixty inmates, which number will shortly be increased to one hundred. The object of the institution is to receive for three years (and to board, clothe, and educate) destitute, neglected, or ill-used crippled boys, not under twelve years of age nor over eighteen, and to teach them a trade. First temporarily located in Young-street, Kensington, the Home was after a time removed to Woolthorpe House, in Wright's-lane. This house is so named after Woolthorpe, in Lincolnshire, the birthplace of Sir Isaac Newton, and is known to have been his property. It is said that he resided here, but of that we believe there is no direct evidence. It is further sometimes said that in the garden behind the house grew the celebrated tree from which Newton saw the apple fall, but in most, if not all accounts of Newton's life, the apple-tree in question is stated to have grown in the garden of his home at Woolthorpe. In the garden behind the institution at Kensington is still pointed out a very fine old mulberry tree, in connexion with which the following story is, warrantably or not, told. It is said that the great philosopher was one day sitting beneath this tree, meditating and smoking a pipe. By his side sat a lady who fancied that he was deeply in love with her. Presently he took her hand, and she was greatly agitated at the thought that a momentous proposal was about to be made to her; but the philosopher, in his abstraction, only took her hand because he wanted to use one of her fingers as a tobacco-pipe stuffer! Woolthorpe House and some old buildings adjoining formed the nucleus of the Home in its new quarters, and workshops, kitchen, scullery, and servants' apartments were first erected. As funds came in and were available for building purposes, other buildings, including a schoolroom, playroom, and dormitories, were added. Woolthorpe House itself was thoroughly overhauled, and has been altered and added to from the cornice upwards. The old entrance-doorway, and an interesting old mantelpiece, have been preserved. The front of Woolthorpe House, being of red brick, the façade of the main block of the new buildings is also in brick of the same colour. Behind Woolthorpe House is the "Louise Hall," so called because H.R.H. the Princess Louise, Marchioness of Lorne, laid its memorial stone in 1877. This hall is used for lectures and entertainments, and is intended also for use as a dining-hall. The buildings, the erection of which has extended over several years, have cost in all nearly 17,000*l.*, Messrs. Lucas & Son and Messrs. Bywaters having been the builders. Roughly speaking, the premises form three sides of a long quadrangular playground, beyond which is the garden, and at the bottom of the latter is a small detached cottage, for use as an infirmary or hospital, for the isolation of any of the boys suffering from any contagious disease. This, it seems, has seldom been used. The sanitary arrangements throughout appear to be excellent. In the dormitories, Boyd's hygienic warm-air grates are used, in conjunction with outlets for vitiated air, some of them being provided with Bunsen gas-burners to assist the extraction. Fresh external air is admitted cold by means of Tobin tubes, and warm air by means of the stoves before mentioned. The water-closets used are Pearson's twin-basin trapless closets, which were stated to have given satisfaction, notwithstanding the somewhat rough usage to which they have been subjected for some four or five years. All drains are trapped and disconnected, and laid in straight lines from manhole to manhole, so that all sections of the drainage can be readily inspected. The trough-closets or latrines and urinals are automatically flushed by means of Mr. Rogers Field's siphon-tanks, as made by Messrs. Bowes, Scott, & Read. The tanks contain from 50 to 100 gallons of water, and can be set to discharge



five or six or more times per day, according to the rate at which water is admitted into the tanks. The flush thus obtained is exceedingly effective. Mr. Robins stated that this was the first time he had adopted this arrangement, and he was very pleased with it. In Germany, whence he had lately returned, great attention was being paid at the present time to sanitary arrangements of this kind, and the Germans were running us very closely in all such matters. It was true that they got many of their ideas from English inventions, but they were continually improving upon and perfecting the appliances suggested or introduced in England.

Before leaving the premises, the visitors inspected the workshops, of which there are three, viz., one in which relief-stamping for stationery is carried on, together with copper-plate printing and lithography; one in which tailoring is taught; and thirdly, a carpenter's shop. Each workshop is under the control of a master workman, who instructs the boys in their work. A great deal of good work is turned out by the boys every year, the receipts for which (although the charges are very moderate) more than cover the expenses of teaching-staff, materials, &c. A fourth workshop is about to be introduced, for the teaching of the saddlery and harness-making trade.

The Home, of which the Earl of Shaftesbury is president, is an exceedingly deserving institution, and is largely dependent on voluntary subscriptions and donations. Those of our readers who may care to visit the institution in full work will be courteously received by the Superintendent, Mr. Bovis.

#### DISCOVERY OF AN ANCIENT STONE CIST AND STONE IMPLEMENTS IN ORKNEY.

MR. SMITH, farmer, Grind, on making a road from his house to the new Tankerness-road, Orkney, lately came upon a stone cist, containing the skeleton of a child. Information was brought to Mr. J. W. Cursiter, F.S.A., who, along with Mr. T. S. Pearce, architect, visited the place a few days ago, and carefully examined it. The cist was 1 ft. 9 in. long by 12½ in. wide and 15 in. deep, constructed of rough slabs of grey slate, from 1½ in. to 2 in. thick, joined together by half-checking in their width, and covered by a heavy and rather water-worn slab, about 5 in. thick. A stratum of clay, about 8 in. thick, had been deposited above it, and peat had formed over all, to a thickness of about 4 in.

The thinness of the peat formation, after such a long period, is explainable from the fact that it was on the top of the mound, where the wind and rain would subject it more readily to denudation than on level ground. The cist lay lengthwise, about east by north and south by west, the head of the skeleton being towards the east, but the bones were very much decayed, and had crumbled to some extent on being exposed to the air. The skull was very well formed, and the remains of the jaws showed several undeveloped and some full-grown teeth. In addition to the bones of the skeleton, a small bone implement or ornament, about 2½ in. long, of the thickness of an ordinary lead-pencil, with a small notch cut around one end of it, was found. It was well made, and seemed as if it had originally been polished. No other articles were found either in or about the cist. The cist itself was situated on the site of a mound, of about 50 ft. diameter, and 6 ft. to 7 ft. high, and it seems not unlikely that more than one interment had taken place in it, though as yet only the one grave has been met with. The bulk of the mound is formed of large quarried stones, which must have been conveyed to the spot, as no rock is known to exist there. It should be mentioned that the bottom of the cist did not consist of one slab, but was formed of a smoothly-set surface of small pebbles, over which clay had been deposited by filtration to the depth of nearly 1 in. The slabs forming the sides and ends of the cist, and also portions of the skull, were slightly encrusted with stalactite deposit.

On the estate of Saverock, about two miles from Kirkwall, Mr. Fergus, the proprietor, in walking in one of his stable-fields last week, observed, half-embedded in the soil, a white stone celt in a fairly well-preserved state. This led to further examination, when, within a few feet, he picked up a perforated hammer-head of granite. A stone mortar and some rough stone

hammers found in the same field, and also the half of a fine-grained polished granite axe or hammer, have since been obtained by local antiquaries.

#### NOTES AT THE SPORTSMAN'S EXHIBITION AT ISLINGTON.

THIS exhibition, opened on the 9th inst., closes this Saturday, the 18th. Although it contains much to interest many of our readers, there are not many exhibits which come altogether within our own special domain. The first thing that will strike the visitor is that the carriage shops and their contents sent to the Agricultural Hall. This department of the exhibition certainly seems to be overdone. Most of the exhibits in it are very good, but possess little or no novelty. Hart's patent "Thauma" carriage, a reversible Stanhope phaeton and wagonette, has the front seat so arranged as to open across the centre, the two halves of the seat concurrently sliding outwards, so as to form a passage whereby a person in the back part of the vehicle can pass to the front seat without either dismounting and re-ascending, or climbing over the back of the seat. This is obviously a very convenient arrangement, especially for ladies. Messrs. Marston & Co.'s "Imperial Brougham Hansoms," shown in two forms, embody some recent improvements which are likely to be appreciated. While speaking of carriages, we must not omit to direct special attention to the hospital ambulance exhibited by the patentee, Mr. J. U. Bart, carriage-builder, Swinton-street, Gray's Inn-road. The one exhibited has been purchased by Mr. J. H. Crossman for presentation to the London Hospital; and we understand that one is in use at the Gas Light and Coke Company's Works at Beckton, where from 2,000 to 3,000 men are employed. The ambulance is mounted on four wheels, and is intended to be drawn by horse-power. It is covered with waterproofed canvas on the top and sides, portions of that at the sides being removable for the admission of fresh air when circumstances render it necessary or desirable. The litter slides in and out from the back on rollers, and by the side of it is a seat for an attendant. On an emergency, the ambulance can be made available for the conveyance of two or four persons. The vehicle, as a whole, is light, compact, well arranged, and mounted on easy springs, not likely to be found too easy, however, by suffering patients *in transitu*. An effort is now being made to establish a properly-organised hospital and accident ambulance service for London, and a paper on the subject was read on the 30th ult. before the Medical Society of London by Dr. Benjamin Howard, F.R.C.S.E. We notice the subject at this length, because, unfortunately, accidents are continually occurring to workmen engaged in the erection of buildings, and it is in many cases of vital importance that the injured should be promptly and easily conveyed to a hospital. Before leaving the subject of carriages, a word is due to the remarkably large collection of bicycles and tricycles, which occupies the whole of the spacious galleries. Some of these machines are models of excellence, both in finish and adaptability to the end in view. No one can witness this large display, made by many exhibitors, without becoming aware of the importance and extent of this comparatively new manufacture, the principal seat of which appears to be Coventry. To our older readers, who remember when, as in the case of the movement for opening gas, and that for bringing about the wearing of the moustache and beard, the *Builder* worked single-handed to make evident the advantages that would result from such a mode of locomotion, it will appear the more surprising.

Messrs. Croggon & Co. exhibit a very convenient portable shooting-box of three rooms, externally of corrugated iron, but lined internally with match-boarding, a layer of inodorous felt being placed between the iron and the wood for the sake of ensuring greater warmth. As furnished by Messrs. Bartholomew & Co., it is a very comfortable little retreat. Mr. W. H. Lascelles, of Bunnhill-row, also shows a very convenient portable building, wholly of wood. The sides are made of rough weather-boarding outside, and are lined inside with varnished match-boarding. The floor is boarded, and the roof boarded and covered with prepared roofing felt. These buildings are cheap and good of their kind, and have, we are told, been largely used as shelters for shepherds, gamekeepers,

&c. Messrs. Boulton & Paul, of Norwich, have several good and useful things in the way of movable piggeries, fowls' houses, &c., and their composite dog-kennel and run is well worthy of attention by those who own dogs, and wish to keep them controlled without subjecting them to what has been called the "torture of the chain." Messrs. Soane, Smith, & Co. are exhibitors of some well-made china dinner and other services, but we have before now deprecated the taste which, as in the sets made for the Empress of Austria, has led to the representation on each piece of some very realistically-treated scene in the hunting-field. Messrs. Thurston & Co., of Catherine-street, Strand, are exhibitors of some well-made billiard-tables and billiard-room furniture and gas-fittings; and Messrs. Burroughes & Watts, of Soho-square, have also a very good display of the same kind of furniture, including their very useful "Cottage" billiard and dining table combined, interchangeable in one minute. Mr. Hindley, of Bourton, shows some combined vertical engines and boilers, and Messrs. Ihles & Horne are exhibitors of Balmis's luminous paint. Messrs. Steven Bros. & Co., of Upper Thames-street, are the sole exhibitors of stable and cowhouse fittings, which (mentioned elsewhere in the present number), without being pretensions, are very good of their kind. Sportsmen know how to appreciate a good dinner, and therefore may be expected to take some interest in the admirable cooking-range, which, with other stoves and miscellaneous articles, go to make up the remainder of this firm's exhibits, though these, the firm explain, would not have been sent by them but for a strike on the part of the moulders which prevented the preparation of "fittings." Foster's patent fire-extinguishing appliances are exhibited by the Chemical Fire-Engine Company. Danger from another element is guarded against by the "Kredemon" patent life caps and other garments, the under sides of which have corks quilted-in so as to make them sufficiently buoyant to save the wearer from drowning.

The exhibition, taken as a whole, is a very interesting one.

#### A NEW TOWN-HALL FOR WIESBADEN.

THE chief burgomaster of the favourite Rhenish watering-place of Wiesbaden has just made known that a general competition is opened for designs for a new Rathaus or Town-hall for that city. The programme of conditions, with plan of site, are to be obtained at the burgomaster's office, Marktstrasse No. 5, Wiesbaden. The building is not to cost more than 700,000 marks, or 35,000 sterling. The site is stated to present some difficulties, and, moreover, the new Rathaus will be near a new theatre, and is to unite with that edifice and with the adjacent Evangelical Church and Schloss in forming a harmonious group of buildings. The designs are to be sent in on or before July 15th, 1882. There will be three prizes of 2500l., 1500l., and 1000l. respectively. The judges will be the chief burgomaster, Herr Lanz, and two members of the city council of Wiesbaden, together with the architects, Professors Raschdorf and Otzen, of Berlin, Herr Weyer, of Cologne, and Herr Fach, of Wiesbaden.

#### CHANNEL TUNNEL.

ON Monday, the electric light was introduced into the Channel Tunnel borings at Shakespeare's Cliff, Dover. Altogether there are six lights in half a mile of boring, one light being placed towards the end of the heading to facilitate the operations at the drilling machine. Hitherto the tunnel has been lighted by lamps and candles only. The alteration in the number of working hours has resulted in a difference of an additional 4 ft. per day being out. The average rate of boring has now been brought up to 28 ft. per day, and it is anticipated that the introduction of the electric light will make a still greater difference.

**The Proposed New Parish Church at Hammersmith.**—Samples of the stone proposed to be used in the construction of the new church are placed in the churchyard, and these the parishioners will have an opportunity of inspecting. The stone selected is red Mansfield, and is a very durable stone, although the colour is rather high. Tenders for building the new church will shortly be received.



## GLASGOW INSTITUTE OF ARCHITECTS.

The twelfth annual dinner in connexion with this Institute was held in the Grand Hotel, Sauchiehall-street. Mr. John Honeyman, F.R.I.B.A. and I.A.A., president, occupied the chair. The duties of croupier were discharged by Mr. James Sellars, jun., the vice-president. Among the gentlemen present were Messrs. Wm. Landless, treasurer of the Institute; Charles James MacLean, writer; Professor James Thomson, the College; John McLachlan, president of the Edinburgh Architectural Association; John Danskin, John Baird, George Bell, George Bell, jun., J. J. Burnett, H. K. Broadhead, John Gordon, John Hutchison, James B. Lamb, Paisley; Wm. Leiper, J. A. Morris, Ayr; John Murdoch, Ayr; John Mercer, Ayr; Alex. Petrie, Thomas Stout, writer; David Thomson, T. L. Watson, A. J. Williamson, &c. After the usual loyal and patriotic toasts.

The chairman proposed "Prosperity to the Glasgow Institute of Architects." In the course of an interesting speech, the chairman, after commenting on the Roman Villa at Brading, said,—But, gentlemen, now comes the upbraiding part of the homily. If you search the pages of the newspaper from one year's end to the other, and from one generation to another, you will find no record there of the building of a second Parthenon or Colosseum; and while the extraordinary development of physical science has produced results which, even fifty years ago, would have been pronounced beyond the range of possibility, it may perchance be some consolation to the perplexed spirit of our cultivated Roman to observe that, in architecture, at all events, we have done nothing so very extraordinary, and that even now we appreciate, and are attempting to imitate, the mosaics of his long-deserted trichium. Yes, it is a curious reflection that although since that villa was consumed and forgotten we have advanced from the distaff to the spinning-jenny, from the road to the rail, from the runner to the telegraph, from the many-voiced galleys to the *Servia*, and from the glimmering oil-lamp to the electric light, in the world of architecture we can point to no corresponding progress, and so, if we leave the journal out of view, with all its news and all that its existence and its news imply, and think only of the architecture of the present and the architecture of 1,600 years ago, the vast and startling contrast disappears, or perhaps there is a humiliating consciousness that we have hardly held our own. Now, we need not be very much concerned to find that our art, so far as it is a fine art, has made no great strides since the days of the Roman occupation; because, while without doubt every great artist contributes to the development and illustration of true principles, the effect of his teaching may be inappreciable because not appreciated. His pupils may have eyes which see not, and ears which hear not, and unsusceptible minds; and so the excellent in art must ever be rather the outcome of the labour and insight of a gifted individual than of eclectic discrimination, or even a just interpretation of the accumulated teachings of centuries. But it is otherwise in mechanical science, and it is a matter of serious concern that we have hitherto to such a small extent availed ourselves of those new appliances and materials which the inventive genius of the age has now so freely placed within our reach. It would be interesting to pursue this subject further, and to try to find out what clogs our chariot-wheels,—why it is that, whereas the science of the Romans was displayed in the construction of their buildings more conspicuously than anywhere else, with us the very reverse holds true. But I dare say you will think that I have already done enough in conformity with our "custom," and I must therefore pause. Let me only, before resuming my seat, venture to suggest a clue which, I think, might be hopefully followed in unravelling this mystery. Is it not the case that there is among us undue devotion to forms archaic and traditional conventionalities? Are we not too much wedded to forms and features of past periods of architecture, even when these have lost their original use and significance? For example, to bring this to the test, it would be an easy matter now-a-days, in such a building as Salisbury Cathedral, to carry the clearstories of the nave from end to end on iron girders without a single pier between the responds. How would you like that? Horrible! Words would fail you to utter your disgust. The idea, in short, is "too utter." Well, being a nineteenth-century

architect, I agree with you, my brethren. I hate the thought of such a thing. But it is not a monstrously absurd idea, after all. No man, I presume, will say that the nave of St. Mary's Cathedral in Edinburgh, for instance, would not be immensely more useful if there was not a stone pillar in it. Why, then, waste half of the area by building huge stone pillars in it? Why? Because the exigencies of art require it; and we find such pillars were erected in the nave of Salisbury, or some other cathedral, in the thirteenth century. Gentlemen, is not that a monstrously absurd answer? What have we to do with the thirteenth century? I shall not say, "Perish the thirteenth century," even in jest, for no one is more profoundly sensible of what we owe to it. But its ways? Surely we have changed all that; and now our resources are not less strikingly different than our needs. And, as to the exigencies of art, is that not in such a connexion just another expression for the exigencies of inveterate habit or over-mastering fancy? The exigency of the present day seems to be the artistic treatment of entirely new arrangements and new modes of construction suited to the requirements of the age, and securing the greatest amount of convenience, comfort, and security which the means at our disposal can yield, untrammelled by the precedents of the past. It is this turning back that threatens to leave us like the pillar of salt,—unmoved and unimproved,—amid the whirl of events, while prejudice and fashion "make cowards of us all." But the brave as well as the feeble-hearted draw fresh courage from the consciousness that brethren in arms are near; so, gentlemen, "shoulder to shoulder" let us be true to our useful and mutually helpful association; and now let us drink together to its continued prosperity.

The toast was cordially responded to.

Mr. Sellars, the croupier, then gave "The Edinburgh Architectural Association, and other kindred Societies."

Mr. McLachlan replied.

Mr. John Baird proposed "The Strangers Present," to which Professor Thomson replied.

Other toasts followed.

## NEW WATER WORKS.

In the course of the address read at the opening meeting of the Society of Engineers Mr. Jabez Church, the president, said:—

There can, unfortunately, be no doubt that numberless people, more especially young children, die or have their health and happiness more or less injured by drinking polluted water. If in all towns, more especially large ones, good sanitary conditions were complied with, in having proper sewers and house drainage, with a wholesome water supply, much sickness and untimely death might be avoided. There is another aspect to this question which should not be overlooked. In most towns a waterworks, if designed by a competent engineer, should be a remunerative undertaking, and as no security can be better than water, inasmuch as nothing can supersede it, I venture to think the inhabitants of towns would do wisely to invest their savings at home in such sound property, thereby not only obtaining a fair return for the money, but at the same time securing the many blessings that a constant supply of wholesome water insures.

During the past year several important works in connexion with water supply have been commenced. On the 4th of June last, at Shustoke, the first sod was turned as the commencement of the construction of two large storage reservoirs in connexion with the supply of water to Birmingham. The amount of the contract for this work is 78,900*l.*, but with new pumping engines, buildings, &c., the total cost will be 125,000*l.* The engineer to the corporation, Mr. J. W. Gray, is the engineer for the work, and Messrs. Aird & Sons are the contractors.

In July last the Vyrnwy scheme of water supply for Liverpool was practically adopted by the Earl of Powis laying the first stone of the new waterworks at Vyrnwy. These important works, when completed, will be the largest of the kind in Europe, and will be able to supply a population of 2,300,000 people.

For many years the corporation of Liverpool have been considering what was best to be done for the water supply of their vast district, and many schemes have been laid before them, and the advice of some of our most eminent engineers has been taken upon the matter.

From the numerous schemes which engaged the attention of the corporation, two projects were ultimately selected, namely, those known as the Haweswater and the Vyrnwy schemes, when, after they had been subjected to the most careful consideration, and the merits of each had been weighed, the Vyrnwy scheme was selected by the corporation. The site of the future reservoir is a valley 750 ft. above the level of the sea. The lower end of this valley is some 300 yards wide, and here will be erected the retaining embankment. The depth of the excavation for this embankment will be 40 ft. below the present level of the ground, and the embankment will be carried to a further height of 84 ft., making the total height of this huge masonry wall 124 ft. from top to bottom. The width at the base is to be 100 ft., receding to 17 ft. at the top of the structure. From this lake the water will flow into Liverpool through an aqueduct sixty-seven miles in length, which will be formed partly by cast-iron pipes, and partly by tunnelling. To lessen the pressure of such a great head of water in the mains, there will be relieving reservoirs in the line of route. The cost of this work is estimated at 1,250,000*l.* The engineers are Mr. Thomas Hawkey and Mr. G. F. Deacon, of Liverpool.

In October last, the construction of new waterworks for Wakefield was commenced. These works will consist of a compensation reservoir to contain 240 million gallons; a storage reservoir to contain 200 million gallons; a storage reservoir to contain 300 million gallons; also a small service reservoir, about two miles from the town, to contain a few days' supply, and which will regulate the pressure in the town mains; a catch-water conduit; a line of iron pipes, 1 ft. 9 in. and 1 ft. 6 in. in diameter, from the reservoirs to the town; together with filter beds and other works. The engineer is Mr. E. F. Filler, of Leeds. Many other works were commenced or completed during the last year, which time will not allow me to notice.

## DANGEROUS STRUCTURES IN THE METROPOLIS.

THE Metropolitan Board of Works, at its meeting on the 10th inst., had before it a report from the Works and General Purposes Committee stating that they had considered the question of filling the vacancies in the Dangerous Structures branch of the Architect's Department, caused by the retirement of Mr. E. B. Hudson and Mr. W. Withers, referred to the Committee on the 27th ult. Mr. Hudson and Mr. Withers were employed temporarily, and had been so for some years, the former at 2*l.* 10*s.* a week, and the latter at 1*l.* 1*s.* a week. The Architect had suggested that, as there was no probability of any diminution of the work in this branch of his department, two young men should be appointed in the fourth class of officers; and the Committee, thinking this would be the best course, now recommended that the two vacancies be filled by the appointment of two clerks in the fourth class, at a commencing salary of 80*l.* a year; and that an advertisement be issued inviting applications for the two clerkships, and that the applications when received do stand referred to the Committee, with a view to the candidates who may appear most suitable being submitted to a competitive examination, and to the successful candidates being recommended to the Board for appointment. The report was adopted.

## THROWING SNOW INTO SEWERS.

At the meeting of the Metropolitan Board of Works on the 10th inst., the Works and General Purposes Committee presented a report stating that they had considered a report made by the Engineer, and referred to them on the 6th ult., submitting correspondence with the Vestry of St. Marylebone as to throwing snow direct into sewers in which there was an ample flow of water. The committee had conferred with the Solicitor, who advised that a communication be addressed to the Vestry to the following effect, viz., that the Board were advised that they had power to restrain and regulate the sending of snow, whether melted or unmelted, into the sewers; that such authority was vested in them by virtue of their general powers under the Metropolis Management Acts, and in particular by sections 138 and 205 of the Metropolis Local Management Act, 1855, and section 83 of the Metropolis Management Amendment Act, 1862;



and that the Board, acting upon the advice of their Engineer, could not sanction the sending into the sewers snow, either melted or unmelted, except as to melted snow in such a limited manner, and subject to such conditions, as the Engineer might approve. The committee recommended that a letter be addressed to the Vestry of St. Marylebone accordingly. The report was approved.

#### STREET IMPROVEMENT AT MABLEDON-GATE, EUSTON-ROAD.

At the meeting of the Metropolitan Board of Works, on the 10th inst., the Works and General Purposes Committee reported that they had considered the memorial from the Vestry of St. Pancras, referred by the Board on the 7th of October last, on the subject of an improvement to be carried out by the Vestry in Mabledon-place, Euston-road. The memorialists drew attention to the removal of the gate at the entrance to Mabledon-place, and to the importance of the thoroughfare thus opened up between the northern and southern parts of London, and upon these grounds they asked for a liberal contribution towards the improvement which they contemplated, consisting of the removal of three houses at the Euston-road end of Mabledon-place, and the rounding-off of the east corner. The committee had viewed the locality, and had received a report from the Architect, in which he stated that the cost of the acquisition of the property would be 4,850l., and that there would be a recoupment of 400l., leaving a net amount of 4,450l. The Committee further learned that the Vestry proposed to widen the roadway on the eastern side of Barton-crescent to the extent of 10 ft., at a cost of 700l. The Committee were of opinion that the proposed improvement was a very desirable one, and they recommended that the Board do contribute one-half of the net cost of the same, each contribution not to exceed the sum of 2,575l., and that it be paid to the Vestry on a certificate by the Architect of the Board on the completion of the work, and by the Accountant of the net cost of the same. These recommendations were adopted, and thus there is a fair prospect of the execution of a very desirable improvement, and one the desirability of which has been spoken of in our columns.

#### COMPRESSED AIR AS A MOTOR FOR TRAMWAY CARS.

The Works and General Purposes Committee of the Metropolitan Board of Works presented a report to the Board, at its meeting on the 10th inst., to the effect that, in pursuance of a reference to them by the Board on the 6th ult., they had considered a letter received from Messrs. Ashurst, Morris, & Co., applying for the Board's consent to the use of the "Mikaraki Compressed Air Auto-mobile Cars" on the Caledonian-road line of the London Street Tramways Company, and enclosing report of Sir F. Bramwell on the subject. The committee having given careful consideration to this matter, and conferred with the Engineer thereon, saw no objection to a trial of the cars on the road suggested for a period of three months, and they recommended in accordance with this view. The recommendation was adopted.

#### GERMAN CEMENT IN AUSTRALIA.

The German nation is developing its export trade in every possible way. Amongst other means towards that end there is an association which has for its object the diffusion of reliable information as to the wants of foreign countries and as to the progress which German goods are making in various foreign markets. Australia is receiving a full share of attention from this organisation, and a branch society seems to have been started in that part of the world where the Melbourne and Sydney Exhibitions have done much to familiarise Australians with the varied products of German industry.

From a communication made to the society by a German architect at Melbourne, it would seem that the value of Portland cement as a substitute for brick in building is receiving full recognition in the Australian colonies, where the scarcity of labour makes the application of a system requiring less-trained workmen than ordinary bricklaying or masonry a matter of practical utility. The cement spoken of is that of the Yorwöhle Portland Cement Factory, near

Holyminden, in Brunswick. The sanitary advantages of the system are dwelt upon with special reference to the fact that in damp seasons bricks absorb a large quantity of moisture, which is given off when they are in use, and cause the dampness on walls of which complaints are often made.

#### SITES CLEARED UNDER THE ARTISANS' DWELLINGS ACT.

IMPROVED INDUSTRIAL DWELLINGS COMPANY (LIMITED).

The report of this Company (of which Sir Sydney Waterlow is chairman), presented to the shareholders at their meeting on the 10th inst., states that during the half-year ending the 31st of December the sum of 689l. 7s. 5d. was paid on account of balances due on estates completed, and 13,506l. 7s. 11d. in respect of works in progress. The total expenditure on capital account is now 744,007l. 19s. The expenditure on works in progress has averaged 58,500l., of which 42,700l. was only partly productive, and 15,800l. was wholly unproductive. The total income for the half-year amounted to 36,168l. 16s. 7d. The total expenditure was 21,470l. 11s. 2d., leaving a divisible profit of 14,698l. 5s. 6d., which, added to the balance, 249l. 17s. 9d., brought forward from last half-year, gives a total of 14,948l. 3s. 2d. available for dividend. The directors recommend the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax, which will absorb 10,625l., and that 4,000l. be added to the reserve fund for the equalisation of dividends, which will then amount to 47,000l., and that 323l. 3s. 2d. remaining be carried forward to the next half-year's account.

The estates are maintained in thorough repair, and the sanitary condition of the dwellings is in all respects satisfactory. Walston Buildings, in Old Kent-road, have been completed, and, with the exception of a few of the larger tenements, are fully occupied. Darwin Buildings, Walworth, brought into revenue in the previous half-year, are also fully let. Dover Buildings, Old Kent-road, are almost completed, and will be opened at the end of February. The directors have commenced the erection of 125 additional dwellings at the Bethnal-green estate, and propose to add eighteen more by raising some of the older buildings. These works will complete the estate, and will make the total number of families resident there 1,021, and the number of individuals about 4,600. The estate is nine acres in extent.

The directors have purchased at auction, from the Metropolitan Board of Works, a freehold plot of ground in Great Eastern-street, Finsbury,—a busy and densely-populated centre, where workmen's dwellings are greatly needed. This is one of the sites set apart under "The Metropolitan Streets Improvement Act, 1872," and the same was sold by the company, calculating the rents previously offered at twenty-five years' purchase, is practically that which the directors offered the Metropolitan Board of Works in May, 1877, and on one or two subsequent occasions. Another site, situate in Tyssen-street, Bethnal-green, was also sold at auction, at a price which, worked out on the same basis, was only fractionally in excess of that tendered by the company in April, 1873; so that not only have the ratepayers lost in rental an amount equal to one-sixth of the value of the sites; but the poor, for whose accommodation the land was appropriated, have been for years debarred the opportunity of enjoying the benefits which were intended by Parliament. Of the ten sites set apart under the Act of 1872, seven are now disposed of, and with respect to one of these it may be noted that the Metropolitan Board of Works has let it on terms less favourable than those upon which the directors tendered in February, 1879, calculating the rent then offered on the basis, viz., twenty-five years' purchase, upon which the ground-rents of some of the other sites had been sold by the Board. The Select Committee of the House of Commons, appointed to inquire into the causes that have prevented the reconstruction of dwellings for the labouring classes, under the Artisans' and Labourers' Dwellings Acts of 1875 and 1876, and the Metropolitan Streets Improvement Act, 1872 and 1877, obtained most important evidence in connexion with these subjects, and as one result of the recommendations made in the interim report of the Committee, the sites recently sold at auction were offered for public competition without the onerous, stringent, and unjust covenants, which, on former occasions, had been insisted on, and to which the directors have from time to time objected.

West London School of Art.—Mr. G. A. Sala is to preside at the distribution of prizes to the students at the West London School of Art on Saturday, the 25th inst.

#### COFFEE TAVERN, KING'S LYNN.

The St. Ann's-street Coffee Tavern was opened by the Mayor, Mr. J. O. Smetham, on Friday in last week, supported by a large assemblage of the principal inhabitants of the town.

The new building has a frontage of 26 ft., with a depth of 90 ft.

The front is of red brick, in the "Queen Anne" style, and is relieved by cornices, string-courses, and other decorations of moulded bricks, procured from Messrs. Brown's, Broad-street, buildings, London; the facing bricks from Mr. Walker's yard at Masingham.

The ground floor contains the bar, 29 ft. by 20 ft., with manager's room, kitchen, &c., in the rear. On the first-floor are the reading and billiard rooms, with lavatories, retiring-rooms, &c.

The second or top floor contains a suite of bedrooms for the use of the masters of ships and others, thereby combining a Coffee Tavern and Sailors' Home.

The cost of the building, with fittings, will be over 2,000l. Messrs. Adams & Son, of King's Lynn, were the architects; and Mr. W. H. Brown was the builder.

#### THE NEW WING AT THE SUNDERLAND INFIRMARY.

The large and handsome new wing of the Sunderland Infirmary, which will enable the managing committee of the institution to provide accommodation for forty-six additional patients, is now approaching completion, and will, it is anticipated, be ready for occupation during the coming spring. It will be named the Backhouse Memorial Wing, in compliment to the late Mr. Edwin Backhouse, a philanthropist whose benefactions were not confined to the Infirmary.

The new building, the site of which is at the corner of Durham-road and Elwin-terrace, is in close proximity to the main block, and, indeed, has communication with it. The style of architecture adopted is a free adaptation of the Geometrical Gothic, the material used being best Sherburn red bricks, with stone dressings from Camphill Quarry. The dimensions are: length, opposite Elwin-terrace, 184 ft., and width in Durham-road, 60 ft. At each angle of the building there are two small towers, and between a balcony, to allow of the convalescents enjoying the fresh air. The main centre block is three stories in height, and the ward blocks on either side three stories. Over the centre block is a large louvre or flèche for ventilation, and projecting in front of the same block is the operating-room.

Entering the building from the existing doorway of the infirmary, and passing along the corridor, the central hall of the new wing is reached, which is lofty and well lighted. Here will be found a central granite column, with arches springing from it, and forming an arched, which may be regarded as rather a novel feature.

On the right side of this large and spacious hall are the main stairs, and on the left a corridor for reaching the special wards. Passing along the corridor the museum is arrived at, and then three wards for the treatment of special cases, containing two beds each. The dimensions of these wards are 19 ft. by 16 ft., and contain about 2,000 cubic feet per patient in each ward. At the far end of the corridor is the annex for the bath on the west side, and the annex for the lavatory and closets on the east side, these annexes being out from the main building by a cross ventilated passage. Returning to the central hall, a corridor in front of the visitor leads to the operating-room, which is 27 ft. by 19 ft., and is lighted up by a skylight of novel construction, which diffuses the light equally over the apartment. At the east end of the room there is also a three-lighted window. The lavatories and sink are placed in arched ovals built in the wall of the room, and in connexion therewith is a waiting-room for the reception of accidents. Returning to the hall again, and proceeding south, the first children's ward is reached, this being fitted with twelve beds, and allowing of 1,650 cubic feet per patient. At the south end of this ward is the bath-room, lavatory, &c., with separate annexes, and constructed on the same principle as those already described. The dimensions of the children's ward are 25 ft. by 54 ft., and 14 ft.



in height, as is the case in this latter respect with all the rooms on the ground floor. There is, also, in connexion with the children's ward a kitchen 12 ft. by 13 ft. Want of space prevents further description; but we may add that the walls and ceiling of the operating-room are finished with polished Parian cement, which makes a perfectly non-absorbent surface, while, as an additional safeguard, these walls and ceiling will be coated with patent silicate paints, rendering the surface of a glassy character. All the angles of the walls and ceilings, moreover, will be slightly rounded to prevent the lodgment of dust. The architect is Mr. John Eltringham, of John-street, Sunderland; and the various contractors are,—masonry and stonework, Messrs. Hirst & Sons; joinery, Messrs. D. & J. Ranken; plumbing work, Mr. J. B. Wilkinson; slating, Mr. Preston; and painting, Mr. Kirkup, all of Sunderland. The parquetry will be supplied by Mr. Ebner, of London.

#### THE BOARD OF WORKS AND NEW STREETS.

At Worship-street, Charles Roberts, builder, was summoned by the Metropolitan Board of Works for not making a street called Tyson-street, Hackney, 20 ft. wide (footway only) contrary to the 25 and 26 Vict. c. 102, s. 98, and By-laws.

The summons was first heard on the 11th ult., when Mr. Bushby stated his intention to convict the defendant, but adjourned the summons for a month to enable the defendant to comply with the Board's requirements. At the adjourned hearing, Mr. Burton, solicitor for the Board, stated that defendant had now made the street the requisite width, and he was fined 10s. and costs.

#### BUILDING PATENTS.\*

##### APPLICATIONS FOR LETTERS PATENT.

536. D. Thompson, W. H. Thompson, and W. J. Bover, Leeds. Ovens heated by gas. Feb. 3, 1882.
544. G. Olway, Brixton. Cutting bricks, tiles, &c. from plastic clay. Feb. 4, 1882.
548. R. George, London. Stoves and fire-places for heating, ventilating, &c. Feb. 4, 1882.
556. E. Verity, J. M. Verity, and B. Banks, Leeds. Securing and ventilating by sash and other windows. Feb. 4, 1882.
566. T. Redmayne, Sheffield. Fireplaces. Feb. 6, 1882.
568. C. D. Abel, London. Chimney-cowls. (Com. by H. Hahn, Berlin.) Feb. 6, 1882.
615. J. H. Mills, Southampton. Construction of window-sash and door frames. Feb. 8, 1882.
623. H. Leggett, Bradford, and E. Marsh, Leeds. Construction of cooking and other stoves, &c. Feb. 9, 1882.
625. J. Winfield, Derby. Open fire-grates. Feb. 9, 1882.
634. J. Brindle, Southport. Facing walls or buildings with slabs of stone, &c. Feb. 9, 1882.

##### NOTICES TO PROCEED

have been given by the following applicants on the dates named.

February 7, 1882.

4,253. J. McMillan, Glasgow. Apparatus for feeding fuel to fireplaces. Oct. 1, 1881.

February 10, 1882.

4,324. A. Wightman, Sheffield. Fluid meters. Oct. 5, 1881.

5,397. W. Whitwell, Stockton-on-Tees. Apparatus for heating air, &c. Dec. 9, 1881.

##### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending February 11, 1882.

2,793. J. L. Seymour, New-cross. Venetian blinds.

Instead of nailing the ladder tapes to the top bar and the bottom rail, a plate is fitted to these through slits, in the sides of which are passed and secured the ladder tapes. June 25, 1881. Price 6d.

2,818. W. R. Lake, London. Apparatus for preventing escape of sparks and soot from chimneys.

A cylindrical hood is placed on the top of the chimney, covered above with a slating plate, in the centre of which is the opening for the escape of the gases. On a spindle in the centre of the cylinder are a number of cones, the diameters of which increase upwards. Round these cones are a series of spiral plates, which catch the sparks and the soot, and force them out into the sides of the cylinder, where, being out of the draught, they fall to the bottom, and can be removed. (Com. by A. Petgold, Berlin.) June 27, 1881. Price 6d.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

2,881. A. H. Elliott, New York, U.S.A. Apparatus for crushing and drying or heating stone.

The material to be crushed is first passed through a crushing-machine with jaws, and then through a pair of revolving rolls. A screen separates any lumps larger than are required, and carries them again to the rolls. The dry products of a sash, or on the two opposite sides of which are a series of slats inclined inwardly, through which the hot air that passes up from a fire at the lower part has free access to the material contained within. (Pro. Pro.) July 2, 1881. Price 2d.

2,883. H. P. Dunnill, Ironbridge. Decorating tiles, &c.

The design is drawn on a lithographic stone. An impression from this is transferred to the tile by rubbing the paper so that the colouring matter is deposited on the tile, which is afterwards burnt. (Pro. Pro.) July 2, 1881. Price 2d.

2,914. C. D. Abel, London. Compound re-sembling wood.

This is made of wood fibre or cellulose, sawdust, dry powder of dextrine, flour, and chalk of gypsum. This is boiled in water, and then rolled into sheets. It is then formed into any required shape for decorative building purposes by being pressed in hot moulds. (Com. by B. Harris, Bohlen, Germany.) July 4, 1881. Price 4d.

2,921. H. J. Haddan, Westminster. Roads and pavements.

The surface of the ground is prepared by concrete and a mixture of hot tar and sand is then poured on, over which is placed a layer of clean pebbles. (Com. by J. Salviat, Moreaux, France.) (Pro. Pro.) July 4, 1881. Price 2d.

2,945. F. D. Harding, Hampstead. Applying pictures or decorations to door panels, &c.

A thin sheet of metal is used, on which the picture, painted on silk or satin, is stretched. The metal is then secured to the door panel. (Pro. Pro.) July 6, 1881. Price 2d.

2,975. E. Johnson, St. Helen's. Manufacture of bricks, tiles, &c.

Instead of using oxide of iron in the making of blue bricks, copper slag is employed, which is mixed with the clay, and before burning the brick. It may be rolled in dry powdered slag to deepen the colour. July 7, 1881. Price 2d.

2,978. H. J. Haddan, Westminster. Chimney-caps.

The cap is made of four angle-pieces joined together with a flange on top to prevent water entering the chimney. Com. by A. Pichereau, Cailly, France.) (Pro. Pro.) July 7, 1881. Price 2d.

#### NEW WESLEYAN SCHOOLS, BLOCKLEY, MANCHESTER.

THESE schools adjoin the present chapel, and have communication therewith. The buildings comprise on the ground-floor a mixed school, 55 ft. by 39 ft.; connected with the same are five spacious class-rooms, also an infants' school, 32 ft. by 21 ft. Each school has separate hat and cloak rooms and playgrounds. The school-rooms have dados of Staffordshire glazed bricks of selected tints, and the class-rooms pitch-pine boarding; all have open-framed roofs, and are lofty and well lighted. Externally the building is faced with white headers, relieved with bands of coloured bricks and masonry. The roofs are slated with enriched cresting. The schools are warmed by means of hot-water apparatus, and the class-rooms by open fireplaces.

The building has been erected by Mr. R. Whitell, of Barnes Green, at an outlay of about 1,900*l.*, under the superintendence of the architect, Mr. John Lowe, Manchester.

#### IRON AS A CONSTRUCTIONAL ELEMENT.

ENGINEERS, as a body, have always been fully alive to the immense value of iron as a constructional element, and whenever possible they have utilised this value in preference to the inferior one of timber.

Architects, on the contrary, have been more conservative, and have clung with more fidelity than reason to those simple elements of construction which were utilised by the ancients. Had the architects of the Classic or Gothic era been fortunate enough to have had at their command such a valuable constructional element as iron is (as now manufactured), there is no doubt that they would largely have made use of it; but in those ages the science of metallurgy was hardly known, and iron was only produced at a great cost.

The readiness of engineers to utilise the triumphs of science and ingenuity partly explains the reason of the widening of the area of their professional scope, and its encroachment on what was once considered the professional territory of the architect.

If architects, instead of adopting systems of construction quite appropriate to the ages of poverty in the choice of constructional materials, would follow the example of the engineers, and utilise, adopt, and invent new applications more in accordance with the advanced stage of applied science, there would be a brighter future for architects in this more and more progressive age.

With all due deference to Professor Kerr, the writer believes that iron will be far more largely used in the constructional work of the future. The only objection against the use of iron for construction is its liability to oxidation; but now we know that science and invention have produced a process for the protection of ironwork from corrosive influences (the Bower-Barff process). It is well known to chemists that iron once properly coated with magnetic or black oxide is preserved from further oxidation. The writer has in his possession ornamental plaques, which have been subjected to various influences capable of producing oxidation for upwards of four years, and still they show no evidence of rust. Once this magnetic oxide is coated with paint, the durability of the latter will be very great, owing to the absence of oxidation under the paint,—the latter will not be thrown off,—and also owing to the high heat conductivity of iron. The paint will not blister when subjected to normal solar heat. Painted timber when subjected to solar heat rays, owing to the low heat conductivity of timber, does not permit the heat to pass through it, but radiates the heat, consequently producing blisters in the coat of paint.

The intrinsic colour of the magnetic oxide is French grey, but when oiled it becomes a dead black, so that architects desiring the valuable element of durability, by specifying that the iron be coated with magnetic oxide, can obtain the desired desideratum.

It behoves architects on patriotic grounds to utilise the natural resources of their country in preference to those foreign. Nearly all the timber used in this country for constructive work is foreign; and the money value of these timber imports is enormous, and at least a great portion of this value could be retained in this country if architects would follow the example of engineers, and adopt iron in preference to timber for flooring, &c. Iron, when properly embedded in terra-cotta or fireclay, possesses the valuable quality of fire resistance; and certainly the same of floor construction, both as regards strength, true economy, durability, and resistance to fire, is the combination of rolled joists coated with magnetic oxide and concrete constituted of real Portland cement and calcined aggregate.

B. H. TEWAITE, F.C.S.

#### CLEOPATRA'S NEEDLE.

As the modern additions to the ancient obelisk recently erected on the Thames Embankment are on the eve of completion, the present moment is opportune for making a protest, if you permit, against the ridiculous attitude of the sphinxes in reference to the shaft,—i.e., looking inwards at each other instead of outwards.\* The absurdity is so obvious that I will not occupy your valuable space with arguments derived from classical antiquities. It is enough to say that in ancient Egypt these sphinxes were placed as guardians of some structure or other which was specially venerated. Who, in these modern days, I may ask, would think of turning his watchdog's kennel looking towards the house and treasure he placed in the animal's care? The reason assigned for the attitude is, that lines from the apex of the obelisk to the tails of the sphinxes form, with the base line, an equilateral triangle. But surely this is a very insufficient reason in face of the deformity alluded to.

In the announcement of the approaching completion of the work, it is stated that "In May, 1879, the obelisk was washed with two coatings of Browning's invisible solution, which appeared to have preserved its surface."

Experience, I think, shows that this was a perfectly unnecessary precaution. The Duke of York's column on Carlton-terrace, London Bridge, the Victoria Embankment, the monument to the king's gardener in St. John's-churchyard, Kensington, and many other granite structures from thirty to 100 years old, show no signs of decay.

\* A protest to this effect has already appeared in our pages. The error should be rectified.



It is evident, therefore, that however rapidly freestone is destroyed by the acid vapours of the London air, granite is safe. It is true that the obelisk shows some signs of decay, but this is entirely owing to its having been partially buried for generations in the damp saline earth of the shore at Alexandria. Long before the erection of this same obelisk by Ostrisen, at On, the City of the Sun (the Greek Heliopolis) more than 3,000 years ago, the Egyptians had made this important discovery, and, consequently, they built their everlasting temples and other monuments of granite upon limestone substructures, upon which the damp alkaline soil has had no destructive effect whatever.

H. T.

#### PAINTING AND SCULPTURE REGARDED AS ILLUSTRATORS.

SIR,—Judging from the misty discourses upon art with which we are from time to time fogged, *brain-teasing* would seem to be considered absolutely essential to art instruction. Art questions, though among the most difficult questions for solution, are much more susceptible of simple exposition and illustration than the *dilettanti* are apt to suppose. Amateur art expositors would appear to beat about for something extremely recondite in the way of theory before they venture to declaim and to make men stare; and as if they imagined that an artist, before setting to work on either a picture or a statue, sits wrapped in meditation, like a Kant, bent on evolving art out of his own inner consciousness; whereas, in nine cases out of ten, instead of thinking out some puzzle-brain question touching the relation of art to religion, before he sets his palette or piles up his clay, he has very early in his career to determine under what banner he will enlist as an illustrator; for Painting and Sculpture are the illustrators either of religion, philosophy, or of literature, or content themselves with the more servile occupation of copying the common incidents of life.

Art, without in the slightest degree attempting to become didactic, becomes ethical, by associating herself with religion, philosophy, and poetry. She does not frame her own mood; she enlists, as we have said, under a banner. It is seldom, indeed, that she ever attempts to invent her own subjects, and when she does it, is, as a rule, with very indifferent success. She generally takes up those subjects for illustration with which the world is tolerably familiar, which have vividly impressed the public mind. It is in faithfully and rightly serving under one or other of the banners we have enumerated that Art takes her highest position in the empire of intellect. It is not by an eternal pictorial iteration and reiteration of the Ten Commandments and Watts's Hymns, as some persons would seem to suppose, that art becomes ethical. All that it is good for art to do, *rightly done*, is ethical in its tendency, and contributes, in some lesser or greater degree, to that general atmosphere of rectitude which is conducive to the intellectual health of the community. Persons stalk about discoursing upon art as if they were members of a Salvation Army and chanting psalms whose language is of all proportion to the occasion, and which are outside the limits of common sense.

Other things being equal, it is in proportion to the intellect demanded for the conception and execution of a work of art that the work takes rank. Mind takes the first rank in art, as it does in the universe. All other qualities, drawing, colour, execution, &c., are as nothing when not utilised for the illustration of either great thoughts or of the beautiful. It is for this reason that the intellectual artist invariably enrols himself under the banner of religion; for the Scriptures contain the history of the aspirations of men's souls heavenwards, and of their struggles and sufferings for truth's sake,—they discourse upon the greatest themes which can stir humanity,—they furnish the most glorious subject-matter for art illustration that can possibly be conceived. Some artists who enlist under the banner of religion may lean to the austere manner, some to the redundant and uncharged, and a few to that better way which is determined by right reason and right feeling. This choice of mode is an ethical choice. The choice of the better way from the worse is in art, as in everything else, to all intents and purposes a moral choice. The souls of men were never elevated one tittle of a degree by all the acres of canvas of Rubens's rollicking art,

wherein you may find all the machinery, technical skill, and material resources of art lavished in vain,—to no intellectual and profitable purpose. Those qualities which his works really do possess are, in the main, as vicious in one way as those exhibited in the ascetic art of an earlier period were in another. What is it that places the art of Michelangelo pre-eminent over that of Rubens? There is the same daring and fearless energy in both. Simply the fact that the art of the one is instinct with mental power, whilst that of the other revels, as it were, in mere brute force.

It is to the mental and ethical side that the art of the future will tend; all the resources that a great artist has at his command will be bent to this end. If art be not ethical in its best phases, how is it possible that it can in any degree minister to progress? Art becomes ethical without the slightest taint of pharisaical affectation, as conduct becomes moral by being perfectly proportioned to right ends. It is this unostentatious and unaffected correspondence in the progression of all things towards the best proportions, that they work together for the good. Whatever amount of misdirected thought, labour, knowledge, and skill, be lavished on works of art having other purposes than this, these will, as intellect marches triumphantly onward, be swept away as chaff before the wind.

W. C. T.

#### BELGIAN IRON.

SIR,—A short time since a statement was circulated in some of the professional journals, that Belgian iron imported into this country and largely used in buildings was exceedingly bad, especially as regards its tensile strength, and it was stated at the Iron and Steel Institute last year that some joists had been found which only equalled a tensile strength of six tons per square inch across the grain.

At the first convenience I had three joists taken indiscriminately from a considerable London stock, and sent to Mr. Kirkaldy for him to experiment upon just as he pleased, and I now send you copies of the certificates I have received.

Comment on my part is hardly needful, beyond that I may specially point to "facts, not opinions," as showing the ultimate mean tensile strength to be 21.7 tons per square inch, and the centre breaking-weight to agree very closely with the published tables of strength.

ARCHIBALD D. DAWNEY,  
Assoc. M. Inst. C.E.

#### ON SANITARY SUPERVISION.

WHEN, after the somewhat recent deaths and narrow escapes of royal personages, we learn that at Bagshot Park it was found on investigation "that a large soil-pipe from a disused closet had been simply cut through by a careless workman, and its open end, leading directly into the main drain, was left immediately under the flooring close to the central hall, and thus a continuous stream of sewer gas was poured into the house,"—it would appear that the time-honoured dictum of Horace,—

"*Pallida more æquo pulsat pede pauperum tabernas, Regumque turres.*"—

is somewhat invalidated, and that death's impartial knock is more to be feared or welcomed, as the case may be, in those mansions (*regumque turres*) where simplicity and common sense in sanitary appliances have been neglected;—while in cottagers' homes (*pauperum tabernas*) immunity is somewhat secured by uncomplacency. In the beautiful lines of Malherbe it is truly remarked,—

"*Le pauvre, en sa cabane, où le chaume le couvre,  
Est enjê à ses lois,  
Et le garde, que vaille aux barrières du Louvre,  
N'en défend pas son rois.*"—

the surest guardian from preventable disease is, however, the constant intelligent supervision of the skilled sanitarian; but "quis custodiet ipsos custodes?"

The following instance came under my notice, showing that all the arrangements, however much out of the way, will require constant intelligent supervision. In a house,—Al Sanitary Lloyd's,—repairs being required for the roof, the British workman, objecting to the smell from the soil-pipe ventilator, stopped it up with a rag; when the job was finished the removal of the impediment was forgotten. Not long after typhoid fever broke out in the family: this led to universal and complete investigation, and the

discovery of the cause of the mischief. Perhaps the narrow escape of another member of the royal family will rouse us to face the ever impending danger, and cause us to improve sanitary arrangements, which, among high or low, are an absolute disgrace to our so-called civilisation. In sanitary matters there is a vast deal of profession with a corresponding amount of insincerity; and,—as in the burning question of the suppression of drunkenness,—real sanitary progress will only be the result of the gradual education of all classes.

P. HINCKES BIRD, F.R.C.S.

#### INVASION OF ANTS.

SIR,—Perhaps it may interest some of your readers to know how the "white ant" of India is doctored, for the same treatment might be as effectual upon his black brother. The following are extracts from my note-book:—

To destroy white ants.—50 lb. vegetable wax. When melted pour into it 2 oz. of nitric acid. Apply to ant holes and chinks.

Another method:—

Arsenic.....	2lb.	4oz.
Aloes.....	2 "	4 "
Chunam soap .....	2 "	13 "
Dhobeas (washerman's) mud 2 "	8 "	

Pound the arsenic and aloes; scrape the soap; mix all these with the dhobeas mud; boil in a chattie (earthen pot) half full of water until it bubbles. Let it cool. When cold, fill the chattles up with cold water. Boil again for an hour. Apply the mixture as a wash.

Another method:—

Petroleum oil .....	10 gals.	or 3 gals.
Arsenic of commerce 4 lb.	or 1 lb.	
Sugar of lead .....	4 "	or 1 "

Mix well; then syringe into holes and crevices. This mixture I commonly used to jail, barracks, and church walls, where the oil did not make an unsightly mark.

On flat roofs we strewed coarse matting well sprinkled with sugar, of which the ants are fond. When the matting got well full of ants, it was taken hurriedly away and burned. Whichever method was adopted, constant attention was necessary. If the "queen" ant could be found, her destruction would ensure the flight of all the tribe.

Sometimes we found that a large voracious black ant attacked, conquered, and drove away the white ants.

Small black ants were very troublesome in the larder, by getting to the food. The only way to prevent their depredations was to place the food upon a table whose legs stood in pots of water, for the ants could not get across the water.

When living in the Cape of Good Hope, my bath-room was invaded one night by an army of red ants. We discovered a large nest under the floor, which we deluged with boiling water, and then carted the remains away some distance from the house. There was no more trouble with them. I hope some of these hints may be serviceable.

COLONIAL ENGINEER.

#### WOOD PAVEMENT.

SIR,—In consequence of numerous inquiries regarding the system of wood pavement at Norwich, I venture to forward you a copy of my report as to the cost thereof.\* I may state that the wood is laid simply on the old formation after it has been cleared to a depth of 5 in., upon a little sand. It is then well grouted and rammed, covered with a layer of fine shingle, which is gradually worn off. No concrete is used, nor asphalt or bedding boards. We have some which has been down for three years, and stands as well as any other wood pavement I know of.

P. P. MARSHALL, City Engineer.

**Stable Fittings.**—Messrs. Steven Bros., of Upper Thames-street and Glasgow, have just issued, in a handy form, the "Stable Fitting" section of their full Trade Catalogue, the illustrations being reduced from the originals. It seems to be very complete, and is likely to be useful. Visitors to the Sportsman's Exhibition, now open at the Agricultural Hall, will find this firm's exhibit of these and other goods worthy their attention.

\* It appears to range from 5s. 2d. to 6s. 5d. per yard.—Ed.



## CHURCH RESTORATION.

MR. C. HODGSON FOWLER, F.S.A., of Durham, lectured before the members of the Leeds Architectural Society on "Church Restoration: What to Do, and What to Avoid." There was a large attendance, and the chair was occupied by Mr. J. B. Fraser, F.R.I.B.A., the president.

At the close of his address, Mr. Fowler said:—He knew it was impossible in this busy century of ours, with the multiplied calls of work on a man, that he could give as much time as he would often wish to a work; but let them give all they could, and they would find that their care and diligence were reflected in those working under them. He was aware that his audience might find many works of his where he had done things he now condemned, but that he expected was the experience of most men, and in work such as he had been describing they sometimes suffered from the well-meant efforts of those working under them. Speaking of the "Society for the Preservation of Ancient Monuments," he said that that society, if its views were taken merely from its prospectus, or from the expression of some of its more moderate members, had nothing objectionable about it; but they must judge its views as enunciated by its principal originators and supporters, and it would, he thought, be found impossible to agree with them. There was no doubt that restoration had often been carried much too far. No one who had any feeling for old work, or who had seen any number of our old churches, could deny it; but, because we knew and lamented it, that was no reason why restoration should cease. The society appeared to forget that churches were built for Divine worship, and simply treated them as monuments. He declined to do so, and looked upon them, firstly, as God's houses, and to be kept in order for His honour, and that could, he believed, be done quite consistently with keeping all their historical and architectural interest. The members seemed to have no care for churches as such, and, therefore, he, as a Churchman, could not belong to it. But though he could not belong to the society, he denied that he was any more destructive than its members. On the contrary, he felt that restoration such as he had advocated was truer preservation than the society's "let alone" theory, which must end in destruction.

## MAGDALEN BRIDGE, OXFORD.

NOTWITHSTANDING the endeavours made, the preservation of Magdalen Bridge appears now to be hopeless. The following is a list of the tenders that have been delivered:—

T. Selby, Oxford .....	£16,469 0 0
T. Jones, Oxford .....	15,700 0 0
Kimberley, Banbury .....	15,461 0 0
Buxton, Heme-hill .....	14,809 14 10
Sym & Co., Oxford .....	14,487 0 0
Ottoway, Oxford .....	13,490 0 0
G. Jones, Oxford .....	13,132 0 0
Cook & Co., Battersea .....	11,443 0 0
Smith, Leamington .....	11,434 14 3
Hill, Gosport .....	11,200 0 0
J. Dover, Oxford .....	10,534 0 0
Richall, Bromsgrove .....	9,510 17 2
G. Moss, Liverpool .....	8,972 12 6

\* Under consideration.

Quantities were supplied. Mr. W. H. White, surveyor to the Oxford Local Board, is the engineer to the bridge.

## TOOLE'S THEATRE.

UNDER this title the rebuilt Folly, King William-street, was opened on Thursday last. We confine ourselves on the present occasion to saying that its architect, Mr. J. C. Thomson, A.R.I.B.A., has effected a surprising improvement in a singularly short space of time. The premises have been enlarged to the west and the north, and the general appearance of the interior is bright and effective. Messrs. D. G. Laing & Son have executed the building and the decorations (which include a new ceiling) from designs by the architect; Messrs. Battiscombe & Harris have provided the *carton pierre*, and Messrs. Strode the lighting. We cordially wish Mr. Toole the success he well deserves.

**Electric Bells.**—Messrs. Young & Buss, of Benham-street, New Bond-street, have just put a block of houses at South Kensington with their improved electric bells.

## PORTSMOUTH DRAINAGE COMPETITION.

THE arbitrators, Sir Joseph Bazalgette and Mr. Bailey Denton, have selected three designs in this competition to be submitted to the Town Council. They are marked "Miltum in Parvo," "M. M. L. C. E.," and "Delta," their respective authors being Mr. C. G. Adames, Borough Engineer, Portsmouth; Messrs. Quick & Son, Westminster; and Mr. Llewellyn Lloyd, C.E., London, formerly town surveyor, Bilston. The premium offered by the Corporation was 500 guineas.

## GAS-ENGINES.

OTTO V. LINFORD.

THIS was an appeal (heard before the Master of the Rolls and Lords Justices Brett and Holker) from a decision of Vice-Chancellor Bacon dismissing, with costs, an application made by the plaintiff for an injunction to restrain an infringement of patent, on the ground that the patent was anticipated, and the subject-matter of it published to the world in the specification of another patentee. He also intimated an opinion not favourable to the plaintiff on various other points which were the subject of discussion on this appeal.

The Master of the Rolls, in concluding an elaborate and lucid judgment, said:—The infringement is made out, and the decree of the Vice-Chancellor will be reversed, and the plaintiff will have his injunction, with costs.

Lords Justices Brett and Holker concurred. Judgment accordingly.

## THE NEW SYSTEM OF COMPETITIONS.

SIR.—Referring to my letter of Dec. 17th, published in your journal, on the subject of competitions, I think it desirable, in the interests of the profession, to call attention to the actual working out of the new system.

For example, the conditions, which have already been partially published, for the final competition at Glasgow, require a complete set of plans, to a scale of 1-in. to a foot, of each floor and roof, viz.: six plans, four elevations, two or three sections, one perspective view, making in all thirteen or fourteen sheets of drawings, each of which (excepting the view) will measure at least 3 ft. square; and all to be finished in pen and ink, partly coloured. In addition to these, plans of warming, ventilation, and sanitary arrangements will either have to be incorporated on the above, or separate drawings made. Practically at least 60 to 70 superficial feet of paper will have to be covered with elaborate drawing, for each set, and this has to be multiplied by ten.

It follows, therefore, that the architects will be put to this great labour and expense, merely to enable the council and assessors to arrive at a decision, the bulk of the work being simply an enlargement of what has already been before them. No reasonable objection could be taken to two or three plans, one elevation, and sections sufficient to show clearly what is intended (though even for these one-tenth scale would be ample); but no satisfactory system of construction, sanitation, &c., can be devised until the exact requirements are known, and the working drawings got out for execution.

Instead of reducing the labour and cost to competitors, the new system bids fair materially to increase it, as the Institute's recommendation to make a sufficient payment to cover the cost has not been adopted. Half per cent. to the successful man, and one to two per cent. divided amongst the unsuccessful, have been mentioned as a fair remuneration, but in this case the amount which the Glasgow Council propose to divide is not much more than half per cent. distributed equally amongst the whole ten.

A clause of a very one-sided kind has been introduced, by which, if the four selected competitors fail to obtain a tender satisfactory to the Council, they may each be superseded, which will render their position uncertain and unsatisfactory. In ordinary cases two and a half or three per cent. on the builder's tender would be due at a corresponding stage in the work, but the Glasgow Council would not be liable for more than 150*l.* to each of the selected men in their turn. Of course it is hardly likely to come to this, but the conditions are hard.

Do you not think, sir, that these circumstances would amply justify a firm, united, and respectful

protest to the authorities at Glasgow against such unreasonable requirements as they have, no doubt unintentionally and without realising the effect of their instructions, imposed upon the selected ten competitors?

OBSERVER.

## COMPETITIONS! COMPETITIONS!

SIR.—It is quite possible that the decision of the judges, *in re* the Blackfriars Bridge competition, was perfectly fair and equitable. But after that flourish of trumpets which invited artists to the tilt, would it not have been more satisfactory to the public if the public had been admitted to be spectators of the contest? There appears to be almost invariably a falling through in these enterprises. Is it the fear which ignorance in art begets that makes art committees utterly undecided and un-English in dealing with matters of taste? I fear that this must be the case, and that art committees are conscious that they do not know how to set about their work.

There is now another competition advertised for designs for the sculptures to decorate St. George's Hall, Liverpool. The advertisement embodies the usual stock uncertainties. Artists are invited to compete, and to send in twenty-eight designs half size,—that is to say, from 2 ft. 2 in. to 2 ft. 9 in. square,—which, as you must very well know, sir, would require, to do them roughly, at least six months of the artist's time,—and yet without the slightest guarantee that the successful artist's work shall be carried out; or if carried out, that he himself shall execute them. Nay, there is not even the promise that the works premiated shall even remain the property of the artist. Now, any set of designs of the given size, and worthy of being premiated, would, at the most moderate computation, be worth five or six hundred pounds. But, I maintain, that the time given, as was the case in the Blackfriars Bridge affair, is totally inadequate to do justice to such a set of designs.

Art committees that resolve upon opening a competition should go more systematically to work. The first thing which ought to be decided is the subject or subjects to be designed. There might even be premiums offered for the best suggestions, after which a mixed committee of literary men and artists might determine this point. There would then be fair ground on which artists would be invited to compete. What can come of competitions concerning which neither committees nor artists have any definite notions? The subjects being decided, even if the competition were not an open one, there would be some guide to a selection of artists.

DELL.

## A SERIOUS CHARGE.

SIR.—I have been for upwards of forty years a working painter, and also a foreman of painters and decorators round Belgrave, and I am still in the employ of a very old firm not far from that neighbourhood, and being a thoroughly practical man I wish to expose the following most abominable system which is now practised by two or three firms I know of. If the practice is not altered I will publish several handbills at my own expense, and expose the parties that are acting in this manner.

The firm I am now working for have a contract a few miles from town, supposed to have three coats of good oil paint and a flat, and to be completed in a workmanlike manner. It has been washed and had but one coat and considered finished. What are the surveyors about? Are they blind? Labourers are now employed by several firms to do what painters only can do, and the employers are thus robbed.

I think this, sir, will open the eyes of the right parties if you will kindly insert it. I will send you shortly another account respecting a job I am now conducting. Unless I make one coat do for two, my employer is not satisfied.

T. M.

**Value of Land at Chiswick.**—Mr. Walter Hall, land agent and surveyor, of 28, Southampton-buildings, Chancery-lane, has sold by private contract, for the sum of 11,220*l.*, the whole of the Duke's Avenue Estate, advertised for sale by auction. The property, which is situated close to Bedford-park, comprises seven acres of freehold land, and covers the whole of one side of the avenue. The price realised is said to be the highest yet paid in that neighbourhood.



## ROOF COVERINGS.

SIR—I am puzzled to know what sort of roof I should put up for a covered-in cattle-shed on a farm in the fen-land here (Boston), about six or seven miles from the sea, the country being very flat and low.

I at one time thought of using galvanised iron, but cannot assure myself of its durability under the circumstances that it has to contend against dampness internally and externally, as well as the gases, exhalations, &c., from manure and the dung of cattle.

The roof I wish to erect I want to resist wind-stripping, and which, in this neighbourhood, seems to be of frequent occurrence.

I should like to be informed of the merits and demerits of slated, iron, or other roofs under those circumstances, and I should be greatly obliged if I could obtain information respecting the same through your correspondence column, as well as answers to the following questions:—

1. What is the best roof to erect under the foregoing circumstances?

2. If slated, why? And what provisions should be made or precautions taken to insure its non-liability to wind-stripping?

3. If galvanised corrugated iron, state gauge recommended and what advantages it has over a slated or other kind of roof, and what length of life it would have under the above-mentioned circumstances?

4. What effect have dampness, gases, exhalations, &c., from the dung and excreta of cattle upon corrugated galvanised iron? Also state how they can be prevented.

5. Would you recommend or advise any other kind of roof? If so, why? And what advantage has it over any other? I remain, &c.

\* \* \* Our correspondent is unreasonable in his requirements; however, we give him the chance of a reply.

## SKILLED WORKMEN.

SIR,—I beg your kind permission to add a few remarks on the above subject.

Your correspondent, "Common Sense," attributes the cause of the existing state of affairs to the actions of the trade unions, and I am quite prepared to endorse his opinion, in so far that unionism has a great deal to do with it, and much to answer for, inasmuch as it certainly perpetrates, or at least aggravates, the evil, the primary cause of which, I think, is due in a great measure to the force of circumstances.

Take, for instance, a lad at the commencement of his career (I allude to the building trades). Suppose he is apprenticed in one of the branches, what are the chances in his favour in respect to learning his trade? No one needs to be told that the old system under which there were trade-masters in every branch, who invariably took apprentices that were legally bound to serve them, and they were equally bound to teach them their trade, has entirely disappeared,—it may be never to return.

These are superseded by the general contractor; but these are men of commerce, and have no opportunity, even if they had the will, to watch over the conduct of an apprentice and teach him a trade.

Moreover, a contractor, even if he has been trained as a practical workman,—some have not,—only knows one branch: then how could he teach an apprentice in any branch other than his own? Therefore it follows, as a matter of course, the lad would be placed in charge of the foreman; but this man has no personal interest, pecuniary or otherwise, in the lad, who, in turn, owes him no allegiance, and it would be a matter of surprise if the foreman took any pains to teach him; he would most likely leave him to the mercy of the journeyman, who having, if possible, even less interest in his welfare than the foreman, are less inclined to bestow any favours upon him.

Now, it requires no stretch of the imagination to picture the position of a lad under such circumstances, and to estimate the chances he has of learning his trade. It is more probable that when he has managed by hook or by crook to pick up a little smattering of his craft, he will take himself off, and his master would find it more profitable to let him go than to put himself to the consequent trouble and expense of forcing him back again.

It seems tolerably clear that the system of apprenticeship must, like the old trade masters, disappear altogether, and in its stead is springing up a sort of loose method by which so-called skilled workmen are "manufactured," if I may use the term. Doubtless, in some instances it is done in a fairly legitimate manner, and may bring some good results; but in the majority of cases lads or young men, whether mentally or physically adapted, or having any special taste for a particular craft or not, are, so to speak, smuggled into it; and in cases not a few, smuggle themselves into it. This kind of thing is well known both to employers and men, and winked at by all.

The greatest evil belonging to this method of manufacturing craftsmen lies in the fact that they are made too quick; they burst into full-blown journeyman by the time an indentured apprentice would have served half his term. And then it is

that unionism does its work upon these prematurely developed artisans; they are accepted as members of the lodge, are put on an equality with men some of whom are more than twice their age, and supported in their claim to be paid the full rate of wage, although in too many instances they are, in comparison, not worth more than half the amount.

Moreover, employers have largely contributed to this state of affairs; for, partly in consequence of the dictation of the unions, coupled with supineness on their own part, they have allowed to grow into an established fact a system by which all hands in each particular branch are without demer paid at a uniform rate of wage regardless of any classification as to degree in skill, something akin to dealing with a flock of sheep, but with this difference: in the one case the purchaser makes use of his experience in striking an average value, and the vendor finds it to his interest to get them into the best possible condition so that he may command the highest market price. On the other, the purchaser pays the highest average without regard to value, and the vendor has no inducement to improve the condition, i.e., "skill," because the price is secure beforehand.

This system is at once the strongest weapon in the hands of the unions; the greatest hindrance to advancement in the status in skill and industry, because it destroys emulation, which is the life and soul of progress; and is also downright injurious to the individual workman, who gets no more remuneration for diligence and superior practical knowledge than one who is deficient in both, and shows no disposition to apply himself to attain them.

ONE OF THE OLD SCHOOL.

## ELECTION OF BOROUGH SURVEYORS.

SIR,—I take advantage of the great circulation your well-known journal has among borough surveyors, &c., to appeal through it to them to see if some scheme can be devised towards placing the competitions for appointment to situations on a better footing. The town of Beverley advertised in your columns in the usual manner for a Borough Surveyor at 140*l.* salary. There were 102 applicants, four of them were selected to appear before the committee, who elected one; but at the Town Council, a few days after, he was displaced to make room for a personal friend who had not competed, being in a situation at a higher salary than that offered, and who would not have been allowed 3*l.* per year more than advertised. The above is but one instance out of many. Surely, when we consider the difficulty there is in procuring such appointments owing to the great competition, there might be some means taken to insure fairness at these elections.

SUBVETOR.

## VARIORUM.

COLBURN'S *New Monthly* (E. W. Allen), under the heading, "Great Companies and Trading Firms," contains accounts of the works of Messrs. Hooper & Co., coachbuilders, and those of Messrs. Cox, Buckley, & Co., church furniture makers. We take a paragraph from the former as to the woods used by the carriage-builder:—"Very elegant show-carriages are made in Paris, but many of them would in many cases suffer if taken off the smooth pavements of that luxurious and elegant city. English carriages, on the contrary, are built for use and comfort, and while no efforts are spared to render them shapely and elegant, the builder never forgets that they will have to travel over roads that are not as smooth as a billiard-table. No less than thirteen kinds of wood are used by the carriage-builder. Ash is to him of most value, next pine and mahogany, then elm and oak. Where there is much exposure to the moisture, sassafras is employed, as it offers more resistance to wet than any other kind of wood. From three to four years are allowed for the wood to season, and even then it is cut into small lengths, and put into racks for some months, before it is used. The 'body' is made by one set of workmen, the 'under-carriage' by another. The former is delicate, and the labour is not unlike cabinetmaking, while the latter nearer approaches carpentry. The manipulation of the panelling is one of the prettiest processes in carriage-building. Sometimes a panel several feet wide will be bent in such a way as to give two, three, or four distinct and graceful curves. It is done by wetting the wood on one side, and then exposing it to heat passing through an iron pipe."—We get the following graphic description of *Broadway, New York*, from "Cities of the World" for February:—"Broadway is the main street of New York, and the most brilliant thoroughfare in America. Indeed, it would be impossible to find in Europe itself a street which is characterised by such tremendous activity, such diversified and ambitious architecture, and such an air of metropolitan splen-

dour, wealth, and life. The great avenues of trade which run from Trafalgar-square or Hyde Park to the Royal Exchange, the arcaded lines of the Rue de Rivoli, the busy Graben of Vienna, the Via Roma of Naples, none of these can sustain a comparison with the grand artery of the New World, through which course from sunrise till evening strong currents of the most electric life of the nineteenth century. The noble width of the street, so favourable to architectural effects and long vistas; its great length, of fully five miles, nearly one-half of which is absolutely straight; and its central position on the island, with long streets, crowded with stately buildings, diverging on either side: all these are the advantages of position, which serve to set off to the best advantage the cosmorama of humanity which continually surges along the pavements. Broad as the roadway is, so great are the numbers of carriages, omnibuses, and wagons always in motion there, that it becomes an affair of no small peril to cross it, and the most stalwart and handsome officers of the police force are stationed at the corners to escort ladies from one side to the other. Some years ago an iron bridge was thrown over Broadway, near Fulton-street, so that pedestrians could cross in safety. Never was there such a heterogeneous architecture as is here displayed, where the Greek and the Gothic, the Romanesque and the Renaissance, are crowded side by side, but all in a manner harmonised by the distortions which the urban architects of America are forced to plan in order to insure the three prime essentials in a modern building,—light, air, and space. New York dilettanti ruefully recall Mr. Ruskin's celebrated dictum (*Fora Clavigera*, No. 1) that before the science of building can become respectable on this continent, their city must be razed to its foundations. The classic harmony of Pall Mall, the restful uniformity of the Parisian Boulevards, are lacking here, where all is strongly individualised, and the narrow shop-fronts along a single square exemplify every style and colour. Iron is largely used as a building material, and long colonnaded façades, simulating marble or brown stone, are composed of iron castings riveted together. The colossal hotels, rivaling the Midland or the Parisian Grand; the newspaper offices, dwarfing the High-street of Edinburgh, with their ten and twelve stories of altitude; the banks and insurance buildings, of marble, granite, iron, in transformed architecture of Palladio, of Viollet-le-Duc, of Yankeeism undisciplined; the shops and warehouses, sometimes larger than Roman palazzi, and replacing their dead walls with wide expanses of glass: all these follow each other in bewildering succession, with their unceasing roar of the street between, and their vivid blue sky overhead."—The Clarendon Press will publish very shortly a "Treatise on Rivers and Canals, relating to the Control and Improvement of Rivers and the Design, Construction, and Development of Canals, by Mr. L. F. Vernon - Harecourt, M.A., C.E." The author describes the physical characteristics of rivers; the method and formulae for measuring their discharge; and the various works, structures, &c., for improving rivers and forming canals. The causes and means of prevention of floods in river valleys are also discussed.—The touching story of Mrs. Hemans's devoted life, in connexion with her poetic gifts, as the "Songstress of the Household," will be told in the March number of the *Quiver*. The paper, which will be suitably illustrated, is from the pen of Mrs. Raymond Fittman, author of "Heroines of the Mission Field," and forms one of a series of charming sketches of "Consecrated Womanly Genius."—Mr. Thomas Burt, M.P., whose practical acquaintance with the subject is well known, will contribute a paper on the "Tyne-side Collier, at Work and at Home," to the forthcoming number of *Cassell's Magazine*.

The Lyceum Theatre.—The Building Act Committee of the Metropolitan Board of Works have reported the receipt from the Superintendent Architect of the Board of a report, accompanied by plans, as to the present arrangements for the egress of the audience from, and the prevention of the spread of fire in, the Lyceum Theatre, and the improvements which it was desirable to effect there; and recommended that the matter should be referred back to the Committee, with power to act, with a view to the Solicitor taking the necessary proceedings to enforce the provisions of the Metropolitan Management and Building Acts Amendment Act, 1878. The report was adopted.



## Miscellaneous.

**Fatal Building Accident in Oxford-street.**—Dr. Danford Thomas opened an inquest on Tuesday at the Middlesex Hospital respecting the death of George Carter, aged 18, who was killed on Friday, the 10th inst., by the fall of a staging at the corner of Thomas-street, Oxford-street. The premises on which the deceased was at work are being built on land the property of the Duke of Westminster, from plans prepared by Mr. J. S. Moye, architect, for Mr. Hollis, a pork-butcher, who acts as his own builder, and employs as his foreman Mr. William Riddell, under whose superintendence the staging was erected. Riddell and other witnesses said that they considered the timber of which the scaffold was constructed to be good, but Mr. William Niblett, a builder and contractor, said that in his opinion the timber used was unsafe, and that the construction of the staging was imperfect, and was not calculated to carry the weight of bricks placed on it. The inquiry was ultimately adjourned for further evidence. From inquiries made on the site of the accident, we learn that the portion of the staging which fell was about 12 ft. long and 11 ft. wide. The platform, consisting of 9 in. by 2 in. planks, was carried by cross joists resting on horizontal timbers. These joists had a bearing of about 10 ft., and were six in number, five being of 7 in. by 3-inch scantling, and one 6 in. by 6 in. These were placed about 2 ft. apart from centre to centre. Not long before the accident occurred some bricks had been stacked on the staging, there being, we are told, about 4,000 bricks on the platform, or about 8 tons in weight, at the time of the accident. The foreman having noticed that some of the joists bulged a little, he instructed the deceased to put in a strut or two under them. Before this could be done, however, the joists gave way, and the deceased, who was taking measurements for the struts, and a labourer who was engaged in screening sand, were unable to escape from under the staging. The labourer's injuries were not very severe.

**The Smoke Abatement Exhibition.**—On Saturday afternoon last a number of the members of the Royal Institute of British Architects visited this exhibition, which was closed on Tuesday last, when the exhibitors held their final meeting. Mr. Ernest Hart, who occupied the chair, said the sole object of the exhibition had been to solve the problem of how to abate the smoke nuisance. They could not pretend that that problem had been entirely solved by anything seen at the exhibition, but it showed, both as connected with private houses and with every variety of industry, that smoke was capable of being abated. Reporters had been sent to the exhibition by the following Governments:—France, Germany, the United States, Switzerland, Austria-Hungary, Prussia, Sweden, Denmark, the Netherlands, China, Canada, and Australia. Mr. Shaw Lefevre, the First Commissioner of Works, had caused several of the exhibits to be purchased for trial in the public offices. The total number of visitors to the exhibition had been 116,000. Of these, the larger proportion had had free admissions presented to them. As to the receipts, they amounted to quite as much as the committee had expected they would. The testing of exhibits alone had cost 1,000l., or nearly that amount; and when everything was paid, he expected the funds would be at least 800l. deficient. They would, however, know how to meet it.

**Bad Building Materials.**—At the last meeting of the Metropolitan Board of Works, the Building Act Committee recommended that the Vestry of Paddington, in reply to their letter requesting the Board to take the necessary steps during the ensuing session of Parliament for obtaining powers to prevent the use of road scrapings, road sweepings, or slop, in the building or internal plastering of new or altered houses, should be informed that the Board would note the communication in the event of further legislation, but that it could not be dealt with in the present Bill before Parliament, as the notices required by the standing orders of the House of Commons which had been sent out did not allude to this subject.

**The Marquis of Londonderry's Stables in Mayfair.**—To the description of these buildings given on p. 143, *ante*, we are requested to add that 144 yards superficial of the flooring (on the first floor) were laid with "Brunswick Rock Asphalt Paving," under the personal superintendence of Mr. William Hirst.

**Liverpool Art-Club.**—A *conversazione* was held on Monday evening at the Liverpool Art-Club, Upper Parliament-street, at which several hundred ladies and gentlemen assembled. Mr. Benson Rathbone presided. There was a paper read by Mr. A. H. Mackmurdo, A.R.B.A., on "Architecture and its Influence." In the course of the paper the lecturer said that architecture at the present day was only just awakening from a sleep in which it had been wrapped for well nigh 200 years. Building, however, was awake and active, and the result was what they saw and deplored. Speaking of the mission of architecture, he said that its first and most important work was to house the citizens of a State; next it had to provide the buildings required by a people for its commercial business; and last, but not least, buildings for their common worship. It had, in its higher uses, to express and minister to the unity and domesticity of the family, the stateliness of our civic life, and the supremacy of our political relations. From this, its great necessity and consequent dignity, architecture had always held the chief place among the fine arts. It had, of all the arts, undoubtedly the widest appeal and the largest destination, and required in its production the greatest combination of human faculties. A cordial vote of thanks was passed to Mr. Mackmurdo, upon the motion of Mr. Philip Rathbone.

**Property at Fulham.**—In the Sheriff's Court, Red Lion-square, a few days ago, before Mr. Under-Sheriff Barchell and a special jury, the case of Harri and others, v. the Guardians of St. George's Union was heard. This was a claim to compensation on the part of the owners of certain undivided moieties in premises and land, situated in the Fulham-road, required by the Guardians for the construction of their work-house. Mr. V. Brockland estimated the value of these properties, including 10 per cent. for forced sale, at 10,131l. 10s.; Mr. E. Tawson, at 10,009l.; and Mr. W. Rex, at 11,233l. On behalf of the Guardians, Mr. Spencer Chadwick was called. His figures gave a total of 5,150l. Mr. F. T. Galsworthy put the value of the properties at 5,777l. The jury, after a short deliberation, gave a verdict for 8,000l. The Under-Sheriff: Then by consent the judgment will be for a moiety, 4,000l.

**The Berlin Hygienic Exhibition and Theatre Architecture.**—The *National Zeitung* of Berlin announced some time ago that the committee of the above exhibition had expressed its willingness to receive models and plans tending to promote the security of theatres against fire. It was, however, subsequently decided that the best way to secure the result aimed at was the opening of a competition with a view of arriving at the best principles for adoption in the building of theatres. The funds of the exhibition not allowing the committee to offer pecuniary rewards, an appeal has been made to those interested in the question, to show their appreciation of its importance by contributing to the object named.

**Cambridge Slade Professorship.**—At a meeting of the electors of the Slade Professorship of Fine Art, Mr. Sidney Colvin, M.A., Fellow of Trinity College, was re-elected Professor for a further period of three years. The Professor is required to give annually to the University, in full term, and free of charge as regards members of the University, a course of not less than twelve lectures on the history, theory, and practice of the fine arts, or of some section or sections of them. He is not required to reside in the University. The stipend of the Professorship is about 360l. per annum. Mr. Colvin was first elected Professor in 1873, in succession to the late Sir Matthew Digby Wyatt, and is now elected for the fourth time.

**Proposed Statute to Carlyle.**—At the meeting of the Metropolitan Board of Works, on the 10th inst., a letter was read from the Rev. G. Blunt, rector of Chelsea, and Mr. H. B. Mitford, secretary to her Majesty's Office of Works, stating that a Committee were desirous of erecting a statue to the memory of the late Thomas Carlyle on the Chelsea Embankment, immediately opposite to Cheyne-row, and asking the Board to give their sanction to the proposal. The communication was referred to the Works and General Purposes Committee.

**Eaton Hall.**—According to the *Athenaeum*, Mr. Shields has just completed some important stained-glass decorations for the chapel of Eaton Hall. They are intended to illustrate the "Te Deum." These windows have been executed, under the designer's direction, by Messrs. Heaton, Butler, & Bayne.

**Staverton.**—Progress is being made in the restoration of the church of St. George at Staverton, near Totnes. The chancel was renovated some few years ago, and now, under the direction of Mr. Ewan Christian, architect, and mainly at the expense of the Ecclesiastical Commissioners, the nave and aisles are assuming a more seemly appearance. The "pews" are all swept away now, and new open benches are in progress. The general contractor is Mr. Evans, builder, of Paignton. The restoration of the old rood-screen has been entrusted to Mr. Harry Hems. This screen was erected in the fifteenth century, and is of oak. It measures over 50 ft. long, independently of its two handsome parclose. A solid moulded oak sill is being put through the entire length, and the upper parts are being tenderly carved for. Mr. Hems has also the restoration of the old Jacobean pulpit and prayer-desk in hand.

**Stone Circles.**—At the fifth meeting of the British Archaeological Association, the first paper read was on the Stone Circles at Duloe, Cornwall, by Mr. C. W. Dymond, F.S.A., and it was illustrated by a carefully-prepared plan of the remains from an actual survey. The circle has been described by various writers, with but little regard to accuracy. The dimensions are small, being but 44 ft. from stone to stone in the greatest diameter, and there are but eight stones, the dimensions of each being given in exact detail. The site is an elevated one, and the pure white material of the stones must have made the monument a very visible object when the country was more open than at present. There is no appearance that the stones were ever covered over by a mound, as is the case with similar stone circles elsewhere.

**A National Museum of Hygiene in America.**—The Surgeon-General of the United States Navy, in a circular letter of the 10th inst., calls attention to the establishment of a National Museum of Hygiene at Washington. The museum, says the *American Sanitary Engineer*, is designed to illustrate the progress made in this country in all departments of hygiene; and architects, manufacturers, physicians, inventors, and others interested, are desired to contribute to the collection articles, models, drawings, or descriptions of any appliances or methods for improving the general sanitary condition. The museum has been made the central depository of the American Public Health Association.

**Canvassing Prohibited.**—At a recent meeting of the Metropolitan Board of Works, the Building Act Committee reported that they had carefully considered the question (referred to them by resolution of the Board) of the desirability of permitting candidates for vacant district surveyorships to continue the system hitherto in vogue of personally canvassing the members of the Board, and they were of opinion that it was undesirable that candidates for the office of district surveyor should personally canvass the members of the Board. The report was adopted.

**Messrs. Robert Boyle & Son** are at present applying their air-pump ventilators and system of ventilation to the Council Chamber at the Guildhall. Many ineffectual attempts have been made to ventilate this building, and the results of Messrs. Boyle's efforts will, no doubt, be looked forward to with interest by architects, especially when it is mentioned that the patentees have guaranteed complete success. The system is also at present being applied to Normanshure Court, the residence of Sir Thomas Brassey, M.P.

**The late T. S. Robins.**—The works of this artist (a late member of the new Society of Painters in Water Colours), comprising views in England and Wales, Holland, France, Belgium, Germany, Switzerland, and the Rhine, and a large number of admirable sketches of shipping and craft of the past, will be sold on Feb. 23, at Messrs. Christie's rooms.

**Brockham.**—On Thursday, the 9th inst., the Brockham Brick Company entertained their permanent staff at the Harley Mow, in Betchworth-street. About sixty men sat down to supper, under the presidency of Mr. Alfred Bishop, the secretary, supported by Mr. Manwell. "The Company" was toasted with enthusiasm, and the cordial spirit displayed augurs well for its future.

**Clerkenwell Parish Church.**—It is proposed to restore the ancient church of St. James, Clerkenwell, and already a handsome sum has been subscribed for this purpose.



Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.



# The Builder.

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SATURDAY, FEBRUARY 24, 1902.

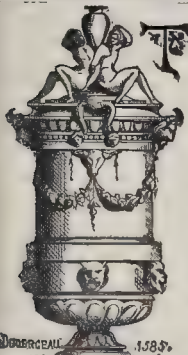
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### Greek and Roman Sculpture.



THE production of a tolerably large and profusely illustrated volume, designed as a popular aid to the study of Classic sculpture,\* may, we hope, be taken as a sign of an increased interest in this form of art, as well as a means of increasing and directing that interest. Certainly it is not many years since

the production of a popular treatise on the subject, on this scale, would have been considered a hopeless venture by authors and publishers equally, and even now a work on such a subject is not likely to attract half the interest which an equally competent work on the history of painting would evoke.

The consideration of the causes of this limited interest in sculpture in modern times forms a kind of complementary problem to that opposite one, as to the causes of the great interest in sculpture among the Greeks, and their unequalled success in the art. The influences which were notably present in favour of the development of sculpture among the Greeks, we should expect to find notably absent in our own day, when, as Mr. Perry says, even the sculptors themselves admit the comparative failure of their art. Part of the book before us being directed to the consideration of the influences which operated in favour of antique sculpture, readers may thence be able to deduce an idea of the causes which operate against it in modern times, and thus draw a double lesson.

The object of the author, as set forth in his preface, is not only to furnish the amateur with the knowledge necessary to enable him to understand and appreciate the remains of ancient sculpture in museums, but also to set before the artist the principles by which the greatest masters in the greatest period of the art were guided, "and to direct the attention of the student of ancient history to one of the most interesting and characteristic sides of Greek life, and to show him the intimate relation between Greek art and the religious, political, and social life of the Greek people."

This is a tolerably ambitious programme, it must be admitted, for one writer to propound in one volume, even though a bulky one. As to

the questions involved in the principles of sculpture, we cannot find that these are anywhere systematically or fully treated of, the few reflections which bear on this part of the subject being for the most part introduced rather at hazard and in an unconnected way. The Introduction gives, in a connected form, the author's own ideas as to the rationale of sculpture, which, as far as it goes, we regard as perfectly sound and true. He brings into prominence the fact that sculpture, of all the imitative arts, is, or should be, the least realistically imitative. It "must rest on a careful and comprehensive study of the structure and forms of living men. Yet here, again, we must repeat that a statue is only a work of art, in the higher sense, when it is the embodiment and representation of an art idea. The sculptor studies the forms and motions of a thousand living men, but he copies no one of them. He is able to conceive and to create a form which is far above his actual experience, and which he uses as the fitting expression of his sublime thoughts. The natural world produces nothing in absolute perfection,—not a leaf, not a flower, not one of the infinite variety of living animals, not a man, not even a woman." This latter proposition is too strongly put. Nature certainly produces perfect forms occasionally in animals, and in men and women. As a rule, no doubt, a sculptor has to modify his model, by drawing on his own acquired knowledge derived from the general average of types, in order to realise the beauty which he seldom sees before him in visible form. But there are other reasons for modification besides this. Too minute realism in sculpture would tend to failure, simply from suggesting an aim which cannot be attained where modelling only can be imitated, without texture or colour. The painter may aim at realism, for he has all, or nearly all, the materials and conditions for it; the sculptor has not, and absolute realism in modelling only draws attention to the impossibility of realism in other particulars. The balance in the relation of the copy to nature is thus destroyed. And considering that the highest mission of sculpture lies in giving form to ideal conceptions, too minute realism is also injurious to the ideal effect aimed at, as drawing the eye too much to minutiae at the expense of the unity of the conception as a whole. Any one who has seen a figure modelled from the life in clay with the greatest possible realism must have felt how some of the minutiae of modelling, the small folds and creases of the natural body, interfered with the statuesque effect of the figure as a whole, and why such minutiae require to be smoothed and refined away before the highest sculptural expression can be realised. In another part of the book the author quotes Cicero as giving evidence of a recognition of the same principle; though only introduced as an illustration in one of his orations, the passage is not the less significant of the manner in which the art was then regarded

by a highly cultivated and gifted man who was not an artist. Cicero's words are, "The great artist, when he was moulding his Jupiter or Minerva, was not looking at any form of these deities of which he might make a copy, but there dwelt in his mind a certain form (*species*) of surpassing beauty, the sight and intense contemplation of which directed his art and his hand to produce a similitude." It is when considered in this light that sculpture is, or ought to be, a kind of antidote to the too prevalent realism of other forms of art at the present moment; a realism which has unfortunately too much invaded modern sculpture also, and brought it in some instances to most prosaic and even absurd manifestations.

In early sculpture the avoidance of realism of detail, invariably to be observed, would be the result of no principle, but simply of inability to model with the freedom and minute elaboration only attained in times when greater facility of execution had been, as we might say, inherited from one generation to another. The selection of what is suitable for sculptural treatment, and the rejection of what is not, then comes into operation as a portion of the æsthetic of sculpture; of the exercise of this careful intellectual selection we see evidence among all the works of the great Greek period. The distinction between this intentional and critical discernment as to the limits of the art, and the merely unconscious conventionalism of earlier and less complete periods, may be traced in all forms of art dealing with the representation of the human figure; but it is often quite overlooked, and we are called upon to admire the superior judgment of the artists of the imperfect period, for results which are really only due to their inferior powers of execution. Deficiency of technical skill keeps the earlier practitioners of an art well within the bounds which are proper to the expression of that art; over-refinement in technical skill tempts the latest school in the same art into going beyond those limits in order to show their technical skill, at the expense of the highest and most characteristic expression. This is nowhere more evident than in sculpture, partly because in this art the conditions of success are more limited, and their transgression becomes more notable. Nothing, however, that can justly be called a degradation of sculpture occurs in late Greek or late Roman art, so far as we know it. The achievement of this "bad eminence" was reserved for late Renaissance and modern Italian sculpture. Considering the time covered by Greek and Roman sculpture, as illustrated in the book we are now speaking of, it is remarkable how slight is the decadence in the æsthetic ideal of sculpture, though the declension in dignity and completeness of style is marked enough. If we compare with this very gradual decadence of Classic sculpture, the rapid down-hill path of Renaissance sculpture; if we consider the immense gulf which separates Bernini from Donatello,

\* "Greek and Roman Sculpture," a popular Introduction to the History of Greek and Roman Sculpture." By Walter Copland Perry. With 468 illustrations on wood. London: Longmans, Green, & Co., 1892.



artistically, and the comparatively brief time in which this defection was brought about, we must conclude that there was in Roman art a greater soul of goodness than is sometimes admitted, for their sculptors to have kept, for so long a period, so creditably near to their great Greek models.

The account given by Mr. Perry of the earlier stages of Greek sculpture, as far as they are known, is very clear and readable, and very fully illustrated. In speaking of the lions of Mycenæ, however, Mr. Perry conveys to some extent a wrong impression in describing the column between the animals as very un-Greek in character, and hardly assignable to any known style. Professor Lewis showed, not long since, in a communication in our columns, the almost precise identity of the mouldings at the top of the sculptured columns with the usual Attic base, only that the feature is inverted, the whole column appearing, indeed, as a column with its base uppermost and the necking at its foot, but no capital. The inversion of the column is a very curious and inexplicable fact; but the resemblance of the mouldings to the Attic base is far too close to be accidental.

A large space is devoted, naturally, to the Parthenon sculptures, the majority of which are reproduced in small but careful outline. In regard to the Pantheon frieze, Mr. Perry draws attention to a peculiar detail often overlooked,—the carefully contrived "isocephalism," or ranging of the heads of all the figures at about equal height, which is kept up throughout it, and is to some extent a characteristic of frieze sculpture. Mr. Perry attributes this arrangement to certain considerations in regard to the conditions of bas-relief, arising from the absence of real background in the case of true bas-relief figures (i.e., figures in which the relief of the modelling is apparent rather than real), which necessitates the covering of the whole space with the figures. This seems to us a very roundabout and unsatisfactory explanation, as, after all, there is an appreciable extent of the ground unoccupied in the upper portion of the Parthenon frieze. The reason for keeping the heads level we take to be the desire to bring the frieze into proper decorative relation with the lines of the architecture, by preserving a horizontal level in the disposition of the figures. The ingenuity with which this is done causes the anomaly to pass off without notice in the case of many spectators, who do not perceive, till their attention is called to it, that the men on horseback rise no higher in the line of heads, or scarcely higher, than those on foot. The employment of a small scale for the horses, and to some extent a manipulation of scale and proportion in the riding figures, are the means taken to procure the desired result, which is certainly a gain in the decorative or architectural effect of the whole frieze. Let any one even mentally contrast the effect if the heads were at different levels, and the superior result of the actual arrangement, in relation to the building, will be obvious, though it is obtained at the expense of a curious falsification of scale in the sculpture.

Mr. Perry draws attention to differences of merit in the execution of various figures in this frieze, which, of course, cannot have been executed by the hand of one sculptor. He finds a difference in the horses on the south and north sides; the former, which were less seen by visitors, being executed with less care than those on the north side. Such is the author's conclusion, which we rather question, and which is at variance with other facts in connexion with the Parthenon sculpture. The fact, for instance, that all the figures of the tympana are finished as highly and completely in the back portions, which no one could ever see after the figures were *in situ*, seems quite at variance with the idea that the side of the frieze which would be perfectly visible, though likely to be less looked at than the other, should have been wilfully allowed to be carelessly executed. If the difference is there, we must trace it to accidental causes. The lesson to be learned from this frieze, in reference to modern sculpture, is plain enough, though very discouraging. Mr. Perry sums it up very well. The work exists before us, as he says, "the very form and spirit of Periclean Athens." From the gods of Olympus to the dumb animals that were sacrificed; "from the Archon and Eupatrid to the charioteer and slave-groom, all are there." There were the noble youths of "horse-loving" Athens, and the train of high-born Athenian maidens, with modest mien and gentle dignity and grace. "All that

was sacred, powerful, and grand, all that was beautiful, graceful, and joyous in Athenian life, is represented there." The author calls the representation "idealised," but conventionalised would be the true expression. The forms are to some extent modified,—the animals especially,—for treatment in architectural sculpture, but, in the main, the whole representation is realistic in intention, as far as the conditions of bas-relief sculpture allow. And it is when thus regarded that it speaks to us of some of the reasons of the great success of sculpture in ancient Athens, and of its non-success in modern life. The Athenian everyday life was beautiful and graceful in its usual manifestations: ours is not. Many critics and artists have recognised plainly enough the naive and realistic character of the Parthenon frieze, and have proposed that subjects and incidents of the present day should be sculpturally treated on our buildings with the same realism and *naïveté*, as if the same method which produced the beautiful Greek sculpture would produce beautiful English sculpture. And yet no one, we imagine, has ever followed up in his mind the result which such a sculptural treatment of modern life would present, without being made to recoil by a feeling of the ridiculous side of such a representation. The difference is that natural everyday Greek life was graceful and beautiful, and had, in its simplicity, the true elements for sculptural subjects; that everyday English life is mostly not graceful and beautiful, and that, where it is, the grace and beauty are so artificial and (both in a material and metaphysical sense) so heavily draped, as to be quite unavailable for the purposes of sculpture. Painting may do a good deal with modern life; sculpture is nearly powerless in its presence, not to say contemptuous.

In speaking of the recently-discovered Olympian statues, Mr. Perry strongly decries the exaggerated statements made as to their surpassing excellence, "that they were fully equal to the Elgin marbles," &c. The enthusiasm of discoverers over their discoveries is natural, and, to a certain extent, contagious, but it must not be allowed to override true and judicious criticism. The gap between the Olympian and the Parthenon sculptures, except in regard to one or two figures of special excellence among the Olympian set, is very marked. The Olympian sculptures have somewhat of the character, as compared with the Athenian, of archaic art; a large and grand manner they show, no doubt, but great inferiority in regard to refinement of execution and life-like character and expression. In regard to the Parthenon sculptures, the author refers again to the old vexed question of Lord Elgin and the morals of his raid on the Parthenon: he sums up, as we think every person in whom sentiment does not override practical common sense must do, in favour of Lord Elgin, whose action, by whatever motives prompted, unquestionably was the means of preserving and giving to all the civilised world the greatest works in the world's sculpture, which would otherwise before now have perished, or nearly so, under the hands of brutal and ignorant spoilers.

In treating the later developments of Greek sculpture, the author brings out, whether intentionally or not, points offering a remarkable parallel with some of the tendencies of modern art at the present moment. The school of which Praxiteles was the centre he describes as one devoted to "the Aphrodisian cult," the school which drew its models from the superior class of *Hetairai* (women of loose character), who filled so large a place in later Greek society. The *Hetairai* did not gain a large or general influence in Greek society till after the Peloponnesian war. "Such a scene as that recorded by Athenæus, who relates that Phryne, letting down her hair, descended into the sea before all the Greeks at the public festival at Eleusis, would have been impossible at any earlier period, and clearly shows to what an extent the worship of mere beauty had lowered the tone of the national morality." Praxiteles became accordingly the highest representative of a school of sculptors who aimed at the realisation of a graceful seductive beauty in their works, with much less grandeur of style than in the Phœidian age, and with no elevation of feeling whatever. Without necessarily drawing the social parallel, we certainly seem to see something of an artistic parallel in the works of a sect of artists who at present seem to have set up a kind of Aphrodisian cult, a *perichoresis* for languid, unintellectual, sensuous forms, deficient both in artistic and moral force of expression.

It is significant to remember that this tendency in art was, as we can now see, the accompaniment or sign of the decadence of Greek art and society. In the present day it is put forward by its votaries as part of the revival of art (about society they care little); with how much truth time will show.

The period to which most of the Roman works of sculpture with which we are acquainted belong is called by the author a "period of imitation," and that is probably about the truth of it. We have to be grateful, however, to this art of imitation for having preserved to us what appear to be good copies of some great Greek works, the originals of which we should otherwise know of only by description. The Roman influence upon Greek sculptors of the Roman period Mr. Perry thinks was ("strange to say," as he adds) both healing and elevating, in the century before and the century after Christ. "The Romans had not yet lost their faith in the gods, nor the sense of personal dignity which accompanied that faith. They wished to see both the deities whom they worshipped, and the chiefs whom they obeyed, represented in the severe and dignified forms of antiquity. The *dei majores*—the Jupiters, Junos, and Minervas,—became once more the subject of plastic art, and the artist prepared himself for his arduous task by the study of Phœidian and Polyceian. He went far up the stream of Grecian art and drew from its yet unpolluted waters. And hence the phenomenon that some of the finest works which have come down to us are just from this late period, and that we see in Rome a sort of after-glow of the hey-day of Attic sculpture." "Hey-day" seems a peculiarly unfortunate and undignified expression to use in connexion with such a subject, but the view stated is, we imagine true, and it affords an interesting example of the influence of religious and social conditions upon the arts. Of the Venus de Medici even, while recognising it as in the main a purely sensuous work (and probably a Roman reproduction of the idea of the Cnidian Venus of Praxiteles), the author can afford to speak very kindly, observing that "even at the lowest estimate which the coolest critic can form of the Medician Venus, how favourably does she, in her refined and 'innocent voluptuousness,' contrast with the goddesses and nymphs of many an illiterate painter of the Middle Ages, and with the moribund minxes of some modern schools of sculpture." And this is true enough. And yet there can be little doubt that the Medici Venus was produced in a society to which the worst social abuses of this day are comparative purity. Perhaps Mr. Perry's footnote supplies one explanation,— "The modern Venus, in too many cases, is not moulded and painted by nature, but by bastard art with the aid of corsets and cosmetics." That is part of the secret. There was at least a more natural and healthy costume in those days, and the human form was not pinched and pulled out of shape.

We must refer the reader to the book for further considerations of the subject. Mr. Perry has filled a gap in what may be called the higher-class popular literature of art, and filled it exceedingly well.

#### THE MUNICIPAL GOVERNMENT OF PARIS.

No one can visit Paris, be he ever so noblesse, without being struck, after a very few days' stay, with the magnitude of the cost at which the order he sees about him must have been obtained. It is true, the stranger is kept more within certain limits specially prepared for his reception than he is in London, the enormous size of which would, we suspect, almost baffle even French powers of organisation; but while, unquestionably, considerably larger sums are expended on the "strangers' quarter" in Paris than is the case in more distant neighbourhoods, the system by which the whole is regulated is the same for all, and the general expense of the whole is shared by all, just as the enjoyment of the more decorative parts of the capital is open to all, though it may be remarked that there is not such an absence as is at first apparent,—always excluding certain terrible neighbourhoods,—of beauty and charm in the less stranger-frequented portions of Paris. There are to be found the same tall stone houses, the same pretty squares open to the public with their Sunday bands of military music, the same green gardens, round the statues



and fountains of which the children play; there are the same tree-planted streets and boulevards, with their welcome well-shaded seats; the same kiosks, the same well-supplied markets that are to be found in the better neighbourhoods. And again, always excepting certain miserable parts of the capital, every "apartment" in Paris has its *cabinet noir*,—there are not to be found, as with us, those differences so marked between one neighbourhood and another; a blessing which may, to some extent, be attributed to the central form of government which Paris enjoys, distributing with more or less equality over each portion of the capital the advantages specially enjoyed by those fortunate enough to occupy the more expensive neighbourhoods. Of the central form of municipal government we may premise one more remark, omitted in referring not long since to the government of New York, that the peaculation and jobbery with which stand accused the officials of the Empire city, are solely due to the indifference of the ratepayers in the election of their town councillors. It is well known that it is alone owing to this acknowledged fact that the central government of New York State, held at Albany, refuse to leave the municipality of New York (city) its entire liberty. A representative form of government, when honestly exercised, affords the surest means of effecting whatever may be the expressed desires and needs of the majority. It is by the exercise of these their rights, let us repeat, that the Parisian ratepayers have effected the results which, when the stranger visits Paris, he is forced to admire.

Having in a former article\* explained to some extent the nature of the municipal government of Paris, we may now, in accordance with our promise, proceed to deal more specially with the action of the various commissions with which lie, as with our own London Corporation and those of every city in the world, the expenditure of the annual budget. First among the expenses of this budget comes the item for the police. Of the police of Paris, so important a factor in the government of the city, it is difficult in the limits of a few lines to speak fully,† it may, however, be said that, generally speaking, the Paris police, except that its organisation is more masterly, resembles greatly that of London or of any other great city. It is an old complaint that the species of suspicion, chiefly political, with which everybody is regarded,—this feeling, fortunately is daily diminishing,—leads to an amount of inquiry and prying that to the Anglo-Saxon is singularly offensive and which is happily scarcely known in England and America. It may be stated that there are some 8,000 policemen and seventy *commissaires* distributed through the eighty *quartiers* of Paris, with, of course, a large body of police officials. The Prefecture of Police costs yearly some 800,000*fr.*, half of which is paid by the Government. The Prefecture of Police consists, it may be stated, of three *bureaux*, subdivided, of course, into numerous other *bureaux*. The first deals solely with political affairs, secret societies, public meetings, Masonic lodges, refugees, and lastly, the strangers, the presence of each of whom on his first arrival in Paris is, as is well known, reported immediately to the police, who docket his name for future reference. The second bureau deals more particularly with the public amusements, fêtes, reviews, races, theatres, &c. though it may be mentioned that the theatres in Paris are not put in charge of the police, but of the *Garde Républicaine*, another important branch of the Paris police, though in reality part of the army, remaining, however, always in the capital. The third bureau deals solely with the foreign and French journals, the translation of documents, telegraphic messages, &c. The systematic arrangement of the whole French police is a marvel of organisation, to describe which alone would require considerably more space than is at our disposal, or than the subject in its relation to the municipal government of Paris requires. As for the Fire Brigade of Paris, admirable as is its management, its small number of men, barely 2,000, distributed over eighty fire-stations, is very far, Parisians freely admit, from being what it should be. Paris, it is true, is freer from fires than London and other cities, owing to the strength and solidity of its stone buildings, the tenure allowing of building almost for eternity in Paris; but several fires that have recently occurred have

shown sadly the deficiency of the Paris Fire Brigade, though Paris pays for its protection over 70,000*fr.* Captain Shaw has constantly complained that the 30,000*fr.* which our London Fire Brigade costs us is miserably insufficient.

Paris, until within a few years, was very insufficiently supplied with water,\* but within a generation the efforts made in this direction have remedied an inconvenience, which still, however, requires further consideration, the pending settlement of which almost renders any statement at present useless. The municipality are discussing this all-important question, the separate supply of water to the capital for each of the great services, the household use, and the public use in the streets, fountains, drains, &c. Suffice it to state to those whom it may interest that it is calculated that something like over three million *litres*, about 700,000 gallons, of water *per diem* are supplied, a third of which is used for household purposes, the remaining two-thirds for the public service, watering the streets,—down each side of which is kept flowing during some hours in the day a constant supply of water,—flushing the drains, &c. This, we hope, may dispense with any detailed account of the capacities for water-supply of the aqueduct of the Ourcq, or that of Arcueil,—a monumental work which no visitor to Paris should fail to see,—the Dhuis, the Vauve, the Seine, and the artesian wells of Grenelle and Passy, and their several reservoirs. It may be stated that, as in London, there are not wanting complaints on the part of the householders as regards the high water-rates,—consequent on some unfortunate arrangement made many years since between the city and the water company,—complaints which are only too well founded while the supply of water is so deficient, and while some 50,000 houses in Paris are still utterly unsupplied with this first necessity of public hygiene.

An ample water supply is an absolute need in a great city, and the task of getting rid of this supply, daily rendered foul by use, is another, and apparently even more difficult duty, one with which Paris has to some extent grappled, though it can scarcely be said to have solved. It can be understood that the management of something like 300,000 to 400,000 cubic yards of water is no small matter. Within a few years immense improvements have been effected. The Seine is no longer, within the walls at least, the receptacle of all the filth of the city: a network of drains has been laid that carries to a distance the liquid flood which, so chemically injurious to human life, contains such invaluable aids to vegetable culture; but, in spite of all the efforts so far made to realise to the full these advantages, the attempt may still be said to be only in an experimental stage. The Seine, disinfected in the portion that flows through Paris, receives most of the city sewage at Asnières, poisoning all the river for miles below.† Of the efforts made to utilise for agricultural purposes the sewage of the city, it may be said that they have, to a great extent, been crowned with success. The city of Paris took in hand the question, and at its own expense completely showed on the *Plaine de Gennevilliers* the agricultural value of the sewage manure for the raising of vegetables; but the difficulty thus to some extent solved, the increase of population has produced a larger quantity of sewage than can be utilised, and the question remains still to be settled. It can be understood that the proposal to flood a portion of the beautiful forest of St. Germain with the reeking manure, however valuable, has roused tempests of indignation. In the meantime the city continues to pour out daily its thousands of cubic yards of sewage. New drains are yearly laid,—it is not long since that almost every street in Paris seemed blocked with huge drains and piles of excavated earth. Paris, which possesses hard upon 500 miles of sewers, is still but very insufficiently supplied, and half as many miles of streets have still to be provided with sewers. As for the question of the branch pipes to each house, that much-disputed point remains as yet as unsettled as it seems in every country. Theory after theory is put forward, and progress is to some extent made, but

to every thoughtful mind the inconveniences and dangers of the present system must be apparent.

At this time, when we know so much of unhealthy dwellings, it may not be uninteresting to mention the powers of the Paris Municipal Council in the execution of the existing laws upon unhealthy dwellings. In the first place, the council nominates a special commission to visit the site reported, when if repairs or demolition be necessary, the landlord is required immediately to act. If the commission requires an outlay that appears exaggerated to the councillor of the parish, the question is reconsidered by another special commission, which may again refer the matter to the commission of unhealthy dwellings. The action of the council, it will be seen, is exercised as much in the interests of the landlord as of the lodger. The grounds for declaring any dwelling unhealthy are laid down as the following:—Air vitiated by emanations from ill-ventilated closets, the seats of which are not closed by an automatic cover, and the walls of which are not painted with zinc-white; insufficiency of light, either through smallness of the place or the limited size of the openings, dampness of ceilings and walls, as shown by stains, by the paper falling in shreds, or by mould on the woodwork; stagnant water caused by the bad paving of courtyards, by the want of properly sloped or cleaned gutters. It is the power of any one, through letter to the mayor of his parish, to complain of the unhealthy nature of any lodging occupied either at the time or previously. The parish doctors are also called upon to make known if the want of proper hygienic precautions may have caused in any way the death of any person they may visit. Attention is invariably paid to any complaint when well founded.

Paris, like every great modern city, finds the disposal of its yearly increasing dead a constant source of difficulty, and there already exists a proposal for the establishment of a necropolis at a considerable distance from the capital, but connected with it by a special railway,—a place resembling, in fact, our Working Necropolis, only at a much greater distance from the capital, but Parisian public opinion is against the idea. The Parisians like at times to visit the resting-place of their dead, and this distance,—hard on thirty miles,—it is urged, would interfere with a long-established custom. The fact remains none the less, that some steps will have shortly to be taken to set the question at rest. The subject of cremation is constantly violently agitated in council. In the meantime, the dead continue to fill silently the few still vacant spots reserved for them under the walls of the capital. A word, before leaving this subject, on the very different system from ours which prevails in Paris of burying the dead, and in which the municipality take no small share. The statement of the death once duly notified to the local *mairie* or town-hall, a certified doctor later in the day verifies the decease, after visiting the body. At the *mairie* where the death has been stated, a complete arrangement is made,—in a special department for the purpose,—for the funeral, which usually follows the day after the death. This arrangement is a simple matter of expense, there being a series of eight or ten classes, if we mistake not, in which the expense varies from 60*fr.* to a few shillings. The simple order once given to the (municipal) official of the "*pompes funèbres*," the necessary sum paid, the plot of land purchased for the grave (an equally simple matter, the purchase being for ten years, or for perpetuity), the sad business is completed. The following day the officials of the "*pompes funèbres*" arrive, the funeral service is duly performed, either by the *curé* or the Protestant clergyman, as the case may be, and with a propriety not always known in our country, the sad duties are performed to the dead, a little procession files through the streets, each person uncovering as the hearse passes by, and soon earth is given to earth, dust to dust. Only those English persons who may have borne the affliction of a loss away from home in the great city by the banks of the Seine can conceive the simplicity of the Paris undertaker's duties, and the singular absence of that clashing jar on the feelings which seems so invariably to accompany the performance of such duties in this country.

In another article we shall treat of the public thoroughfares, their sweeping, lighting, paving, &c.; the omnibus service, the charity organisation, education, and the budget of the Paris municipality.

\* See vol. xii., p. 746.

† Those who are desirous of further information may refer to an excellent paper on the subject which recently appeared in the *Cornhill Magazine*.

\* At the end of the seventeenth century it is calculated that the half million of inhabitants were supplied each with 3½ *litres* (considerably under a gallon) of water.

† The "*Grand égout collecteur*" is the largest work of the kind in existence, the *Cloaca Maxima* only being comparable with it. From its starting-point under the *Place de la Concorde* it runs three miles to Asnières, with a slope of about 1½ in. to every five furlongs (50 centimetres to the kilometre), a breadth of about 18 ft. 6 in., and a height of about 15 ft.







of the present century, it is not difficult to see abundant reasons why it should to a considerable extent have been greatly abandoned by the present generation. But these again are not valid reasons why monumental sculpture should not still be employed. In itself it is an art which should always fill, if we may say so, a practical place, and which may be at once artistic and suggestive. Again, what a field is open to it in the cemeteries, which now become commoner every day. Why should they not become not only our burying-places, but likewise spots beautified and dignified by art? Our climate is, unfortunately, not one in which marble stands well, and therefore there may be urged practical objections against sculpture in our open cemeteries; nevertheless there are some species of marble which are not so much affected by the weather and climate as others, and these might be well employed. Bronze is more or less unaffected by climate, and therefore there is no reason why this metal should not be employed by those who can afford to erect substantial and lasting monuments. But inside our churches, at any rate, marble is safe, and here, as we have already pointed out, bas-reliefs are available as most proper means of perpetuating the memory of those who are gone. If the present neglect of monumental sculpture should continue, it will be a matter of regret, not only for the sake of English art, but also because it deprives many of a kind of memorial which is singularly in harmony with ecclesiastical buildings, and fitted to be a dignified and lasting record of the dead.

#### ART CLUBS ABROAD.

THE recent visit of H.R.H. the Prince of Wales to the home of the Savage Club has revealed to the world at large the existence of an artistic association which, though it has now been formed a quarter of a century, may be said to have been little known outside a certain circle, large it is true, but still comparatively limited. The fact is characteristic in a measure of our country, where it must be remembered the somewhat professed Bohemianism of the "Savages,"—Richard Savage, though of noble origin, was a thorough specimen of the tribe,—has never held the position accorded to it abroad. There have existed, of course, from all time, such convivial gatherings of professional brethren. In the history of Italian art the *casualte* of the Early Renaissance are not unknown,—those friendly meetings to which the artists, such famous men as Donatello and Ghiberti, used to bring each, on a certified day, his own special and self-made dainty subject for the approval of his brethren.

Our Savage Club has not unfttingly been said to resemble in some sort the well-known Paris *Cercle de l'Union artistique*, better known as the *Mirlitons*. Nicknames seem to attach to popular clubs; the club in the Rue Volney is familiar to Parisians under the free-and-easy title of the *Ordremerie*; but the aims of both these associations are, it must be admitted, somewhat higher than those of the "Savage." In their handsome Louis Quatorze apartments in the aristocratic Place Vendôme, the *Mirlitons* yearly organise, a few weeks previous to the opening of the *Salon*, a select exhibition of the pictures intended for the Palais de l'Industrie, and the club in the Rue Volney has long rivalled its more exclusive neighbour in exhibitions of this kind. At the present moment both these exhibitions are open, and in the Paris season they hold high their position among the attractions of the spring months. But it is not alone exhibitions that are held by the *Mirlitons*; for few of the fashionable gatherings of the season are invitations more eagerly solicited than for the *Mirlitons* when some well-arranged concert or clever comedy is performed on the boards of their well-adapted theatre. Bohemian in no way are the *Mirlitons*, though with not a few of the best elements of the good-fellowship of Bohemianism. In addition to the exhibition, concerts, and comedies, a certain sum is yearly voted for the publication of literary and musical works and the purchase of pictures, and their reproduction by engraving or lithography. The aims of the *Cercle de l'Union artistique*, as it is officially termed, are it will be seen, marked and decidedly of a high order; those of the rival *Ordremerie*, the *Cercle artistique et littéraire*, being scarcely less ambitious or praiseworthy. Were it not that our Burlington Club has organised within past years such an interesting series of exhibitions, it might, indeed, be brought against our city of clubs as a reproach that we possessed

no association to be compared with the *Mirlitons* or the *Ordremerie*, to which recently a fresh rival has risen in the *Cercle des Arts libéraux* in the Rue Vivienne, where at present is being held a charming exhibition of works by lady artists. In Paris there are not wanting clubs very much like the "Savage"; but we are afraid our Prince could scarcely, even in the strictest *incog.*, visit the homes of revelry and enjoyment that hang about the artistic heights of Clichy and the Quartier Latin.

Oddly enough, artistic club life has not seemed to flourish well in Rome. It is true that for many years there has existed a German Artists' Club, the friendly character of which is worthy the closest imitation. Many must be the agreeable recollections connected with this club with visitors to Rome, from crowned heads downwards, but English artistic club life has not flourished in the city of the popes. In what artists are apt to call the old days of Rome, in the days even as late as the liberal pope Pío Nono, the Papal Government did not encourage social gatherings of a club kind, and the eminent resident English artists, Gibson and others, were very unwilling to do anything to disturb their friendly communications with the Government, so that whenever an English Artists' Club was suggested, the plan generally fell through, though there are not a few English artists, and at the head of whom is the present P.R.A., who must remember with pleasure, not unmixed with the recollection of some anxiety, how the English Artists' Club struggled through its early years of existence. We rather fancy that the somewhat mercurial character of artistic life in Rome rendered the club a little indisposed to encourage artistic membership; or, perhaps, the members allowed themselves too easily to be overshadowed by the great names of Michelangelo and Raffaele to admit of a wider sympathy with the smaller men.

Every stranger who has visited Düsseldorf knows the *Malkasten*; it would not require the presence of jovial "Fritz," the Crown Prince, for the Savage Club of Düsseldorf to become known to travelled Germans. Faithful to their motto,—

"Eret mach dein' s'ach,  
Dann trink und lach,"—

and under the aegis of their arms, the double-headed eagle grasping in its talons in lieu of the orb and sceptre, a latch-key and a beer-mug, as typical of late hours and good fellowship, the members of the *Malkasten* pass happily their evenings in the historic gardens they occupy, once the home of the philosopher Jacobi, who has often entertained here Goethe, Herder, the Princess Galitzin, and many others of that famous band to whom German literature owes its reputation. The club, if we mistake not, is hard on forty years old; from the first it bore the characteristic name of the *Malkasten*, or paint-box, containing every possible variety of colour and shade represented in its members, as from the diversity of his box the painter is able to produce his one harmonious whole. Founded on the principles of genuine German good-fellowship, the *Malkasten* has prospered to this hour. Jovial are its ordinary gatherings in the summer in the old gardens round which lingers, as it were, the spirit of the good old times; and in the winter, in their new clubhouse, superb indeed are the fêtes that are given from time to time in the richly-decorated rooms, where all the resources of the friendly society of Düsseldorf artists are brought into play as is only proper in a club whose protecting patron is Albert Dürer. Brilliant, indeed, is a *garden feste* in the pleasant summer evenings by the Rhine, and thoroughly at home does the English visitor feel himself amidst the cordial welcome of half-countrymen of his. The *Malkasten* of Düsseldorf is, of course, an exceptional club; but throughout Germany, in all the art-centres, in Manich, in Weimar, in Berlin, in Vienna, there are clubs of a similar nature, where good fellowship is ever the order of the day. Indeed, there breathes in the *Künstler-verein* of the Fatherland a friendly spirit of artistic companionship that it is to be regretted is sadly absent in our country. Our few art-clubs (let us not forget as belonging to the same order the *Lotos* in New York), though England is the land of clubs (the very word has been imported into most of the foreign languages), cannot be said to be the genuinely social and professional gathering-places such as exist abroad, where the very word "artist" is understood in a wide sense scarcely familiar in our country, and where the sculptor, the architect and the

painter, the musician, the poet, the literary man,—every one who does his work truly, honestly, and with an ideal, is ranked justly as an artist. Let us hope that the recognition by our popular Prince of the Savage Club may tend to spread wider abroad the spirit of brotherly good fellowship which constitutes the chief characteristic of the club in the Savoy.

#### THE CANAL INTEREST AND THE BOARD OF TRADE.

AN influential deputation, representing the canal proprietors of Great Britain, had an interview with the Chairman of the Board of Trade on the 15th current, in order to request the opposition of the Government to the Bill now promoted by the Midland Railway Company and other parties for the purchase or conversion of canals.

Out of 4,350 miles of canal in this country, some 1,700 are already in the hands either of railway companies or of their covert agents. The result is that the canal transport, to which England owed so much of her prosperity fifty years ago, is in many places virtually closed, and the traffic is forced upon the railways. But it has been distinctly proved that for all objects of such low value that it is not worth while to pay an extravagant price for speed, carriage by canal may be effected at from one-third to one-fourth the price possible by rail. On the Continent this is not only known, but acted upon, and the information which the canal-owners are now collecting on the subject in England is of a very serious character. Some of the principal trades of England are being transferred to Glasgow or to Paisley, owing to the superior cheapness in transport, both of raw material and of finished goods, afforded by the Clyde. Pig iron has long shown this influence. Heavy iron castings from Shropshire, and steel rails from Sheffield followed. Now the shoe trade is leaving Stafford and Northampton for the Valley of the Clyde; and finally, the cotton-thread trade is leaving Lancashire for Paisley. "Scotland," a correspondent writes, "is beating England hollow by reason that the rails there are held in check as to their charges by the waterways. Thus, food and raw materials come more cheaply, and goods are sent away with corresponding advantage." The question of the utility of the canals in keeping the railways in check is thus becoming fully appreciated by the freighters. What is most essential now is for the railway proprietors to be made to understand that by grasping the traffic for which speed is of no object, they are injuring their own resources as well as the manufacturing industry.

Mr. Chamberlain said that the Regent's Canal Bill was in contravention of the Canals Act, which prohibited the transference of a public water-course to the control of a railway company. In spite of this, however, Parliament had permitted such transfer, on the condition that the navigation should be maintained, an appeal lying, in case of infraction of this condition, to the Railway Commissioners. But no such right of appeal has prevented the locks on the Wey and Arun navigation from being pulled down, the bricks from being sold as old materials, and the bed of the canal from being turned into meadow land. Nor is the navigation of one or two of the old main lines of lucrative water traffic, now owned by the railways, in a much better condition. As the object of the Regent's Canal Bill is to fill up the waterway and convert it into a roadway, it would better befit the Board of Trade to oppose the Bill at once, than to trust to its purport being defeated by subsequent law proceedings, after Parliamentary sanction had been obtained to something (which would depend on the wording of the clauses of the Bill) which might defeat the proviso referred to altogether.

In the case of the Thames and Severn Canal Bill, the power to destroy a link in the water connexion between these two great inland waterways was avowedly sought, although only by cutting a few yards of canal. As to this, the Board of Trade will oppose. The reply to the deputation hardly gives the impression that the vital importance of the subject was appreciated by the Board of Trade; but there is certainly a greater public disposition now manifested to look the subject fairly in the face than has been observable since 1834, or thereabouts.

We understand that some of the gentlemen interested in this matter have called in an engineer, long familiar with the subject, to



report on the relative cost of canal and railway carriage. Such a report, if adequately drawn up, must have not only a national but a European interest. We trust that we may have an early opportunity of presenting its main features to our readers, as from the hands to which it is entrusted we think it pretty sure that it will fully and impartially enter into all the elements of the comparison.

#### UNIFORMITY IN BUILDING AND SANITARY REGULATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of this Institute on Monday evening last, Mr. Ewan Christian, vice-president, in the chair, the discussion on Mr. Boulton's paper\* was resumed.

Mr. E. O. Robins pointed out that the subject was not then being discussed for the first time in that room. On the contrary, it had been on several occasions under discussion, and more particularly in connexion with the Architectural Conferences of 1876 and 1878.† In the last-named year Mr. Douglass Mathews read a paper before the Conference on "The Model By-Laws as the Basis of a General Building Act,"‡ and Mr. Boulton also contributed a paper§ on the subject to the proceedings of the same Conference, at which, also, some notes on the subject by Mr. Honeyman, of Glasgow, were read.¶ At the previous Conference, i.e., the one held in 1876, Mr. Clarke and Mr. Honeyman also read papers on the subject, and these and the other papers named were very fully discussed. These discussions were, in part at least, due to the fact that the Local Government Board had had under consideration a code of building by-laws applicable to the whole country, and which were intended to serve the purpose, tentatively, at least, of a Building Act applicable to the whole country. During the four years which had elapsed since 1878 the subject had received further attention, and had been more closely approached, and it was to be hoped that it would be further discussed and considered at the next Conference. The Institute had already taken steps in the matter, in pursuance of a resolution passed at the Conference of 1876. Mr. Boulton's paper, therefore, was but a return to the discussion of an important question which had already been very fully discussed, and was perhaps, a preparatory step to its rediscussion at the next Conference. Mr. Boulton in his paper had drawn attention to what he called four axiomatic principles, and had suggested that any General Building Act which might be passed ought not to be confined to mere matters of construction and materials, but should also be a sanitary Act. Mr. Honeyman, on the contrary, had strongly advocated that the two subjects should not be dealt with in one Act. Whether they were dealt with in two Acts, or whether they were dealt with in two Acts, it was of the first importance that the clauses of any Act or Acts should be drawn up on broad principles, defining hard-and-fast lines in as few directions as possible, in order not to hinder improvement and justifiable variation in the details of construction, and so as not, at the same time, to unduly interfere with the freedom of action of the local authorities where freedom of action might safely be left to them. Under the head of "Laying out Land for Building," Mr. Boulton spoke of density of population, which must be taken into account, whether calculated by area or by cubic space; but whether one or the other, there was no doubt that close packing of the people was an injurious thing. Dr. Farr had shown that the nearer people lived together the shorter were their lives. Dr. Playfair had shown that, whereas, before the Fire of London, the death-rate in the City was 80 in the thousand per annum, after the City was rebuilt the rate of mortality was only 40 per thousand; while at the present time the death-rate of London was only a little above 20 in the thousand. He thought it was not wise to ignore a broad general principle of that kind, even though certain instances might be quoted which seemed to disprove its soundness. As to unbuilt areas at the backs of houses, it surely could not be advantageous to have no back areas to houses? No widening of streets in front would ever compensate for the want of light and air at the backs of houses, unless the houses were only one room deep and built back-

to-back. Perhaps a back street 20 ft. wide or so might in some cases be advantageously substituted for the back areas. To pass to another point, Mr. Boulton had said in his paper,—and it was a strange thing for an architect to say,—that it was useless to provide means of ventilation for people not intellectual enough to use them. Such a recommendation seemed to augur but ill for the future. Were architects, then, to work down to the level of their constituents? Should they not rather seek to work so as to educate their constituents? "Count not thy brother a reprobate," said the proverbial philosopher. Architects ought certainly to look forward to uplifting the tastes and sanitary knowledge of the people for whom they built. As regards damp-courses, Mr. Christian at the last meeting made some very practical remarks as to the way in which they might be dealt with under certain circumstances. Mr. Boulton had made some sweeping assertions under that head. He said, "In the absence of any really scientific investigation into the effects of damp-courses in walls, of laying concrete all over a building site, and of covering drain-pipes with concrete, it was not possible to show their sanitary necessity; and such nostrums of superstitious empirics should not be enforced on those more familiar with structural requirements." Now, on the part of builders, very probably there was an absence of scientific investigation. Architects had, however, paid some attention to the subject, but they were modestly content to acknowledge that it was to the researches of the medical, chemical, and physical professors that they were chiefly indebted for their knowledge on the subject. As a member of the committee of the City and Guilds of London Institute for the Advancement of Technical Education he had lately had an opportunity of inspecting the laboratories of Switzerland, Austria, and Germany. While in Munich he visited Dr. Pettenkofer's museum, called the Hygienic Institute. He afterwards spent two hours with Dr. Pettenkofer's chief assistant, and examined the results of experiments on building materials and sites, and the processes by which those results were arrived at. Among other points demonstrated by the experiments to which he was referring was the fact that the air in the ground beneath a cellar or basement of a house was under a higher pressure than the air in the cellar itself, involving also the fact that the ground air was always in motion. These results conclusively showed the necessity of the precautions as to covering the site with concrete, for where the soil was polluted the air entering the house from the ground in the basement would also be polluted. Other interesting experiments as to the porosity and permeability of materials were also witnessed by him, all of them fraught with valuable lessons to the sanitary constructor.

Mr. J. Douglass Mathews observed that, as Mr. Robins had truly said, the matter under discussion was not a new one to the Institute. The matter of the Model By-laws and the proposed General Building Act had been very fully considered on two separate occasions, viz., at the Conferences of 1876 and 1878. Mr. Boulton's paper had brought forward many of the arguments used on those occasions both *pro* and *con*, as well as embodying new points quite worthy of discussion at the present time. He fully agreed with Mr. Boulton that many of the requirements of the By-laws, though reasonable enough in themselves, would be somewhat arbitrary if transferred to and made part of a General Building Act; but it should be remembered that the By-laws had been drawn up with the idea of keeping in check the more unprincipled of the speculating builders, rather than having for their primary object the assisting and promoting of all good and proper building. It seemed to him that the result was very unsatisfactory, for although some speculating builders required to be held with a very tight rein, those who desired to build in a proper manner had unnecessary restrictions put upon them by the By-laws. Mr. Gordon Smith, in his remarks at the previous meeting, said it was the architect's business to get over difficulties. True, but when Acts of Parliament were under discussion, to talk about getting over difficulties in them sounded rather like an intendment to evasion of the provisions of Acts of Parliament,—ways of getting over difficulties which should certainly not be attempted by architects. It was quite possible to make Acts of Parliament relating to building so clear and distinct, and at the same time so

reasonable in their requirements, that there should be no difficulty in having them properly carried out. The Model By-laws were very fully discussed not only at the Conferences, but by a committee of the Council of the Institute, in response to the invitation of the Local Government Board. That committee held fourteen meetings, and every clause of the By-laws was very carefully considered, and many suggestions for their improvement were made to the Local Government Board. Many of these suggestions were adopted, either in whole or in part, but there were others of equal importance which had been completely ignored. The Local Government Board, perhaps, hardly gave that deference to the suggestions which they deserved, considering that they emanated from the Institute. Those who were in the habit of working under and enforcing the Building Acts were perhaps better able to appreciate difficulties and defects in the Acts than the Local Government Board. It was one thing to put building regulations on paper; it was quite another thing to carry them out in their entirety. Mr. Boulton's paper raised a great many points of great interest. If the Model By-laws were to be taken as the basis of a General Building Act, every point deserved careful consideration. He agreed with Mr. Boulton that the By-laws entered too much into detail to serve as an Act of Parliament, and that an Act of Parliament should deal with building matters in a general way, leaving it to local authorities to make by-laws under the Act, such by-laws varying in different localities, according to soil, climate, and materials. Mr. Boulton had advocated that the business of the builder should be as open and as free from restrictions as that of the hatter and the shoemaker; but he (Mr. Mathews) could not agree in that view. No doubt, greater freedom from restriction would enable builders to erect cheaper houses than at present, but was cheapness of first cost the only consideration, and were badly-built and unhealthy houses really cheap at any price, however small? He thought not. A person who bought a hat for a small price only injured his own interests if the article proved to be bad, but a builder desiring to manufacture houses cheaply could not possibly live in and use all the buildings he ran up, and even if he could it was questionable whether, in the public interest, he should be allowed to perpetrate bad building, and then to suffer the consequences in the shape of disease. Houses were built for other people to live in, and it was to the interest of the speculating builder of the worst sort to build them as poorly as possible, and to get as much for them as he could. Surely such a method of planting colonies of disease and squalor, and consequently of pauperism and crime, should not be allowed to go on without restriction? On the contrary, he held that it was one of the most important duties of the State to provide securities for healthy dwellings for the people. The public had also other rights capable of being secured by a Building Act; for instance, they had a right to expect that buildings should be erected in such a way as that accidents should not be likely to happen. With regard to areas at the backs and sides of houses, the By-laws not only required areas of a certain extent, but of a certain minimum width,—a stipulation which very often rendered building in a town a very serious matter. Again, there was no reason why such areas should be continued to the ground if the ground-story was lighted by a skylight and not used as a dwelling. In reference to what Mr. Robins had said as to damp-courses, it was often of very great consequence not only to provide horizontal damp-courses, but, as the Chairman had suggested, vertical ones, because, while the By-laws proposed by the Local Government Board rightly insisted that a house should not be built upon a site the surface of which was covered with fecal or vegetable matter, there was nothing to prevent such horrible stuff from being used to fill in the trenches outside and in contact with the main walls of the house. In view of such facts as those to which Mr. Robins had alluded, the danger of such a proceeding was very great. Reference had been made in their paper to the subject of concreting over the areas of a house, Mr. Boulton saying that it was not required in all circumstances. One of the recommendations of the Institute to the Local Government Board was, that there should be a layer of concrete 4 in. thick well rammed all over the site of every dwelling-house, except when the foundation was of rock, clean gravel,

\* See *Builder*, p. 158, ante.

† Fully reported in the *Builder* volumes for these years.

‡ *Builder*, vol. xxxi., pp. 593 et seq.

§ *Ibid.*, p. 610.

¶ *Ibid.*, p. 611.

\* *Builder*, vol. xxix., pp. 594, 604.



or dry sand. A great deal of care was taken in the Model By-laws with regard to sanitary matters, but their requirements in regard to such matters could not and ought not to be strictly insisted on. Although it was only a few years ago since the By-laws were issued, sanitary science had made advances, and more was known now of the true principles of sanitation than when the By-laws were first issued. Was it necessary, was it desirable, that an Act of Parliament should contain the minutest of sanitary details? He was very glad at the reference made by Mr. Boulton to the means to be taken to secure the proper laying of drains, and he thought that the Local Government Board or the local authorities might be responsible for the appointment of competent persons to see to the proper laying of drains and issue licences to such persons, who alone should be employed by local authorities to supervise the laying of drains. In his paper on the subject read before the Conference in 1878, he urged the same view. No mention was made in the By-laws as to the strength of timber or iron to be used in building. In the Liverpool Building Act, he believed, certain scantlings of timber were prescribed for certain uses, as well as certain strengths of iron. It would be interesting to know how those provisions of the Act had been found to work. It appeared to him that it would be very difficult to frame tables of scantlings of timber or strengths of iron that would be of any very great use in the constantly varying circumstances of practice. And upon what principle should such scantlings and strengths be fixed? The minimum scantlings and dimensions that would be sufficient where good materials were used would be insufficient where bad materials were employed, and the fixing of an unnecessarily high minimum of scantlings and dimensions would be unjust to those who employed good materials. Mr. Boulton thought that the provisions of the Local Government By-laws as to walls were complicated. He could not agree with him, although the walls were unnecessarily required by the By-laws to be thicker than under the Metropolitan Building Act. Even with the bad bricks and bad mortar so largely used in the metropolis, accidents to walls were of comparatively rare occurrence, proving, as he thought, that the dimensions of the walls were ample for stability. Under the By-laws, cross-walls were to be carried up to the top of the topmost story of a building. Now the topmost story under the By-laws was a rather extraordinary story, for the space in the roof between the tie-beams and the collars was defined as a story, thus making an ordinary two-story building into a three-story one. The Institute Committee before mentioned had suggested that the top story of a building should be defined as the upper story in a building when it was constructed so as to contain a living or sleeping room or rooms. But this was one of the suggestions which had been passed over. Many local codes of building by-laws were unreasonable in their requirements as to the deposit of complete sets of plans, sections, and even elevations. Such exactions upon the building-owner were unreasonable, and, where an architect was employed, wholly unnecessary. As to the administration of a General Building Act (if such were ever obtained), he thought that in large towns the building surveyors should be practising architects, as men of the best abilities, and who were rendered independent by their practice, could always be found in large towns. In small towns it was, no doubt, necessary to have salaried officers. But the men appointed to supervise buildings under a Building Act or Building By-laws, whether paid by fees or by salary, should in all cases be duly certified building surveyors, who had passed a proper examination. Probably the body who should be entrusted with the conduct of those examinations and the granting of certificates of competency was the Institute itself. While he wished to see localities retain the management of their local affairs in their own hands, because he thought centralisation should not be carried too far, yet, at the same time, the central authority should be left a certain power of control. Mr. Boulton's suggested court or board of appeal, if carried out, would be most valuable as a means of bringing recalcitrant authorities to book. One defect of the Model By-laws, considered as the basis of a General Building Act, was that they made no provisions as to public buildings. The By-laws, prepared in accordance with a section of the Public Health Act, contained no provisions against danger from fire and other matters that

should come within the scope of a Building Act. If a General Building Act were really desired, it would be well to discuss the matter in detail at the next Conference. In the meanwhile, if the Institute could put itself into communication with the public bodies and with building surveyors,—with all, in fact, interested in carrying out such an Act,—great advantages might result. He did not think that any other body was so well qualified to take the initiative as the Royal Institute of British Architects.

Mr. Robert Rawlinson, C.B., said he had not read the whole of Mr. Boulton's paper, neither did he come prepared to speak on the subject, which was one to which he had paid some attention. He felt bound to say that he agreed with the observation that had been made that any Building Act which was to be a general Act must give a very wide range of latitude as to materials and details of construction if it were to meet with acceptance. He also agreed in thinking that it was not wise to aim too much at centralisation. But it should be recollected that a General Building Act, intended to be applicable to all places, must be framed and carried out by means of what was termed centralisation. It should be remembered that the Model By-laws, about which so much had been said, were issued by the Local Government Board merely as suggestions. Speaking of his own department, every document that had been issued under his own hand had been termed by him "suggestions" for such and such a thing, because he knew how difficult and how impossible it would be for him, whatever his knowledge might be, to dictate to those who were carrying out works under conditions the whole of which could not possibly be before him. A perfect Building Act could not be made, but one that would be most acceptable would be one drawn up in the spirit, *i.e.*, one giving general instructions upon which by-laws should be framed to suit particular localities. In such an Act structural details should be gone into as little as possible. In framing by-laws under such an Act for special departments of work, the same care should be taken as was taken by the Local Government Board before confirming By-laws as to water and sanitary fittings, to prevent undue preference in specifying appliances. Very frequently a country surveyor, instead of specifying in the By-laws sent up to be confirmed a particular type of water-closet, service-box, or valve, specified one particular variation of each type of appliance. Such a course was manifestly unjust and impolitic, because it was playing into the hands of the maker of one special variety of article, there being, perhaps, a dozen varieties of the same type quite as good and as cheap as the one singled out. As to the sites of houses, he did not know how any general law was to be framed. He constantly found houses built on sites which it was impossible to sewer and drain properly; but if all building on such sites were to be prohibited, the effect would be to stop the growth of many towns,—perhaps most properly. Take the case of London itself: how many scores of acres of buildings which were built on sites which must inevitably be condemned if such a rule were to be laid down? All that portion of the East of London known as the Isle of Dogs was below the high-water level of the river; so was all West Ham and a great portion of Brompton. Local By-laws had to be carried out by Local Boards. What were Local Boards, and how were they constituted? Who were the persons who got themselves elected upon them, and were we quite sure that all those gentlemen who gave so much time to the management of local affairs did their work free, gratis, and for nothing? Had they no interests, direct or indirect, to serve? Had they nothing to do with buildings erecting or about to be erected? It would be found that a great portion of them were interested in building, or were owners of cottage property already erected. The first Public Health Act provided that the Local Board might appoint their own surveyor, but that he should not be dismissed by them without the consent of the central body. That provision was of course intended as a protection to the surveyor, so that he might do his duty fearlessly. But there was such an outcry against the "domineering" power of the central Board, that when the Public Health Act was renewed, that clause was rejected, and Local Boards could now discharge their surveyors without any hindrance. The whole of the country was divided into urban and rural districts, and the rural districts were em-

powered to carry out works of sewerage and water supply just as the urban districts were empowered. The rural and urban authorities sent up plans to the Local Government Board which very frequently gave no idea whatever of the nature of the works intended, and which in point of drawing would disgrace a fifth-form boy at school. Such plans were submitted in order to obtain the sanction of the Board for raising the funds to carry out the works. The Board was not an executive body, and had no establishment and no means of making proper plans for the execution of the works required. The Board had issued some broad general instructions on the matters of water supply and sewerage, but they were only issued as suggestions, and were intended for the perusal of educated surveyors. Yet the Board was accused of raising barriers to sanitary progress because it did not, and could not, give its approval to improperly drawn-up plans. He was constantly being met with the statement that there ought to be more absolute power to do certain things, as, for instance, to take possession of other people's property when it was required for public purposes. Was it to be expected that any Government would give such arbitrary power to any and every local authority? He did not know anything worse than action under the Lands Clauses Consolidation Act—did not know of any process quite so costly, so wearisome, and so cumbersome. Under that Act it was quite possible to spend about 5,000*l.* in litigation over a sum of not more than 500*l.* Many times when he had been summoned to serve on arbitrations it had made his heart ache to see, on the first day of the proceedings, a room filled with barristers, lawyers, and engineers arrayed on either side, one set prepared to swear one thing and the other set prepared to swear quite another thing,—the first day's costs being greater than the sum in dispute. It was quite time that such a state of things was remedied. He might be accused by some people of wishing to spoil "business." No doubt, few things were so profitable, either to lawyers, architects, or engineers, as to be summoned to attend a good "ratting" arbitration, but he thought that most right-minded people who had witnessed such proceedings as those to which he was referring would condemn such a roundabout and costly way of settling such disputes. With regard to areas in the rear of buildings, it would be a good thing if in any General Building Act provision were made that existing areas should not be abused. He knew towns which were absolutely shocking in that respect. They had been built and re-built. No town was more mismanaged with regard to its buildings than Liverpool some twenty-five years ago or more, when "jerry" builders were allowed to run up batches of courts which gave it an unenviable notoriety. He had himself bought some of that property, and endeavoured to do his duty by it; but one-third of the rent went regularly in repairs and maintenance. He had heard it said, "Don't interfere with the thickness of the walls!" That depended upon the bricks and mortar used. The joists used in many buildings were miserably deficient. Surely some law was wanted to reach that sort of thing! At any rate, when laws were made, let them be properly administered. The most perfect Acts of Parliament and by-laws would be of no avail if not carried out; and their being properly carried out depended largely on the integrity and earnestness of the local authorities. This discussion would, he hoped, do good in drawing attention to the great importance of the subject.

Mr. Goldstraw, Building Surveyor to the City of Liverpool, said he had been a little disappointed at not hearing more said on the question of uniformity in building legislation. It seemed to be taken for granted that some sort of General Building Act would sooner or later be imposed on the country, but speakers did not appear to be quite clear in expressing their views whether a General Act was advisable or necessary. Did the architectural profession generally wish for such an Act? In his opinion such an Act would be a very great boon to the country. In Liverpool they had a Building Act which had been in existence for forty years. That Act differed materially from the Metropolitan Building Act, and architects practising in the metropolis who had to erect buildings in Liverpool frequently made very serious and costly mistakes in consequence of the dissimilarity of the two Acts. That sort of



confusion prevailed, more or less, throughout the country, for there were very few places which could be said to agree at all in their building regulations. He was sorry to have to say it, but it was his opinion that architects were too apathetic on the question. The multiplicity of varying building regulations all over the country must involve great loss of power, and a great deal of confusion. In his opinion, the architectural profession ought to be grateful, to say the least of it, to the Local Government Board for taking the trouble to frame the Model By-laws, and for seeking to get them adopted, so as to bring about some approach to uniformity of practice, which must be the basis of any General Building Act. But the Model By-laws, taken as the basis of a proposed General Building Act, were deficient in what he thought to be some essential provisions. Under the Liverpool Building Act the scantlings of timber for floors and roofs were very clearly specified. The omission of such particulars in the Model By-laws was, in his opinion, a serious defect. He agreed very fully with Mr. Boulton in saying that the provisions of any Building Act intended for use throughout the country should be very general, but he did not agree with him when he said that the ingredients of mortar ought not to be specified in such an Act. The Liverpool Act required that mortar should be composed of not less than 1 part of lime to 3 parts of clean sharp sand. If that requirement was not met, the builders were summoned. Unless the ingredients of mortar were defined by the proposed General Building Act, it would be impossible to get the magistrates to convict the users of bad mortar; for the question would be raised, What is mortar? Therefore, any vague mention of mortar in the Act would not prevent the use of bad mortar. With regard to the appointment of officials to see that the proposed Act was properly carried out, Mr. Boulton was in favour of the system which had long prevailed in the metropolis, which was, he thought, justified by results. He referred, of course, to the system of appointing district surveyors. Now he (Mr. Goldstraw) was of opinion that such a system, if introduced into Liverpool, would be most pernicious and unworkable, and Mr. Aldridge, President of the Liverpool Architectural Society, was of the same opinion. He thought that the same objections that applied to pluralists in the Church and to polygamy in social life applied with more or less force to the system of district surveyorships in vogue in London. That system, which prevailed before the Metropolitan Board of Works and the Metropolitan Building Act of 1855 were called into being, had been perpetuated apparently for convenience sake.

Dr. Thorne-Thorne, of the Medical Department of the Local Government Board, said that he had always prided himself on belonging to a profession the members of which had, he thought, in common with architects and engineers, done something for the promotion of the public health. Mr. Boulton's conclusion that "the present deplorable state of sanitary science" was due to the medical profession, was, however, a rude awakening. He would say, however, that he had no hand in the preparation of the Model By-laws,—did not see them, in fact, until they were issued. A great deal had been said about concentering the sites of buildings, Mr. Boulton being of opinion that such a requirement was a very arbitrary one. Mr. Robinson's remarks had, however, shown the great importance of such a provision. One speaker had said that such a provision was not necessary in cases where the soil was a dry gravel or sand, but in his (the speaker's) opinion it was very essential that the site of a house should be concentered where the soil was of a porous nature. He had constantly found that outbreaks of fever had occurred in houses which were admirably built and apparently well attended to in the matter of sanitary requirements. What was the cause of such outbreaks? Simply that the leakage of a drain belonging to some adjoining premises had found its way into the beautiful bed of gravel which formed the site of the house, and, thus, not being concentered over its surface, had, when the house was warm and shut up close at night, given off deadly exhalations to be breathed by the inmates. It was, he thought, incontestable that phthisis and typhoid fever could be largely prevented by the concentering of basements. He was sorry to hear Mr. Boulton speak in condemnation of open areas in the rear or at the sides of houses. They might not always be properly kept, but, notwithstanding, their advantages

were great. He was greatly surprised at Mr. Boulton's suggestion that means of ventilation should not be provided for people not intelligent enough to appreciate their advantages. Surely it was not desirable for architects to conform to ignorant prejudices? It was rather their duty to seek to educate the people into an appreciation of sanitary necessities. One of the most encouraging results of the issuing of the Model By-laws by the Local Government Board consisted in the educational effect which they exercised on all local authorities who were desirous of doing their duty in protecting the public health.

Mr. E. B. Ellice-Clark, Borough Engineer of Hove, said he regretted to hear Mr. Boulton say that in a General Building Act it would not be necessary to give any definition of mortar. It was his (the speaker's) duty, on a recent occasion, to prosecute two builders for using what they called mortar, but which was certainly not deserving of that name, seeing that it was made up of about ten parts of loam to one of lime. Unfortunately, the Building By-laws of the town gave no definition of mortar, and among those who gave evidence in favour of the builders were two members of the local body of Commissioners, who, in opposition to the evidence of their own officer, said that the "mortar" in question was very good, and fit to be used in putting up rubble walling. That case was illustrative of the difficulties under which borough surveyors often had to work, and he was therefore of opinion that unless mortar was defined in any proposed General Building Act, it would be impossible to get a conviction. It was a mistake to suppose that building by-laws defining the quality of materials were made to control architects. The fact was that 95 per cent. of the buildings which had come under his notice as a borough official were erected without any supervision by architects, who, as a rule, built far beyond the requirements of local by-laws. In West Brighton, where a great many large buildings were being erected on land which cost £8,000, an acre, he had found no difficulty in carrying out the provisions of the Model By-laws. He was glad to be able to say this, because when the By-laws were under consideration at one of the Conferences referred to, he had spoken disparagingly of them. Further consideration and experience had, however, led him to change his estimate of their value. As to the deposit of plans with borough and local surveyors, he thought that architects made a little too much of the matter. Speaking for his own class, the borough engineers, he would say that they were, as a rule, men of intelligence and professional ability, and not men of a class who could justly be accused of appropriating or wanting to appropriate the ideas of architects. If they wanted architectural details, they could get them in abundance for a very small sum from the illustrations given in the professional journals. It should be remembered that it was impossible for a borough surveyor to control the actions of speculative builders. Any General Building Act should deserve its title, and should be administered by means of by-laws suited to the necessities of different localities. It would be impossible to frame by-laws too stringent to cope with the malpractices of the jerry builders, but by-laws suited to London necessities would not do for Liverpool, neither did they want on the chalk cliffs of Ramsgate all the provisions needed in the Valley of the Derwent. It would be a great mistake to insist too strongly on details in an Act of Parliament. If ever a General Building Act were passed, he trusted that Mr. Rawlinson would urge upon the Local Government Board the necessity of including in the measure some means of protection for surveyors who had to see to the administration of the Act,—protection in the form of some sort of appeal against the infliction of hardship upon them because they sought to faithfully carry out their duties.

Mr. John Hebb, Assistant Architect, Metropolitan Board of Works, said he should have thought that Mr. Boulton would have advocated some increased stringency in the law rather than have voted for its relaxation. It was, he thought, rather too late in the day to deny the necessity of having walls built of bricks of a certain description, and with mortar of a certain quality. He had also thought that the time had gone by for denying the advantage and necessity of covering the sites of buildings with concrete, or for questioning the efficacy of a damp-course.

With regard to the Model By-laws, as had been very well shown, they were put forward by the Local Government Board merely in the nature of suggestions, and did not become operative until they were adopted by the local authorities, who might vary them or adopt them in their entirety, as they pleased. The provisions of the By-laws appeared to be minute, but that appearance was only caused by a desire to meet all cases and all circumstances. He had hoped to have heard something said about the Metropolitan Building Act, which, although it had done good service, was not considered by everybody to be quite perfect. He should have been glad to have heard from the meeting any suggestions for the amendment of the Act. He thought that the suggestion that there should be one uniform law for building regulation all over the kingdom was Quixotic. Difficulties would arise which would be insuperable, the differences in nomenclature of building materials alone being very great, even if what was called a story-post in London was not called a bressumer in the country. How could such uniform legislation be brought about? It was hardly to be expected that the Metropolitan Board of Works could take the initiative in the matter. Successive Governments, whatever their politics, had shown very little anxiety to deal with the subject. The last proposal to properly codify the existing building law as far as it related to the metropolis was proposed by the Metropolitan Board of Works in 1875, but the attempt resulted in failure, its most serious opponents being the district surveyors and the Institute itself. The measure then proposed was a very patient piece of work, and had been mainly drawn up by the late Mr. Newall, who had been engaged in the preparation of previous Building Acts. The changes proposed by that Bill were not very serious, but were aimed chiefly at consolidating the law. This year the Board was promoting a very timid Bill dealing with some of the points which the Board had been told more particularly required attention, such as the limitation of the cubical contents of warehouses, &c. In fact, the Board, finding it impossible to improve the Building Act at one coup, were attempting its improvement by instalments, of which those which they succeeded in effecting in 1878, giving them power to make by-laws as to sites and foundations, had, he thought, given pretty general satisfaction.

Mr. Henry Dawson thought it would be a mistake to assume that architects did not want a General Building Act. On the contrary, he thought architects as a body would welcome such a measure, provided that it did not enter into details, which must be dealt with under by-laws. That there must be by-laws was perfectly clear, in order to check the vile building always being carried on by what in Liverpool were called "jerry" builders, but who were better known in London as "mushroom" or "field" builders. But, surely, by-laws which were necessary to guard against the malpractices of such men should not be foisted upon architects, who were men of education and professional responsibility.

The Chairman, in closing the discussion, said he hardly saw why, if by-laws were necessary, architects should be above them. Such by-laws were to restrain dishonest and "scamped" work; why, then, should architects object to them? He had been disgusted with some of the vile work which was carried on in the suburbs of London under the name of building. As to the possibility of a uniform Act of Parliament relating to building, he did not at all believe in it. Mr. Ellice-Clark had, he thought, shown good reason for the deposit of plans.

Mr. Boulton, in the course of his reply, said that reference had been made by Dr. Thorne-Thorne to his (Mr. Boulton's) allusion to the medical profession. He did not speak in condemnatory terms of that profession, but he did think that when a medical man was afflicted with a craze for sanitary reform he was one of the most visionary and tiresome men that could be conceived. Dr. Thorne had spoken of overcrowding. How was overcrowding defined by medical men? Dr. Richardson, the great founder of the City of Hygiene, had said that there should not be more than five families, or say thirty persons, to the acre. On the other hand, the Peabody Trustees, in their new buildings, brought together 1,500 people to the acre, among whom the rate of mortality was only 17 per thousand, whereas the rate of mortality of London as a whole was 21 or 22 per thousand. Were the Peabody Trustees to be accused of overcrowding? After replying to various other points



mentioned in the discussion, Mr. Boulé said he was forced to come to the conclusion that he and the elder members of the profession would have passed away, and the younger members would have become very grey indeed, before the Legislature passed such a General Building Act as he believed to be desirable.

The proceedings then terminated.

#### THE NEW IMPERIAL PARLIAMENT HOUSE OF GERMANY.

As we had anticipated, the competition opened by the German Government for new designs for the projected House of the Imperial Parliament, is confined to "German architects." The phrase is ambiguous, but it is interpreted to include any architects whose mother-tongue is German, or who are subjects of the German Emperor; and, accordingly, architects belonging to the German-speaking provinces of Austria, or the German Cantons of Switzerland, will undoubtedly be found amongst the actual competitors. With regard to the terms of the competition, they have been generally received in Germany with approval. There are to be ten premiums, divided as follows:—Two first prizes of 15,000 marks, or 750*l.*, each; three second prizes of 10,000 marks, or 500*l.*, each; and five third prizes of 8,000 marks, or 400*l.*, each. In addition to these the jury is empowered to recommend ten additional designs for purchase by the Government, at 2,000 marks, or 100*l.*, each. Moreover, the four German architects who won prizes in the first competition in 1872 are invited to participate in the present competition, and, in case they enter it, are assured an honorarium of 3,000 marks, or 150*l.*, besides the chance of gaining one of the ten, or perhaps we should say twenty, premiums. The total funds thus available for participants in the competition is 107,000 marks, or 5,350*l.*, an amount unprecedented in the history of such affairs in Germany. The novel method of distribution of prizes in this competition,—the fact that there are two first and three second prizes, besides five third prizes,—has given considerable satisfaction in architectural circles in Germany.

The time allowed for so large a task may seem too limited. The designs have to be sent in before twelve o'clock noon of June the 10th next, and this condition is to be enforced without any exception. The competition is to be anonymous, a motto being attached to each design, and the competitor's name enclosed in a sealed envelope bearing the same motto.

There will be a public exhibition of the designs only after the decision of the jury has been taken as to those which are to be rewarded or purchased. The jury is to consist of the committee of thirteen members appointed by the Imperial Parliament to carry out the project, together with eight professional architects who have not entered as participants in the competition.

#### THE DECORATION OF THE PANTHEON, PARIS.

The paintings and sculptures ordered by the French Government for the decoration of the Pantheon include the following works:—"Attila and his Army before Paris," and "St. Genevieve exhorting the People to be Traquil," both by M. Delannay, 50,000*fr.*; 2. "Scenes from the Life of Charlemagne," by M. Henri Lévy, 50,000*fr.*; 3. "Scenes from the Life of King Clovis," and the same "King's Vow before the Battle of Tolbiac," by M. Blanc, 50,000*fr.*; 4. "Preaching of St. Dionysius," by M. Galland, 20,000*fr.*; 5. Marble Group of Three Persons, by M. Monagny, sculptor, 20,000*fr.*; 6. "The Prophet Eli," by M. Mercé, sculptor, 20,000*fr.* Besides the two last-mentioned sculptures, MM. Cavalier, Jonffroy, Oubé, Falgüère, Frémier, Hialle, and Perrand, have been charged with the execution of statues of saints in white marble, the price agreed upon in each case being 20,000*fr.* Some of the paintings and pieces of Sculpture here mentioned are already finished, others approaching completion. The Pantheon will thus, before long, present the spectator with a series of works by the best artists and sculptors of modern France.

The Town Council of Great Yarmouth, on Tuesday last, unanimously appointed Mr. J. W. Cookrill, of Glencoe House, Gorleston, Borough Surveyor, in place of the late Mr. H. H. Baker.

#### PASSENGER TRAFFIC ON RAILWAYS.

ALTHOUGH passenger traffic on railways grows greatly in periods of commercial prosperity, yet it knows usually a very great enlargement from period to period only in one class. The great volume of passenger traffic gravitates towards the lowest level,—that is to say, into the third class. In the past period, which is now being reported on, there has been a continuance of this feature marked in these columns some time ago. A few instances will fittingly illustrate it. In the case of the Great Western, we have to carry the comparison back over two years, because a year ago the accounts were furnished for five months only. But so contrasting corresponding half-years we obtain the following results. Great Western passengers:—

	1880.	1881.
First class .....	895,535	1,056,885
Second class .....	3,735,346	4,377,493
Third class .....	17,967,399	19,143,687
Total .....	22,658,280	24,577,965

We have here, then, a general increase of about 61,000 in the first class; of 580,000 in the second class; and of the vast number of 1,800,000 in the third class,—an increase that is exceptional in being so distributed, as we shall see. In the case of the North-Eastern we have an increase of a very different character, as the following comparison will show. For six months ending each year named, the following were the numbers of North-Eastern passengers:—

	1880.	1881.
First class .....	539,175	554,173
Second class .....	651,993	639,914
Third class .....	14,936,198	15,712,311
Total .....	15,723,276	16,995,608

This is, perhaps, the most striking decline of all. There has been in the total an increase of 1,100,000, but it has not been contributed to by all three classes. On the contrary, the second class shows a serious decrease, and this in the face of the fact that there was a reduction of the charges for first and second class fares. In the case of the upper class there is a slight increase, the great bulk of the addition having risen, however, in the lowest class. And it is notable that on this great railway the number of the second-class passengers is now far below what it was when the line was not half of its present size. Coming now to the return of the Great Northern Railway, we find a variation again in the character of the return. The following gives for the same two periods of six months the numbers of Great Northern passengers:—

	1880.	1881.
First class .....	513,369	497,186
Second class .....	1,662,716	1,676,724
Third class .....	10,066,323	10,474,126
Total .....	11,642,410	12,047,323

The class that has decreased on this line is, it will be seen, the first class,—the second class passengers showing a small increase, and the great bulk of the addition arising in the third class traffic. A somewhat similar decrease is shown on the Midland Railway, where first class is shown to have suffered slightly, and,—there being no intermediate class,—the whole of the gain is in the lowest class. The following figures are interesting, as showing the number of passengers for the same two contrasted half-years. Of Midland Railway passengers:—

	1880.	1881.
First class .....	1,021,042	892,337
Second class .....	19,455,061	14,943,196
Third class .....	14,456,723	15,030,535

This instance is a marked proof of the gravitation of travel downwards, although all that was possible had been done to retain it in its usual grooves. Finally, we may give, for the same two periods of six months, the following figures on passengers on the Manchester, Sheffield, and Lincolnshire Railway:—

	1880.	1881.
First class .....	145,131	130,830
Second class .....	247,741	234,561
Third class .....	4,995,494	4,995,618
Total .....	5,288,366	5,361,009

In this instance there has been a decrease in the number of the passengers by both of the upper classes, and the third class shows an increase that counterbalances this, and gives the addition to the total that is observable.

It will be seen that the general testimony of the figures is to show a decrease in the number of the passengers travelling by the upper classes. In some instances, it is the first that shows the declension, but more usually the intermediate

class suffers, and occasionally both. It will be remembered from our previous articles on the subject that the declension has been some time in progress, and thus it is clear that there is a great decrease in the number of passengers in the upper classes, and especially in the second-class passengers. It is true that in that period there has been a trading depression that must have aided the rapidity of the declension, but as against that is to be set the fact that the mileage of the railways has been largely increased, and that they have tapped fresh streams of traffic, and also that the total number of the passengers carried is far more than it was a few years ago, the conclusion must be drawn that second-class railway traffic is decaying, and, aided by the action of the Midland Railway, the public travelling on railways is gradually preparing itself for a division into two classes only.

#### NEWS FROM BERLIN.

THE opening of the Berlin *Stadt-Bahn*, or metropolitan railway, has been a great success. The rush of would-be travellers in the first few days was far greater than could be accommodated. There were 64,392 tickets taken on the first Sunday after the opening, and probably twice as many might have been sold had there been room for more travellers in the trains. Thousands were turned away from every station. With a little more time and experience of the habits of the population, the company will be equal to any demands that may be made upon it.

The opening of the line has given an extraordinary stimulus to house-building in the outskirts of Berlin. A very large number of building-plots have changed hands there within the past two or three weeks, at constantly increasing prices. It would be a great boon to the vast population if the extension of the means of communication should lead to the multiplication of small houses in place of the gigantic barracks in which most of the Berliners are lodged.

Another sign of the growth of the German capital has been the permission granted to a steam-ship company to run a regular line of passenger vessels through the city and down the Lower Spree to Spandau. It is said that English capital is invested in this enterprise, and that there are to be forty small vessels built in England for the use of the new company on the Spree.

Finally, we have to mention an interesting little fact in connexion with the Crown Princess of Germany (the Princess Royal of England). In the Hohenzollern Museum at Berlin there was recently deposited a marble bust of the German Empress. It was universally acknowledged to be a striking likeness, and the execution of the work is excellent. It is now announced that the bust is from the chisel of the Crown Princess, who had already distinguished herself, in many Exhibitions, by her paintings and drawings. By mistake, the Empress Augusta's bust has been attributed to the Crown Prince of Germany. It is really the work of his wife, the English princess, who has been doing for German art industry what her lamented father, Prince Albert, did for that of England.

#### ROMAN REMAINS NEAR LIEGE.

AN interesting discovery of Roman remains was made a few days back at Angleur, a village near Liège. Until this discovery it was not known that the Romans had ever had any settlements in the neighbourhood of the city in question. The remains consist of about twenty articles of ancient bronze. They were found, about 2 ft. below the surface of the ground, by a brickmaker's labourer. The majority of the articles are of excellent workmanship; the rest are of much rougher execution, but all are covered with a beautiful patina. The articles comprise two female statuettes; the statuette of a young man raising his hands to heaven; two other female statuettes; three Mercury heads with beard; two tiger heads; one lion with paw raised; piece of a rectangular tube; a Roman water-cock, &c. The workmanship of the statuettes is excellent,—vying, in fact, with that of the most beautiful objects found at Pompeii. These objects are supposed to have been produced in Italy, while those of rougher execution were probably made near the spot. The tubes and other objects were found in layers



one above another; and it is regarded as almost certain that they formed part of a monumental fountain, adorning the garden or villa of a wealthy Roman. The judgment of archaeologists who have seen the articles is that they belong to the age of the Antonines, or the third century after Christ. The proprietor of the objects is M. Emile de Laveleye, who has already exhibited them before the Belgian Academy of Sciences. It is hoped that the excavations, on the spot where they were found, may lead to further discoveries.

#### ST. LORENZO IN DAMASO, ROME.

ITALY, the home of art, has of late been the scene of not a few restorations and threatened renovations, which appear calculated to show that in many circles in that country artistic feeling has died or is dying out. One of the most recent instances of the Vandalism of the restoration fever is reported by a German architect, M. Nienburg, as having been perpetrated in the Church of St. Lorenzo in Damaso, at Rome. Of this edifice, which is inclosed, together with the Cancellaria, in a common *facade*, the *Cicerone* says, "The Church of St. Lorenzo, as newly built by Bramante, presents still, in spite of some modern alterations, one of the most beautiful and peculiar interiors. It is a large vaulted rectangle, with avenues of richly-detailed pillars on three sides. Behind is the Tribune, and the light comes almost exclusively from above, through the large semicircular window to the left. It is rich in picturesquely-lighted glimpses of various kinds, and is charming through the beauty of the space and the effect of the light." Of all this, according to Herr Nienburg, there is now hardly anything left. The vaulted roof has been replaced by a heavily-gilt cassette ceiling; while a monotonous side-light coming in from a number of round-arched windows only serves to show the tastelessness of the decorative work and the large glaring wall paintings. Those who have drawings or paintings of the church in its former state are informed that such works will now be worth much more than formerly. There are no photographs of the interior of St. Lorenzo as it appeared before this barbarous restoration.

#### THE GLOSSOGRAPH.

HERR A. GENTILI, a well-known member of the Austrian Society of Architects and Engineers, has invented an instrument which, based upon the physiological laws of language, and acting automatically, transforms the movements of the several organs of speech into visible signs, and thus fixes the spoken word itself, without the aid of another person. In this respect it differs essentially from the telephones and phonograph, which rest upon acoustic principles. The glossograph consists of an ingenious combination of delicate levers, which rest upon the tongue and lips of the speaker, and as delicate blades or paddles, which, placed under the nostrils, are vibrated by the out-flowing breath, in the same manner as the levers are set in motion by the movements of the tongue and lips. The levers and blades transmit the vibration to pencils which transcribe the several signs upon a strip of paper drawn along by a mechanical arrangement. The variety of these signs depends upon the nature of the vowels and consonants, to produce which the several organs of speech are called upon to perform their various functions. Similar to shorthand or stenography, a special system of writing,—it may be called glossography,—is created, which is based upon the principle of syllable construction and combination of consonants, and is especially suitable for being perfected for those languages the orthography of which differs least from the phonetic record of the apparatus. Amongst them may be classed German and Italian.

The instrument, as described, would seem somewhat delicate, and to require careful manipulation, but what its future may be cannot be said. We should add that in reporting proceedings in Parliament or courts of law it is not necessary that the speaker should use the apparatus himself. It is sufficient that a second person should manipulate, or, rather, articulate, it, by repeating in a low voice the words of the speaker, which is perfectly sufficient for rendering the signs distinct. The inventor has already had an opportunity of introducing the glossograph to a large audience

of the Physico-Chemical Institute of the University of Leipzig, on January 29. The instrument was made by Messrs. E. Kraft & Sohn, of Vienna.

#### ST. CLEMENT'S CHURCH, CITY ROAD.

This church has been built in the midst of a thickly-populated district of small houses, and lies just off the City-road, between Bath-street, Lever-street, and Nelson-street, near the Eagle. The site is the gift of the Ecclesiastical Commissioners, and being a cramped one, the church does not stand east and west, but of necessity follows the lines of the site. The quasi west wall of the church is the party-wall between the church and the schools, which were built some few years since. One heating-chamber, beneath the south-west corner of the nave, serves for both church and schools. The church has been erected from the designs and under the superintendence of Mr. Butterfield, architect, and consists of a nave with a north aisle, a porch, and a chancel, with a transept, in which the organ is placed, and upper and lower vestries adjoining it. A bell gable, carrying two bells, surmounts the end wall of the nave. These buildings leave but little spare room on the site.

The total internal length of the church is 135 ft., of which 41 ft. belong to the chancel. The width of both nave and chancel is 28 ft. They are both roofed throughout at the same level. Double principals with tie-beams, bearing a large cross, and with traciered brackets springing from stone shafts, mark the division between the nave and the chancel. A turret staircase, entered by a door in the side wall, leads to the roof and the gutter. A passage formed between these double principals gives access as well to the gutters on the opposite side of the church. The walls are built of grey stock bricks, with Bath stone dressings. Black bricks are used in bands and patterns to relieve the brickwork externally, and red bricks, with a few black headers, give colour to the walls internally. The shafts of the arch between the chancel and the transept, and the shafts of the triple arcaded picture panel beneath the altar-window, are of dark Devon marble.

This picture, formed in painted tiles, represents the Nativity, with the adoration of the shepherds on one side, and of the wise men on the other. The window above is filled with stained glass, chiefly grisaille. In the centre light is the figure of St. Clement; and in the two lights on either side are the figures of St. Peter and St. Paul. The large foliated circle in the window-head contains a representation of the Crucifixion, with the Virgin on one side and St. John on the other. Angels carrying censers appear in the smaller foil circles. The reredos is formed of traciered panels inlaid with coloured tiles. In the centre panel is a white marble cross, of bold design, relieved with gold, and enclosed in a vesica standing upon a Derbyshire fossil marble super-altar. A small amount of colour has been introduced on the stonework of the reredos, and also in the credence and sedilia recesses. Staffordshire tiles are used as a lining for the lower parts of the walls everywhere throughout the church. The floors beneath the seats are formed of solid wooden blocks, grooved and tongued, and laid herring-bone fashion. The chancel-fittings, the pulpit, and the Bible-desk, are of walnut and walnut intermixed.

#### THE WATER GATE.

"The Water Gate" is the title given to a drawing executed in pen and ink by Mr. H. W. Brewer, and exhibited in the recent collection of works in black and white at the Egyptian Hall, Piccadilly. As will be seen from our reproduction, the drawing represents an old town of the German type, with a cathedral or abbey church in the middle distance, old walls and a gateway in the foreground, and a ruined castle in the distance. A rapid river, crossed by a bridge, rushes down from the hills and joins a larger stream in the immediate foreground. The structure, which gives the title to the drawing, is one of those low-covered and towered gateways which are found in many Mediaeval towns, both at home and abroad, leading from the river to the interior of the fortifications. Traitors' Gate at the Tower and the Water Gate at Norwich are examples in point.

One of the chief objects of the artist has been to illustrate the kind of sites selected for town building by our Mediaeval forefathers, and to which we have frequently alluded, especially in the descriptions given of Limburg-on-the-Lahn, Erfurt, &c.

The large church crowning the height has an apse with procession aisle surrounding it, but no radiating chapels; two towers crowned with spires rise over the transepts, and at the west end of the nave are two old Romanesque turrets.

The whole design shows a very extensive knowledge of German Mediaeval architecture, and a most careful study of local peculiarities. This is indicated, especially by the gables and roofs of the houses, which are all of one type, such as may be seen at Boppard and that neighbourhood. The styles of architecture exhibited in the great church are in strict accord with the local traditions of the same neighbourhood. The artistic skill and merit of the work as a composition may be estimated from our reproduction.

#### THE CAPITAL AND COUNTIES BANK, ALDERSHOTT BRANCH.

The new premises for the Aldershott Branch of the Capital and Counties Bank (Threadneedle-street), which have been recently erected from the designs of Mr. Fred. Mew, of 30, Doughty-street, Mecklenburgh-square, are situated in the Victoria-road, at its junction with the Elms-road, facing Wellington-street. The building, which is of brick, with red facings, having the doorway, cornices, and other dressings executed in Dumfries stone, comprises accommodation for the residence of the manager. The telling-room, occupying the whole of the frontage, is paved with Minton's tiles, and has a ceiling of Messrs. Dennett & Ingie's fireproof arching, treated constructionally.

The works, including the mahogany counter and fittings of the telling-room, have been carried out by Mr. William Garland, builder, of Elms-road, Aldershott.

#### GLASS SHELTERS IN STREETS.

SIR,—When a lady gives a "reception," or any kind of party, it is becoming a custom, if it can be afforded, to protect her guests from the wet, by erecting a temporary portico, which covers the pavement, and thus to enable her friends to pass from their carriages into her house without discomfort and risk to health.

2. It appears to me that it would accord with increasing civilisation to have some tasteful permanent arrangement for getting into the house under shelter at all times, and I have suggested to Mr. W. H. Lascelles, the well-known builder of glass structures, to send me some designs for accomplishing this object, which I have his permission to ask you to insert in the *Builder*. I forward you three of these designs, and make the request in order that your readers and the public in general may be induced to consider the suggestion.

3. I am well aware that there are difficulties of various kinds which must be looked in the face. First, there is the Metropolitan Board of Works and its rules; secondly, there are the vestry authorities; and, thirdly, there are the neighbours on each side of the proposed structure; but I think all these parties will be guided in their views by common sense and public convenience.

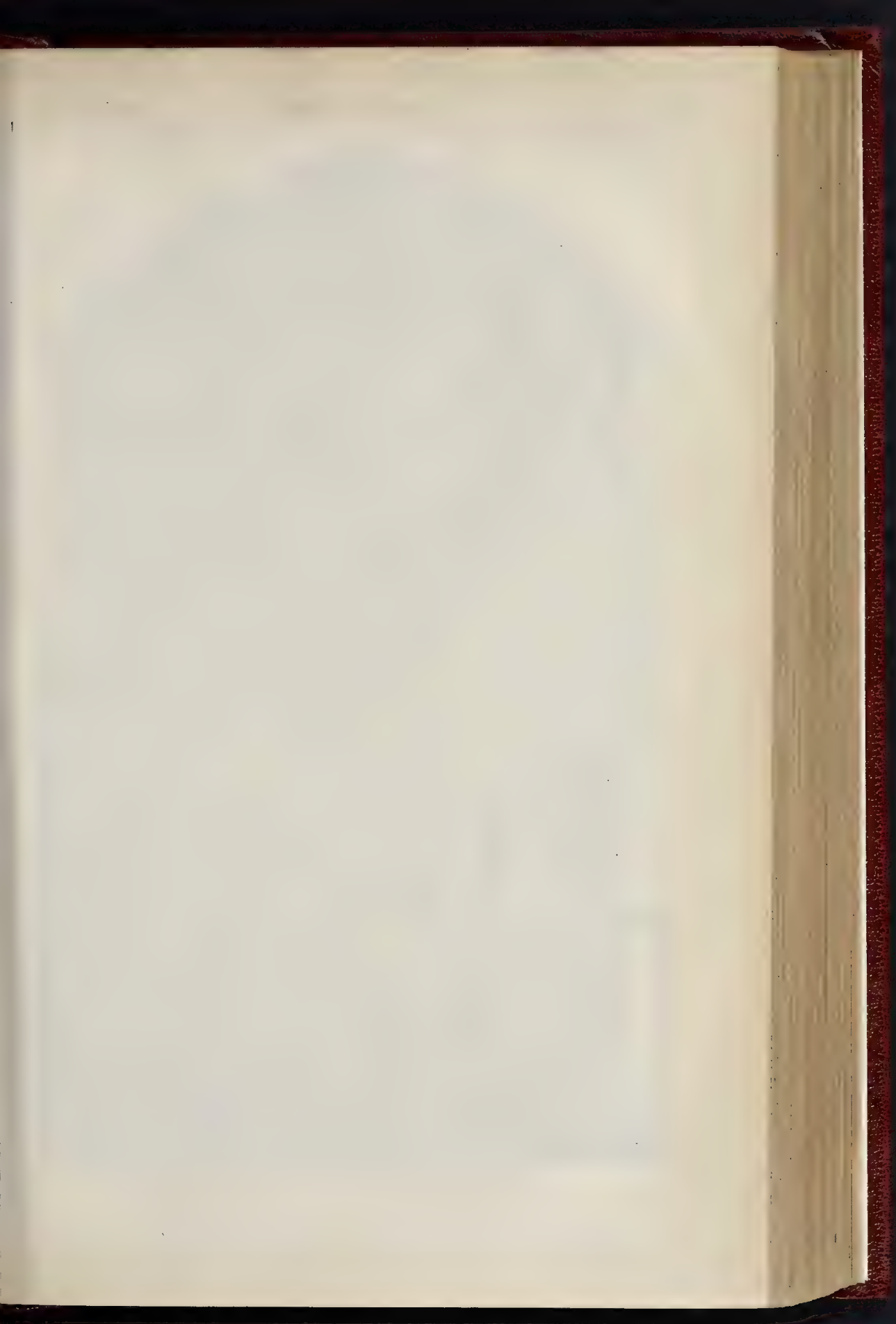
4. I propose that these structures should be of glass and iron; that they should not allow of any dripping on the pavement; and that there should be no obstruction whatever on the pavement,—indeed, not so much as at present, as by a great umbrella held by a passenger; and that they should be ornamental, so relieving the dull monotony of street houses.

5. If you obtain from the public a favourable verdict on this suggestion, I will take measures for obtaining from the Metropolitan Board permission to try an experiment.

HENRY COLE.

Mr. and Mrs. Gorman Reed's Entertainment.—On Tuesday next, February 28th, Messrs. Alfred Reed and Corney Grain will produce a new entertainment in two parts, entitled "The Head of the Poll," written by Arthur Law, the music by Eaton Fanning; and Mr. Corney Grain will give a new musical sketch, entitled "Not at Home."

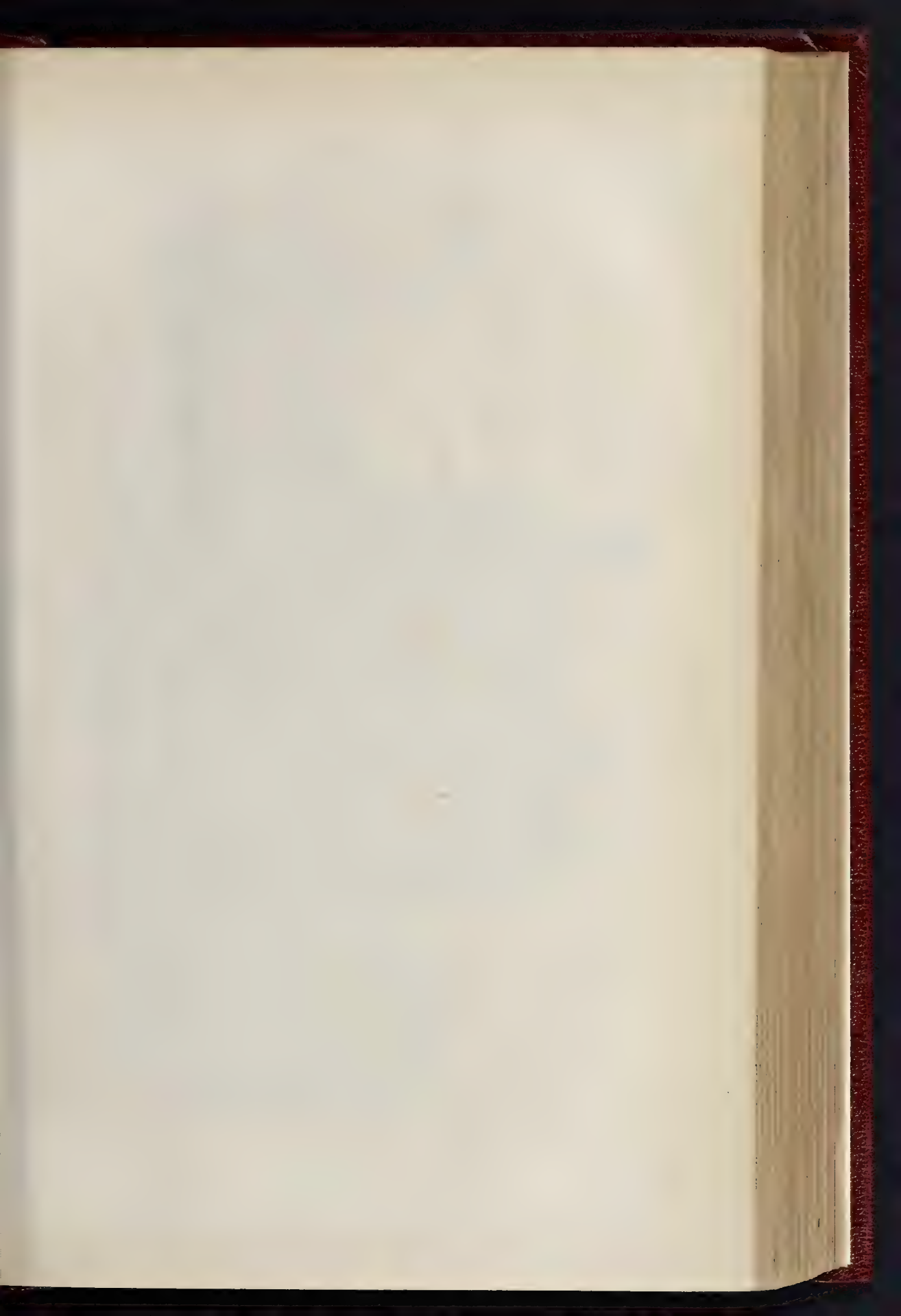




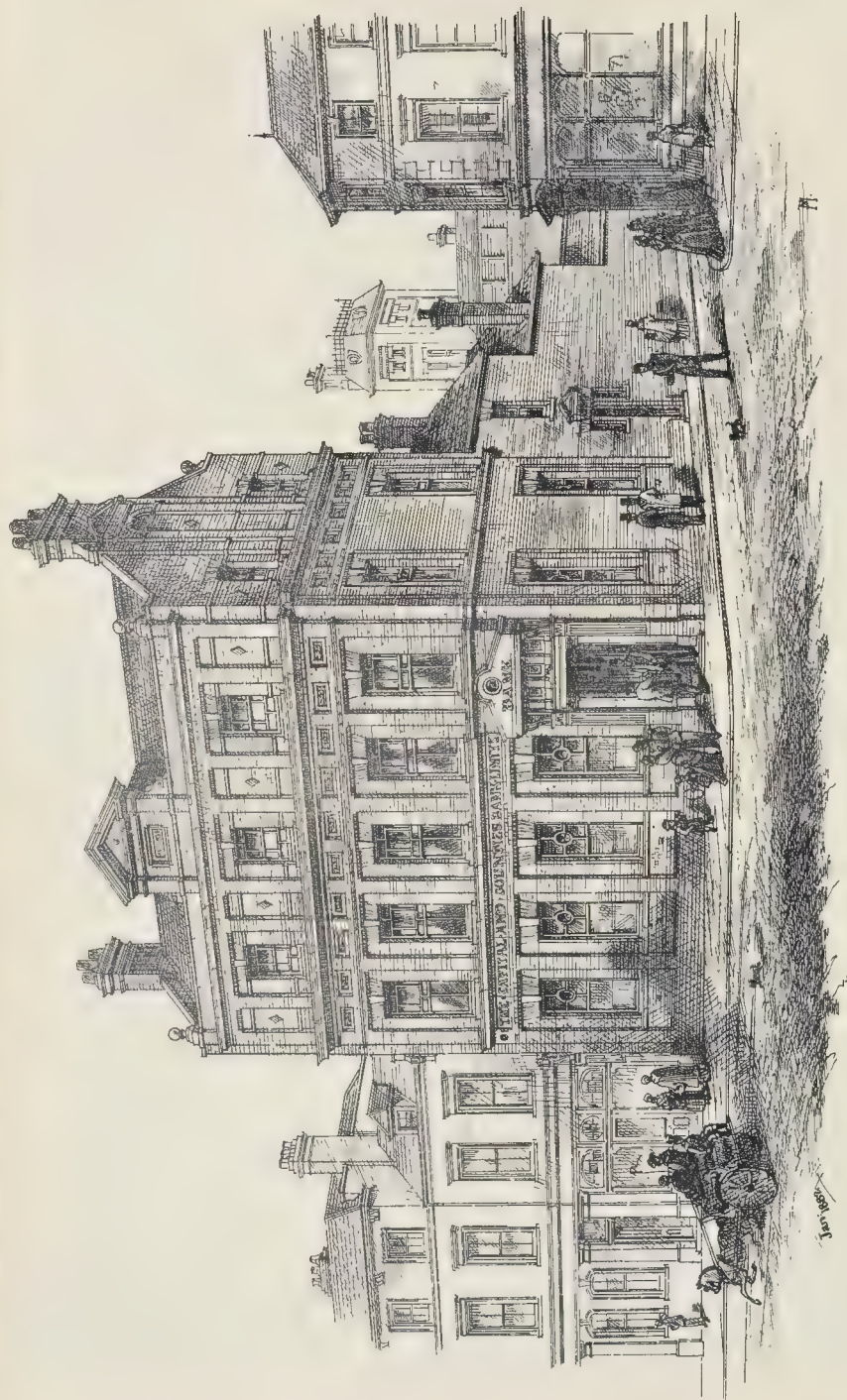


ST. CLEMENT'S CHURCH, CITY ROAD.—MR. BUTTERFIELD, ARCHITECT.



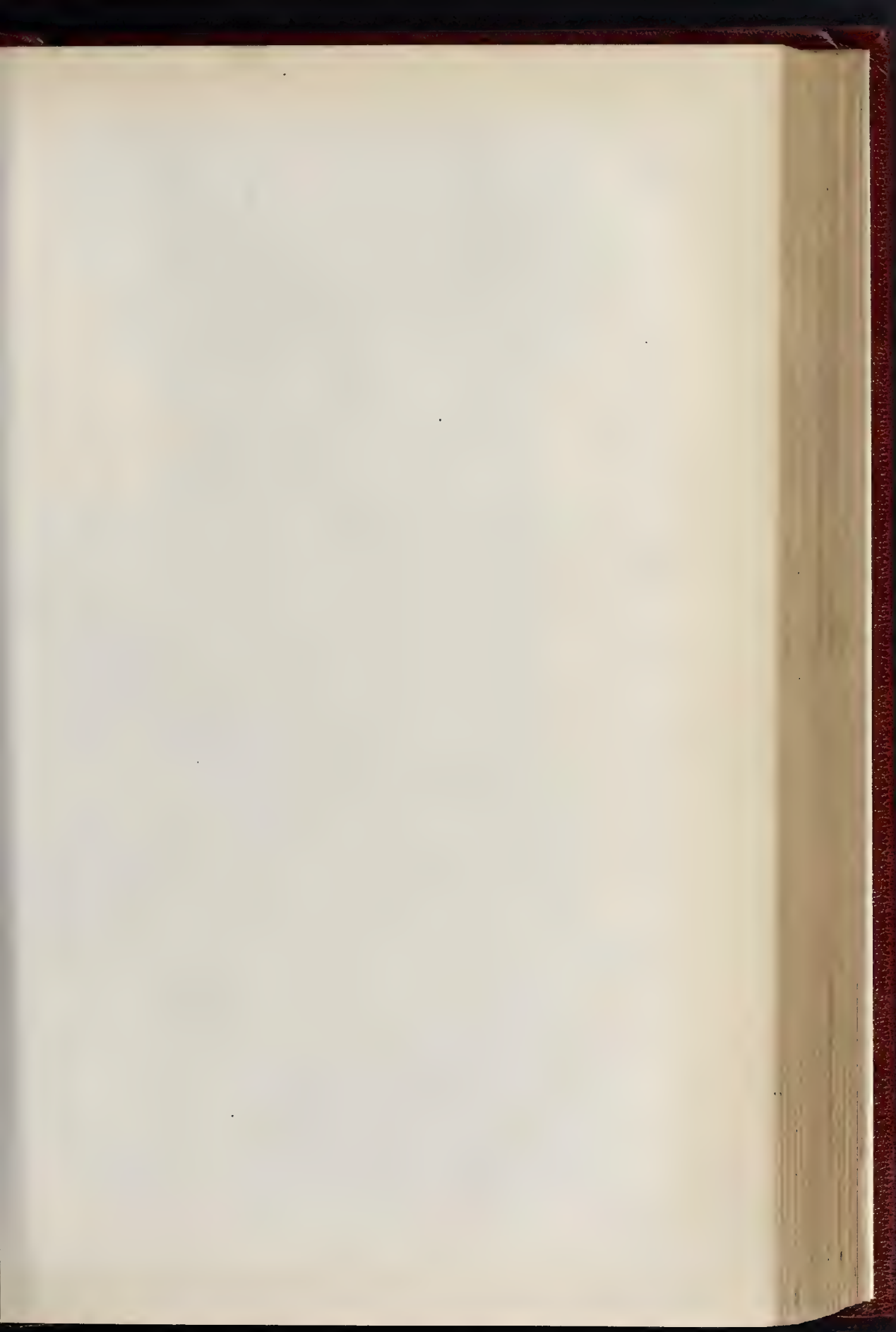


THE BUILDER. FEB. 25, 1882

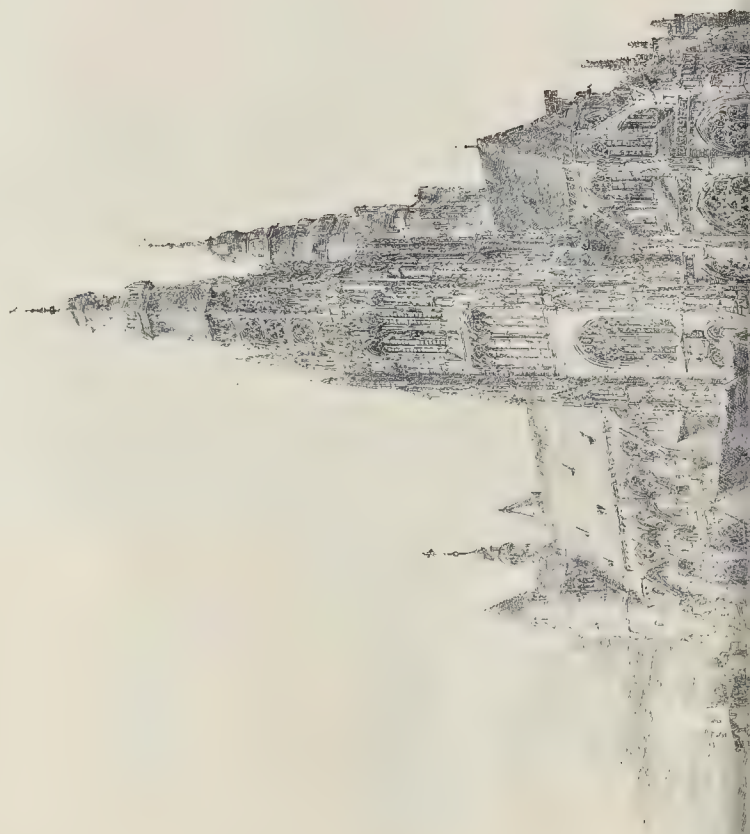


★ New Premises Aldershot Branch Capital & Counties Bank. ★

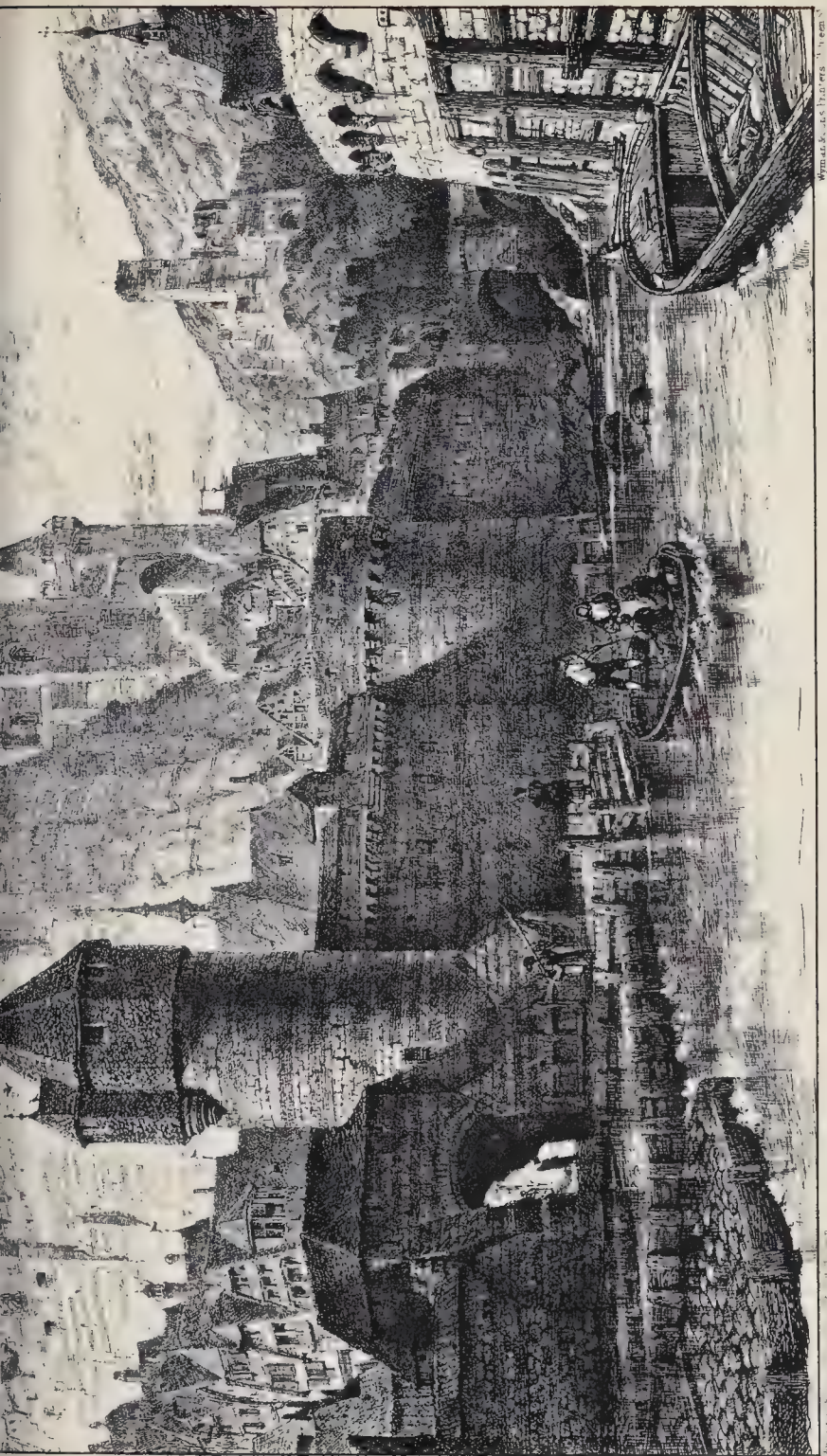




THE BUILDER, FEB. 25, 1882.







THE WATER GATE: A COMPOSITION IN PEN AND INK, BY H. W. BREWER.

*From the Black and White Exhibition, Dudley Gallery.*







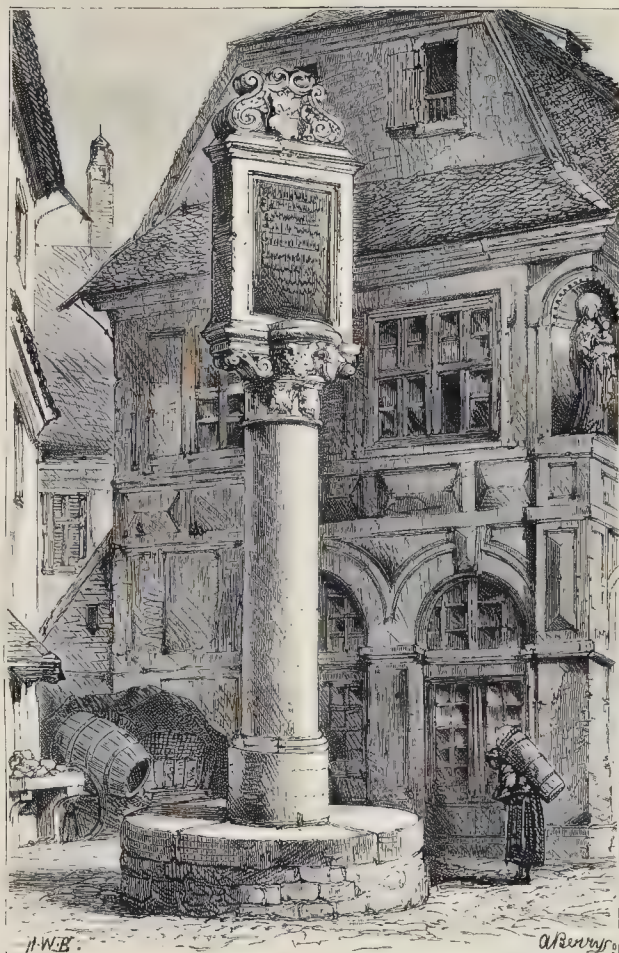
B. J. L.

SKETCHES OF PROPOSED COVERED WAY FOR SIR HENRY COLE.

Wyman & Sons Printers







BISHOP ZOBEL'S PILLAR, WURZBURG.

## BISHOP ZOBEL'S PILLAR, WURZBURG.

THE memorial pillar of Bishop Zobel, represented by one of our illustrations, was set up shortly after the year 1558, to commemorate one of those terrible acts of violence which disgraced Germany during the sixteenth century. The circumstances may be thus briefly related:—

Bishop Melchior von Zobel had entered into a dispute with a knight named Grumbach concerning the possession of certain lands, the Bishop maintaining that they were the property of the diocese, and Grumbach as obstinately maintaining that they formed a portion of his paternal estate. Grumbach took possession of the lands, in punishment for which act (Grumbach was a vassal of the bishop's) the Bishop seized Grumbach's house in Wurzburg (this house still exists, and has a very picturesque chapel, which we may one day illustrate). The latter, in a fit of rage, joined Albert Alciades, of Brandenburg, who was at that time making war against the Prince Bishop of Wurzburg. They took Wurzburg, and Grumbach forced the Bishop to pay down a large sum of money. The Emperor, however, interfered, and insisted upon the money being immediately refunded. Grum-

bach then retired to his castle at Rimpar, and thence joined in various expeditions, which had for their object revenge, and most atrocious cruelties were perpetrated by him and his myrmidons, so much so that the Bishop publicly denounced him, and he was laid under the ban of the Empire. This so enraged Grumbach that he determined to murder the Bishop. He disguised himself, and as the Bishop was going in procession from the palace to the cathedral, Grumbach shot him upon the spot marked by this pillar. A second similar pillar marks the place where the last sacraments were administered; and a third, now within the castle, but before the enlargement of the building, under Vauban Petriani and B. Newman, just without the principal gate, marks the spot where the Bishop expired. For some years Grumbach succeeded in escaping justice for his crime, and was protected by Albert Alciades, but he was ultimately captured by the Emperor and put to death; his castle of Rimpar, which still exists, was handed over to the diocese of Wurzburg. The columns were erected by the great Bishop of Wurzburg, Julius Hector von Meapfelbrun, who succeeded to the see and principality in 1573. The one we give is built of red sandstone, with an inscribed tablet of bronze.

## PHYSICAL SCIENCE IN RELATION TO ARCHITECTURE.

## ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this association, held on the 17th inst., Mr. Gilbert R. Redgrave, vice-president, in the chair, the following paper on this subject was read by Mr. J. Slater, B.A.:—

Nearly two thousand years ago, a Roman writer whose name is probably familiar enough to you all, but an acquaintance with whose works is, I think, becoming more and more rare among architectural students, wrote a treatise on architecture, and I venture to think it would be to our advantage occasionally to look into his pages and take to heart some of his maxims; for, antiquated as much of the work in question is, there is hardly a chapter from which a few useful hints may not be obtained. I allude, of course, to Vitruvius, who gives the following description of what an architect's attainments ought to be. "An architect," he says, "should be ingenious and apt in the acquisition of knowledge, a good writer, a skilful draughtsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences





both of law and of physic, nor of the motions, laws, and relations to each other of the heavenly bodies," and then he goes on to explain at length in what ways so wide a knowledge will be useful to the architect. Several centuries later, in a quarter of the globe far distant from where Vitruvius wrote, the author of an old Hindoo treatise on architecture quoted by Ram Raz in his essay on that subject, lays down as one of the principal qualifications of an architect that he should be "conversant in all the sciences." Thus, you see that both these writers give even greater weight to the scientific than to the artistic side of the profession. Science then was, of course, a very different matter from what it is now, and such a definition as I have quoted of an architect's qualifications would now, almost universally, be deemed too encyclopaedic. It appears to me that the present century has seen the reaction against what was till quite recently looked upon as the prosaic side of the profession; the pendulum has swung to the artistic side, and, to a large extent, with very good results. I would at this early stage guard myself against being misunderstood in anything that I may have to say as being in the slightest degree derogatory to the highest and noblest side of our profession,—the artistic. We must all be artists, and have an appreciation for all that is beautiful in art, or our architecture would be but dry bones, without any spirit at all in it; but there is a danger, and a very real one, of architecture degenerating into mere draughtsmanship, and I believe it is because the general public have seen and noticed this tendency,—we can never see ourselves quite as others see us,—that there has resulted the general want of appreciation of our labours as professional men, which has so frequently been remarked upon and deplored. Now the great and prominent feature of the latter part of this nineteenth century is the enormous advance made by science, and particularly physical science, amounting almost to a revolution. We, as architects, must keep *au courant* with the times. Now, less than ever, can the scientific side of our profession be ignored. That however highly, and with however much enthusiasm we may cultivate art, we shall still find science of the greatest assistance, I have ventured to read this paper, the object of which will be,—and I must be pardoned if many of the facts which I shall bring before you are of the most commonplace trite description,—to show in how many ways, and how intimately, architecture is allied with physical science. What is physical science? It is simply a knowledge of nature and nature's laws, and I shall ask you to look at the various branches of science somewhat in detail, in order to see how these laws act and how they affect us in our work.

First as to *Geology*. It is a mere truism to assert that the question of the foundations of any building is the most important that one can have to decide, for if there be anything wrong here, the results may be most serious. Nothing can be simpler than the general theoretical rules as to depth and width of concrete required for the walls of a building, and yet there are few things in practice that require so much thought and cause so much anxiety to the architect as deciding, in any particular case, whether the excavations have been taken down deep enough. It frequently happens that a beautifully sound bottom may have been reached in one place, and that deeper excavation accidentally made close by may disclose the fact that the good bottom was really no bottom at all, but merely a thin layer resting on soft and bad ground. Again, in rocky districts "faults" frequently occur, which may cause infinite trouble to the architect if not discovered in time. I have a case in my memory now when I was superintending the erection of a building in the neighbourhood of Tunbridge Wells, where all the foundations rested apparently on the solid rock, but in one place where, from some cause, suspicion was aroused that the rock was not quite solid, a slight excavation showed that a thin vein of soft clay ran for some distance right through the rock, separating it like a seam. Now, in many cases of this kind, a very slight knowledge of geology, or of what Professor Huxley has called "physiography," would be of the greatest possible service to the architect. A walk in the immediate neighbourhood of the proposed site of a building, with a careful observation of the lie of the ground, of the inclination of the strata where they may be exposed by a cutting, or watercourse, the

direction of the watercourses, the nature of the soil, and various other natural features, would supply indications to the mind of an elementary geologist which might induce him to have an examination made of a portion of the site upon which he proposed to build, the result of which would frequently lead to the abandonment of the exact spot fixed upon, and to a great saving of subsequent expense to the client. Where buildings are erected on the side of a hill, the security of the foundation and the likelihood of a landslip occurring, depend entirely upon the inclination of the strata. If the slope is inward, buildings may be erected with perfect safety; if outwards, very careful and often costly precautions will have to be taken. A slight knowledge of geology would also frequently enable an architect to judge whether there was any risk of percolation of water on to the site, or of pollution from neighbouring sources of the water supply, if one has to be obtained. One very frequent cause of injury to buildings that have been erected for some time, arises from the construction of deep drains near them, or from the erection of buildings whose foundations are carried down much lower, and a knowledge of the nature of soils, would often prevent this, as the geologist would be aware that certain soils which support weight excellently so long as they hold water, crack and shrink invariably if they are drained. I believe I am correct in stating that if a case of this kind occurs when the only cause of settlement is from the shrinkage of the soil on which a building is erected through the tapping of the subterranean water, no legal remedy can be obtained. Do not suppose that I am advocating that we should all emulate the attainments of a Sir Charles Lyell, or anything of that sort: such knowledge as I have been speaking of could be attained by any one through the careful perusal of a good handbook combined with,—and this is the most important thing,—practical observation of any broken district conveniently at hand.

Allied to geology, and coming within the scope of physiography, is *Meteorology*. This, the youngest of the sciences, is still a subject of great interest to all concerned in building, and one that we ought all to know something about. The facilities for travel are now so great, that an architect is almost certain, sooner or later, to be called upon to superintend works in very different parts of England, and even on the Continent, and thence an acquaintance with the climatic conditions of the various districts is very desirable. The quantity of rainfall, the amount of snow in winter, the heat of summer, the direction of the prevalent winds, are all elements which have to be considered in the erection of a private house or public institution, and must modify their construction, and unless attention is paid to these points, failure is likely to occur. Moreover, it is by no means unusual for an English architect to be asked to design a building for one of our colonies or India, and in such a case a correct appreciation of the climatic conditions is even more important; for roofs such as we are in the habit of constructing here would be of little avail against tropical rainfall, tropical heat, or tropical winds.

One of the most important branches of physical science to an architect, and one that unfortunately is not always sufficiently recognised, is that of *Chemistry*. We have, over and over again, to form an opinion on the hardness of bricks and their resistance to weather; on the nature of building-stones and their power to resist crushing and absorption of water; on the excellence of a sample of lime or cement; and on the suitability for decorative purposes of various colours and pigments: in every one of these cases a slight knowledge of chemistry will be found of great assistance. A brick is not an ultimate fact of nature, but is a combination of alumina, silica, and water; its properties as a building material depend upon those of the various constituents of which it is composed, and its hardness and weather-resisting powers depend upon the manner in which the clay or clays have been tempered, mixed together, dried, and burned, and a slight knowledge of chemical analysis would frequently enable us to give a better opinion upon a specimen before us than any of the ordinary methods of observation could afford. Take the more important case of the building-stones: we are, all of us, I suppose, constantly receiving circulars and specimens from owners or agents of stone quarries, giving, with a flourish of superlative epithets, the chemical analysis of the stone in question, set out in large figures. How many of

us,—I will not say are able to try for ourselves a simple test or two, but,—have any intelligent idea of what is the real meaning of the chemical analysis given, and what it "connotes," as the logicians say? For us here in London the most important qualities of building stones are their non-absorption of water, and their resistance to the chemical action of the London smoky atmosphere; and I often think as I walk through some of our suburbs and look at the once magnificent, but now rapidly decaying, stone ornaments of the pretentious villas with which we are overwhelmed,—how much we should have been spared had the builders of those edifices possessed but a slight acquaintance with the qualities a stone ought to possess if it is to last here. The question of preserving building-stones from the effect of the terrible London atmosphere is one that has attracted much attention of late years; but it can scarcely yet be said to be satisfactorily settled. I need hardly point out, however, that it is mainly a chemical one. The causes leading to the decay of stone are twofold,—first chemical, and then mechanical. The chemical action of the atmosphere produces a change in the cementitious particles which bind together the silicious grains of a sandstone, and in the entire matter of a limestone, the constituents of which, according to its composition, undergo oxidation or hydration. Where mineral salts occur, new combinations are set up, through the action of the sulphur acids contained in the atmosphere, and in the cases where organic matter exists, this gives rise to nitration. Then, after this chemical action, the stone absorbs more water, and whenever frost occurs mechanical disintegration ensues. If the chemical action can be prevented, all will be well; but, in order to prevent this, we must know accurately the chemical analysis of the stone, and it is just as absurd to think that any one solution applied externally will act as a preservative for all stones, as to think that similar remedies are suitable for all constitutions. It is from this fact having been lost sight of that we have so many diverse opinions as to the value of many of the patented solutions for preventing decay in stone. Even more important is chemical knowledge when dealing with limes and cements. The change that occurs when lime is made into mortar, or when it is calcined, ground, and made into cement, is purely a chemical one, and nearly every different limestone has different combining properties, so that no general rule can be laid down as to the proportions in which lime or cement should be mixed with sand for any particular work; in fact, the whole subject is one that would well repay scientific attention on the part of architects, who, after all, are the people most interested in acquiring an exact knowledge of the subject and with the greatest facilities for studying it without too great an expenditure of time. It would be a very simple matter to take a sample of lime and mix it carefully with various quantities of sand, and test the qualities of the resulting mortar; and if the results obtained are carefully tabulated, after a few years a list of experiments would be obtained of the greatest value, not only to the individual, but to the public. I cannot too strongly impress upon you the fact that science is no abstruse study; that the increase of scientific knowledge is brought about simply by careful observation and experiment on the part of individuals; and that the scientific man is he who quietly observes phenomena, collates facts, and who only draws inferences from a large number of facts which he has himself observed. We architects run real risk of becoming stereotyped in our ideas, from the fact that we are so much brought into contact with builders' men, who are, as a rule, about the most conservative class of people I have ever had to deal with. Take this very question I am now dealing with: we specify that for mortar so many parts of lime shall be compounded with so many parts of sand; but how many of us have ever seen the men using any measure at all? They work by the rule of thumb, and as it generally comes all right in the end, there is a great temptation not to trouble ourselves in the matter. But science never advances by the rule of thumb, and if we refuse to acquiesce in it, even in so small a matter as this, we may at some time or other enjoy the gratification of having added a little to the sum of human knowledge. In the case of colours or varnishes, the increased cost of many of the materials used in their manufacture has led to much adulteration, which, however, is frequently carried out so scien-



tifically, that a great deal more than elementary knowledge of chemistry would be required to enable any one to detect it; but at least we ought to know what kind of adulteration should be guarded against. For instance, if we know that baryta is used instead of lead in many cases, that linseed-oil is adulterated by mixing resin-oil with it, and that turpentine is thinned down by resin spirit and spirit of petroleum, we shall know in what direction to prosecute inquiries if we are suspicious. There is one curious and interesting fact in connexion with colours that is not generally known. White paint is, as you are probably aware, made both from lead as a basis, and from zinc, the latter being much the cheaper of the two. Now the best white paint will very soon begin to get black if sulphuretted hydrogen or any noxious gas has access to it, the lead, which is the basis of it, being at once attacked by these gases. Hence such paint in the interior of a house affords a first-rate test of the sanitary condition of the house, and it would be a very good plan to paint the interior of water-closets in order to ascertain if any sewer-gas makes its way into the house there. In connexion with colours, I may notice the new asbestos paint, which is the result of chemical investigation, and which promises to have most important results in preserving our buildings from fire. Another question of very great interest to us in which chemistry is concerned, is that of the cause and prevention of dry rot. No satisfactory conclusion on this has yet been arrived at, and much good would result from a congress of scientific men deliberating upon it. I believe it is a fact that Swedish white timber is more liable to be attacked by dry rot than Riga or Danzig. This points to the conclusion that it is in the properties of the sap that the mischief lies, and I have a very strong opinion that it will be discovered that the cause of the disease is similar to the cause of diseases to which animals are subject, viz., that there are certain germs in the sap of the tree which under certain favourable conditions set up a species of fermentation, which results in the formation of a fungus that we call dry rot. It would be necessary to carry out a series of experiments extending over several years to prove the accuracy of this opinion, so that I can merely throw it out as a suggestion now; but the way in which the disease spreads is precisely analogous to the method by which other diseases are propagated, and points, in my opinion, very markedly to the germ theory.

That branch of physical science which, twenty years ago, used to be dignified with the comprehensive title of natural philosophy, under which were included statics and dynamics, hydrostatics, optics, and acoustics, has so intimate and well-known a bearing upon an architect's work that I hardly need go into any great detail on this part of my subject. It is impossible to design the smallest cottage without being brought face to face with problems as to the breaking-weight of beams, the strain upon timbers, the thrust against walls, the adequacy and proper distribution of points of support, &c., and all these require for their solution a knowledge of the theory and principles of mechanics. It is quite true that so many tables of scantlings for roofs, floors, &c., exist, that in many instances no one need take the trouble to calculate them for himself, but it is quite impossible to publish tables calculated for all the cases that may occur, and the more extended our practice becomes, the more numerous do we find the cases where tables cannot help us, and where, unless we have principles to go upon, we shall be driven to mere guesswork. The intercommunication columns of the architectural papers prove this very clearly, for there is hardly a number issued that does not contain questions from students or young practitioners asking for information on certain points which they are unable to elucidate by means of the tables only. My experience of tables is that they almost invariably err,—and quite rightly,—on the side of excess of strength, so that, as a rule, no harm will be done by following them, unless (and this risk always exists) a clerical or printer's error has crept in. Then, again, we are constantly called upon to specify for pipes to supply water and gas to a building, and for other pipes to carry off drainage and waste water. Strict scientific rules as to the size and inclination of pipes in relation to their carrying capacity apply to all such questions, and yet they frequently appear to be settled at haphazard. Even such an elementary principle as the tendency of water

to run downhill rather than up, seems occasionally to be ignored; and I myself once heard of a case in a country town where a *soi-disant* architect had thought it necessary for some distance to lay down an 8-in. diameter pipe in order to supply two 4-in. branches.\*

#### AN ARCHEOLOGICAL TRAVELLER OF THE SEVENTEENTH CENTURY.

IN the announcement of the forthcoming sale of the second portion of the Sunderland Library (once but known to a few, and now so famous), more than one of our readers will doubtless have noticed the statement that the new catalogue is to commence with "Chardin." Chardin's is a name which is worthy of attention. Sir John Chardin was not only an ardent, and what is more remarkable for the century in which he lived,—a trustworthy traveller, but he was one of the early Fellows of the Royal Society, among the oldest transactions of which, his papers will be found. He was the intimate friend of John Evelyn, in whose delightful "Diary" will be found more than one notice of the French Huguenot traveller who, driven from his native country, found on our shores the welcome denied him at home. In one of these notices Evelyn refers not only to Sir John Chardin's visit to the ruins of Persepolis, but to Nineveh. Archeologically, Chardin's testimony is most interesting as being perhaps the earliest notice by a modern traveller of the existence of the buried treasures, the discovery of which was to give such a fame to Botta and to Layard, and reveal to us such a store of unsuspected information on the history and art of the distant past.

The extract is from Evelyn's "Diary," under date 1680, the year of Chardin's arrival in London:—"August 30 (1680). I went to visit a French gentleman, one Monsieur Chardine, who, having been thrice in the East Indies, Persia, and other remote countries, came hither in our return ships from those parts, and it being reported that he was a very curious and knowing man, I was desired by the [Royal] Society to salute him with his name, and to invite him to honour them with his company. Sir J. Hoskins and Sir Christopher Wren accompanied me. We found him at his lodgings, in his Eastern habit, a very handsome person, extremely affable, a modest, well-bred man, not inclined to talk wonders. He spoke Latin, and understood Greek, Arabic, and Persian, from eleven years' travels in those parts, whither he went in search of jewels, and was become very rich. He seemed about thirty-six years of age.† After the usual civilities, we asked some account of the extraordinary things he must have seen in travelling over land to those places where few if any northern Europeans used to go, as the Black and Caspian Sea, Mingrelia, Bagdat, Nineveh, Persepolis, &c. He told us that the things most worthy of our sight would be the draughts he had caused to be made of some noble ruins, &c.; for that, besides his own little talent that way, he had carried two good painters with him, to draw landscapes, measure and design the remains of the palace which Alexander burnt in his frolic at Persepolis, with diverse temples, columns, relieves, and statues yet extant, which he affirmed to be sculpture far exceeding anything he had observed either at Rome, in Greece, or in any other part of the world where magnificence was in estimation. He said there was an inscription in letters not intelligible, though entire. He was sorry he could not gratify the curiosity of the Society at present, his things not yet being out of the ship, but would wait on them with them on his return from Paris, whither he was going the next day, but with intention to return suddenly, and stay longer here, the persecution in France not suffering Protestants,—and he was one,—to be quiet. He told us that Nineveh was a vast city, now all buried in her ruins, the inhabitants building on the subterranean vaults, which were, as appeared, the first stories of the old city; that there were frequently found huge vases of fine earth, columns, and other antiquities; that the straw which the Egyptians required of the Israelites was not to burn or cover the rows of bricks as we use, but being chopped small, to mingle with the clay, which, being dried in the sun (for they bake not in the furnace), would else cleave asunder; that in Persia, &c.; he spoke also of Japan and China, and of the many great errors of our late

\* To be continued.

† Evelyn's guess was very correct; Chardin was born in 1638.

geographers, as we suggested matter for discourse. We then took our leave."\*

Sir John Chardin, it will be seen, was a traveller out of the common. Born in 1643, the son of a Protestant jeweller, who lived in that classic corner of Paris (the island which once formed Lutetia, and on which is built Notre Dame), the Place Dauphine,—the Quai des Orfèvres is still occupied by goldsmiths,—Sir John Chardin early travelled in the East in pursuit of his father's business. The intolérant Louis XIV. and the repeal of the Edict of Nantes kept Chardin from his native country, and drove him to our shores, where he was received with open arms, ten days after arriving being knighted by Charles II., and appointed to the lucrative post of court jeweller; but to the scientific and literary students who formed in his early years the Royal Society, the distinguished traveller was particularly welcome, and he was, as we see by Evelyn's "Diary," almost immediately elected a Fellow. There is little more to be told of the traveller's busy life; he published, in 1686, an account in English of his journey to Persia, followed at later intervals by other volumes of his travels which will be found in most libraries, having been often re-published in various forms. For many years he was agent of the East India Company at the Hague and Amsterdam, the same admirable company of which he speaks so warmly in the preface to his *Travels in Persia*.†

During his latter years, Chardin resided at the then retired and completely isolated London suburb of Turnham Green, where, in 1713, he died, the Chiswick registers noting his death and burial. Visitors to Westminster Abbey will, however, recall the tablet, with its characteristic motto, to the memory of Chardin,—"*Sir John Chardin. Nomen sibi fletu sundo.*" The *Encyclopædia Britannica* declares that Chardin was buried in the Abbey; but what about the Chiswick registers?‡

#### NOTES FROM THE WEST.

SEVERAL important new buildings have been recently completed in the West of England, and a number of others are already in progress or under consideration.

The new grammar school at Crewkerne has just been opened. The school was founded as long ago as 1409 by John de Combe, a prebend of Exeter Cathedral, who endowed it with houses and lands. It has an income of about 700*l.* annually. The new building has been talked about for years, and designs were furnished by Messrs. Giles & Gough, of 28, Craven-street, Strand, London, from which Mr. Trevena, of Plymouth, has erected the school which has now been completed. The structure is principally of Crewkerne stone, but Ham-hill stone has been used on the ground level, and for the dressings, mouldings, &c. It is in plain Domestic style of the fifteenth century, and consists of basement, ground, first, and second floors, and a third floor in the centre tower. The large schoolroom is 60 ft. long by 24 ft. wide, and in it memorials to the founder and to the late head master (Rev. Dr. Penny) will be fixed. The first and second floors contain dormitories and especial provision

\* Further references to Sir John Chardin will be found noticed in Evelyn's "Diary," under the dates Dec. 27, 1680; Feb. 23, 1681,—this latter mentioning Chardin's "History of that wonderful Persian monument near Persepolis, and other rare antiquities which he had caused to be drawn from the originals."—July 18, 1683; May 2, 1687; Oct. 6, 1688; Evelyn's "Glossary to Sir John Chardin's son," the Earl of Bath and the Countess of Carlisle the other sponsors.

† Chardin, referring to the English trade at Smyrna, speaks of it (1686) as "driven by a Royal Company, which Company, by a most prudent manner, and therefore cannot fail of success. It has stood almost three hundred years." He speaks of it as doing business to above half a million annually. It is worthy of remark, in connexion with Chardin's mention of Nineveh, that it was one of the East India Company's servants, Mr. Rich, who may be said to have been the first to make careful excavations at Nineveh. The earliest plans of Nineveh were also prepared by another servant of the East India Company, Capt. Felix Jones.

‡ With reference to the Sunderland Library we may quote once more our old friend Evelyn, under date April, 1680:—"Lord Spencer purchased an incomparable library . . . wherein, among other rare books, were several that were printed at the first invention of that wonderful art, as particularly 'Tully's Offices,' &c. There was a Homer and a Suidas in a very good Greek character and good paper, almost as ancient. This gentleman is a very fine scholar, whom from a child I have known." This was the origin of the famous Blenheim Library. Among Evelyn's "Correspondence" will also be found a letter to "My Lord Spencer," referring to the recently-purchased library, which, "by the catalogue I have seen, must needs be a very chosen collection." This letter, however, bears the date 1693, although is described in the "Diary," August, 1689.



for any cases of sickness, which can be shut off from the rest of the building. Hot and cold water is supplied to all parts of the premises, and an underground reservoir has been constructed to hold 12,000 gallons of rain-water for laundry and other purposes. Provision has been made for heating with hot water, but all the rooms are supplied with open fireplaces. The walls internally have been plastered, and pitch-pine is used for the woodwork. A house for the master adjoins the school. The new building is situated on an elevated site, and capital views can be obtained from it of the surrounding country.

The promoters of the Taunton street-tramway have, it is said, resolved to abandon their undertaking, not being satisfied with conditions imposed on them by the town council.

A great deal of discussion has taken place in various parts of Wales as to the proposed University College. A commission from Cardiff visited the new and only partially completed Bristol University College to obtain information on the subject, and have since decided to raise a fund of 50,000*l.* towards a new building in their own locality.

The annual general meeting of the members of South Wales Institute of Engineers was held a week or two ago at Cardiff under the presidency of Mr. MacMurtrie. A rather suggestive fact was that not less than three out of the five papers read at the meeting dealt with electricity, the connexion between atmospheric electricity and colliery explosions, and the application of electric lighting to mines, being amongst the subjects considered. The members afterwards dined together.

Shortwood Chapel, Stroud, which has been rebuilt on a more convenient site, has recently been opened.

A new bank has been opened at Cheltenham. It was built by Messrs. Collins & Co., of Tewkesbury, from the designs of Mr. Knight, of Cheltenham, for the Worcestershire Banking Company.

A handsome reredos has been presented to Winchcombe Parish Church. It was designed by Mr. J. D. Wyatt, of London, and executed by Mr. T. Collins, of Tewkesbury.

A pastoral letter of the Bishop of Gloucester and Bristol shows that the Diocesan Association has contributed 645*l.* towards the restoration of sixteen churches; the total cost of the work is estimated at 15,730*l.* The sum of 4,493*l.* is being expended on seven schools, and 7,150*l.* in the improvement of seven glebe houses. To each of these objects the Association had also contributed.

The Penarth Dock Extension is being vigorously proceeded with. A large number of men are engaged in cutting away a portion of Penarth-hill so as to increase the dock area. The work will probably occupy about two years.

The new pier at Newton Noyse, Milford Haven, which has been for some time in process of construction, has been completed, and formally opened. The pier is 700 ft. long, is of iron, and the largest steamers can land passengers at it at any time of the tide. The pier is connected with the railway.

Twenty tenders were received for the building of the new Infirmary at Cardiff; and that of Messrs. Clark & Burton, of Cardiff, for 22,978*l.* was accepted. The building is to be completed in twenty months.

For some years a temporary wooden building has been used as a mission-room in Newfound-land-road, the centre of a populous district and one of the poorest parts of Bristol. An effort has been made to procure the erection of a permanent church and schools, and the latter have just been commenced. The building will consist of a large room, 70 ft. by 30 ft., to be used for Sunday-schools, lectures, temperance and other meetings, as well as for religious services, classrooms, soup-kitchen, and working men's club-room. The cost will amount to 1,800*l.*, of which the building contract is for 1,517*l.*

**Stains for Wood.**—The Adelaide Gold Medal has been awarded to Mr. Stephens for superior excellence in manufacture of stains for wood. This makes the eleventh highest international award received by Mr. Stephens for his stains. The quality of his manufactures is sufficiently attested, and too long known to our readers, to need commenting upon in these columns.

#### THE SANITARY ASSURANCE ASSOCIATION.

The first annual meeting of this Association was held at the Offices, Argyll-place, Regent-street, on Wednesday last. Professor Hayter Lewis, Vice-President of the Institute of British Architects, presided.

The secretary, Mr. Joseph Hadley, read the annual report, from which it appeared that the Association commenced the inspection of houses, supervision of sanitary work, and issue of plans and certificates as to the sanitary condition of houses in April last year, and that the houses inspected have varied in rateable value from 36*l.* to 750*l.* The work of the year had involved an expenditure of 365*l.*, including outstanding liabilities, and the balance in hand at the close of 1881 was 21*l.* 6*s.* 11*d.*

Professor Hayter Lewis, in proposing the adoption of the report and balance-sheet, referred to the great public importance of the work the Association had initiated in the metropolis. Other associations had been previously formed in the provinces, and recently one or two similar organisations had been set on foot in London, and it was to be hoped that the community generally would take advantage of the opportunities thus afforded them of obtaining skilled advice as to the sanitary conditions under which they lived. There was, however, a great deal of work to be done before the public would fully appreciate the necessity for sanitary inspections.

Mr. H. Rutherford, in seconding the adoption of the report, said that the extension of the business of the Association would depend on the growth in the public mind of the necessity for such sanitary arrangements, and every house dealt with would be a centre for extending the undoubted benefits of sanitary inspection.

Professor de Chaumont, F.R.S., of the Army Medical School, Netley, spoke encouragingly of the work of the Association. He thought the result of their first year's operations was such as to augur well for its future.

Mr. T. Roger Smith, Professor of Architecture, also spoke to the report, and said that, sooner or later, the Association must become a great influence for good. He himself could testify to the thoroughness with which the officers of the Association (Professor Corfield and Mr. Mark H. Judge) did their work.

The report and balance-sheet were then unanimously passed, as was also a resolution requesting the members generally to aid in making more widely known the objects of the Association.

The retiring members of the council were re-elected, and Mr. R. G. M. Creasey was appointed auditor.

#### THE FALL OF A STAGING IN OXFORD-STREET.

On Tuesday Dr. Danford Thomas held an adjourned inquest at Middlesex Hospital on the body of George Carter, nineteen years old, a carpenter, who resided at Manorville-road, St. John's-road, Upper Holloway. The deceased was working on Friday, the 10th inst., beneath a staging erected at the corner of Thomas and Oxford streets, when the staging, upon which were bricks weighing eight tons, according to one witness, and fifteen according to another, gave way. The deceased was buried under the bricks, and when extricated, was found to be dead.

Mr. James Edmeston deposed that two of the timbers of the staging were broken, and they were defective in quality. He estimated that 7,000 bricks, weighing 15 tons, were deposited on the staging. The accident resulted from an error of judgment in overloading the staging. The defective, weak quality of the timber could not have been readily perceived.

Mr. Poncione, solicitor, who appeared for the relatives of the deceased, stated that Mr. Hollis, the building owner, had satisfactorily compensated them.

The Coroner: Thus virtually admitting there was an error of judgment.

The jury returned the following verdict:—"That deceased was killed by the falling of the scaffold, on account of its being too heavily laden with bricks, and the timber thereof being in parts defective. The jurors had further to express their regret that the foreman of works had not stopped the loading of the stage with bricks when he first found it bulging beneath

their weight; and also that Messrs. Hollis, not being builders, should have carried out building operations under superintendence of a foreman of whose competency they were unable to judge."

Touching this matter, Mr. Riddell (the foreman) writes that he has had the bricks which were on the stage counted, and he wishes us to say that there were 3,314, instead of 7,000, as estimated by Mr. Edmeston.

#### COMPETITIONS.

**New Wesleyan Chapel and Minister's Residence at Clevedon, Somerset.**—Designs in competition have been submitted to the committee for the erection of a new chapel and minister's residence. Those under motto "Nota Bene" have been accepted; the author of the accepted designs being Mr. Herbert J. Jones, architect, Wellington Chambers, Bridge-street, Bristol. The other competitors were Mr. R. Curwen, of London, and Mr. A. Lander, of Barnstaple.

**Gas Offices, Cheltenham.**—The Directors of the Cheltenham Gas Company, at a late meeting, unanimously accepted the designs submitted by Mr. Alfred Smith, Mitcheldean, Gloucestershire, for their new central offices, with residence, to be erected in North-street, Cheltenham (which has recently been widened and very greatly improved by the corporation), and have commissioned the architect to secure tenders for the erection of the buildings forthwith.

**Yardley Cemetery.**—The Yardley Burial Board, having purchased land lying between Yardley and Acook's-green, near Birmingham, purpose forming a cemetery for the united district, and have adopted the designs of Mr. Alfred Smith, architect, Mitcheldean, Gloucestershire, for the chapel, lodge, entrance-gates, boundary walls, and laying-out and planting grounds. Tenders will be invited at once for executing the various works under the superintendence of the architect.

#### WIND PRESSURE.

At a meeting of the Meteorological Society, held on Wednesday, the 15th inst., at the Institution of Civil Engineers, 25, Great George-street, Mr. J. K. Laughton, M.A., president, in the chair, a paper was read "On the Distribution of Pressure upon Flat Surfaces perpendicularly exposed to the Wind." By O. E. Barton, B.A., and R. H. Curtis, F.M.S. In the present state of aerodynamics it seems to be impossible to make an *a priori* investigation of the distribution of pressure on a surface exposed to the impact of fluid in motion without introducing such limitations as render the solution arrived at widely divergent from the results obtained by the experiments hitherto made. The authors therefore proposed to themselves to attack the problem from the experimental side only, by a method which, as far as they know, has not been applied in the case of air, viz., the application of Pilot's tube, suitably modified in form, to the simultaneous measurement of the pressures at the centre and at any ex-centrically situated point of a pressure-plate of known dimensions. The results of the preliminary experiments are given in the present paper.

#### ROYAL NAVAL ENGINEERS.

An effort is being made, and not before it was called for, to lessen the disabilities and grievances of the engineer officers of the navy. For years, successive Boards of Admiralty have promised that these grievances should be ameliorated. During the debate on the Navy Estimates last year, several members of Parliament urged upon the Committee the necessity of listening to the representations of these officers, and of granting their just and moderate requests. The Junior Lord and the Secretary of the Admiralty stated in reply that much had been done of late years for the engineer officers, and so endeavoured to stave off the impending demand on the Treasury as well as on the Admiralty. But a statement now published shows the incorrectness of this assertion, and that the engineer officers were really worse off in 1881 than they were in 1863, a statement which the Admiralty have not been able to refute. It is to be hoped their case will be taken in hand. Something, too, should be done to improve the position of the engine-room artificers and the stokers.



## CORK SCHOOL OF MUSIC.

So much is now being written and thought about musical education in this country, thanks, in a great degree, to efforts of members of the Royal Family, that many of our readers will be glad to hear that successful work is being done at the Cork School of Music. The third report, published last year, showed that the total number of students attending the school was 175, as compared with 192 during the previous session, but this trifling falling-off in numbers has not in any way interfered with the prosperity of the school, as is proved by the fact that in 1879-80, the sum received in class-fees was 487l. 6s. 10d., while in 1880-81 it amounted to 565l. 6s. 9d., showing an increase of 77l. 19s. 11d., which is entirely due to the students having attended more regularly, and undertaken a larger amount of work. The committee rightly point out that the earlier children obtain a knowledge of musical science the better, more especially boys, as they find it very difficult in maturer years to give the necessary time to master what could easily have been acquired in childhood.

## THE LATE MR. FRANCIS RUDDLE.

We have to record the death of Mr. Francis Ruddle, of Peterborough, which took place on the 9th inst. The position which he occupied as a builder, but more especially as a carpenter and joiner, is worthy of notice. He was all his life employed in church and cathedral work in various parts of England, and he likewise excelled in the fitting up of high-class mansions.

His first work of importance dates about the year 1822, when he devised and executed a scheme for preventing, by the introduction of a large horizontal truss of oak, which still forms part of the structure, the further progress of a serious settlement which had occurred in the front of the cathedral at Peterborough, and which threatened its destruction. His father and he, about this time, re-roofed the building. The refitting of the choir of the cathedral, in 1828 to 1830, under the auspices of Dean Monk (afterwards Bishop of Gloucester) first brought him into public notice and into business connexion with Mr. Blore, who, during his long practice, constantly employed him. Sir G. G. Scott was one of the many other architects under whom he was engaged, and who had a high regard for him.

Among the more important of his works were the choir of Westminster Abbey; the Queen's private chapel at Windsor Castle, for which work Mr. Ruddle was complimented by the late Prince Consort; the fittings of the British Embassy at Constantinople; of one of the sultan's palaces, and of the house of the grand vizier; St. George's Church, Doncaster; Ripon and Hereford cathedrals; Wellington College chapel; Kilham Hall, Nottinghamshire; Trinity Church, Coventry; Canford Manor House, Dorset; Lutimere House, Bucks; Battlesden House, Beds.; and Battle Abbey, Sussex.

It may be worth recording that when Mr. Ruddle undertook his first work of church restoration, the art of Gothic carving had been long dead. He procured casts of old work, and taught his workmen from these examples.

He was born at Peterborough in 1798, and was, therefore, in his eighty-fourth year. He retained his faculties almost to the last, advising in matters of business until nearly the close of last year.

Many of his former workmen were trained solely by him, and remained during their lives in his employ, some for upwards of fifty years. He will be long and deservedly remembered as an example of thoroughness in work. Sir G. G. Scott wrote of him that "he was one of the best builders, especially one of the very best carpenters and joiners, in England."

For very many years he worked in conjunction with Mr. Thompson, the present Mayor of Peterborough, who now carries on the business. His funeral was attended by his three sons, two of his grandsons, Mr. Thompson, and about 120 of the employés.

## Birmingham Architectural Association.

An ordinary meeting was held on Tuesday evening, the 14th inst., at the rooms of the Association, Queen's College. After the business, a paper was read by Mr. T. W. Camm on the "Study of Decoration."

## INDUSTRIAL AND SANITARY EXHIBITION AT SUNDERLAND.

On Saturday last the Mayor of Sunderland (Mr. Wm. Wilson) formally opened, in the presence of a large assemblage, an exhibition of industrial, domestic, scientific, and sanitary appliances, promoted chiefly through the instrumentality of Mr. Councillor Rudland, as the result of a visit paid by that gentleman to the exhibition at Brighton. The proposal to hold the Sunderland exhibition was warmly encouraged by the local members of Parliament, and a number of gentlemen had been induced to act in the capacity of judges in awarding gold, bronze and silver medals, and certificates, to the successful competitors. The exhibition, which is held in the Skating Rink, Hudson-road, will remain open during the current week, and has already been largely attended. The exhibits are of a very varied and miscellaneous character. Much prominence is given to the subject of domestic lighting, heating, and sanitation, the catalogue being prefaced by a paper on "Domestic Sanitation," by E. Gregson Banner, C.E. In the exhibition are to be found models illustrative of advanced systems of sanitation. In addition to the exhibits of Messrs. Banner, sanitary appliances are shown by "The Antiseptic Apparatus Manufacturing Company"; Mr. A. A. Rickaby, engineer, Monkwearmouth; W. Harriman & Co., Blyden-on-Tyne; and others. With regard to lighting apparatus, it would seem as though the inventors and manufacturers represented at the exhibition are determined, if possible, to outshine the electric light. The Sunderland Gas Company, for instance, have suspended in the centre of the building a 1,000 candle-burner—F. Siemens's Regenerator Patent,—three 350, and two 250 candle-burners of a like description, and the Albo-carbon light are also shown by Mr. Geo. Hudson. Several descriptions of gas engines are also on view. The Patent Imperial Window Company, and Mr. R. Adams, patentee of the Anti-accident Reversible and Sliding Window, are also represented. Among the miscellaneous exhibits may be mentioned the artistic wall-papers of Messrs. Wm. Woollams & Co., 110, High-street, near Manchester-square, London. The Art-tile, China, and Glass Painting Company, 81, Finsbury-pavement, and Messrs. Craven, Dunhill, & Co., Ironbridge, Shropshire, show some pleasing specimens of their work. A number of oil-paintings also adorn the walls, but the exhibition is not strong in the artistic element.

## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

646. H. H. Lake, London. Composition for the protection of wood, &c., from fire. (Com. by J. Wildi, Sahr, Switzerland, and J. Schambeck, Munich.) Feb. 10, 1882.  
647. O. Slagg, Leeds. Preventing the fouling of oil-pipes of water-closets, &c. Feb. 10, 1882.  
652. J. Stainer, Hackmondwike. Apparatus for lifting stones, bricks, &c., on to scaffolding. Feb. 10, 1882.  
654. T. Fraser, Aberdeen. Linings for vent flues and chimneys. Feb. 10, 1882.  
658. A. McLean, London. Slabs or panels for decorative purposes. Feb. 10, 1882.  
663. J. F. Williams, Liverpool. Sliding windows. Feb. 11, 1882.  
666. H. J. Haddon, Kensington. Treatment of clay for the manufacture of bricks, tiles, &c. (Com. by F. Cancon, Roanne, France.) Feb. 11, 1882.  
681. J. W. Pitt, Loversedge. Hinges for doors. Feb. 11, 1882.  
715. R. M. Chevalier, London. Venetian blinds. Feb. 14, 1882.  
720. C. D. Abel, London. Ovens. (Com. by W. Loreng, Vienna.) Feb. 14, 1882.  
746. T. F. Wintour, London. Ventilating apparatus. Feb. 16, 1882.  
755. E. Weaver, London. Water-closets. Feb. 16, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named.

Feb. 14, 1882.

4,393. C. Shields, Manchester. Safety-valves for domestic boilers and hot-water apparatus. Oct. 10, 1881.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

4,425. T. Stokoe, Headingley. Apparatus for warming rooms, greenhouses, &c. Oct. 11, 1881.

4,555. W. M. Farley & J. H. Bond, Torquay. Apparatus for supplying dwelling-houses with water. Oct. 19, 1881.

5,315. W. Clark, London. Fixing window-glass. (Com. by T. Tanner, Otage, U.S.A.) Dec. 5, 1881.

Feb. 17, 1882.

4,423. W. A. Barlow, London. Slates. (Com. by T. Finger, Coblenz, Germany.) Oct. 11, 1881.

4,557. J. A. Hornby, Menai Bridge. Water-closets. Oct. 19, 1881.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending February 18, 1882.  
1,031. G. Price, Birmingham. Attaching door or other knobs of handles to their spindles.

On the inside of the neck of the knob is formed a toothed rack. On one side of the spindle is a trough in which is secured a spring, which has a tooth on its free end, which engages in the toothed rack. March 10, 1881. Price 6d.

1,050. W. B. Bryan, Blackburn. Water-closets, &c.

The slop and waste water is intercepted and used for flushing the water-closets. (Protection not allowed.) March 11, 1881. Price 2d.

2,082. H. E. Cooper, London. Syphonic apparatus for flushing.

The siphon is brought into action by the pull of a lever. (Protection not allowed.) May 12, 1881. Price 2d.

2,228. S. & J. V. Day, Glasgow. Harbour and dock works.

The foundations are formed of concrete, which is placed in a pressure in order to preserve the shape of the blocks. (Protection not allowed.) May 21, 1881. Price 2d.

2,845. T. Drake, Huddersfield. Apparatus for heating and boiling water.

In a cylindrical casing are placed coils of pipes which are coiled round two vertical tubes within which are the burners for the gas. June 29, 1881. Price 6d.

## MARBLE DECORATION.

A NEW and interesting process of decoration has just been carried out successfully by Messrs. Keith & Co., from designs by Mr. William White, F.S.A., in the recesses of the new Church of St. Michael's, Battersea. The panels are of white marble inlaid with colours of permanent enamel paint. The pattern is laid on the marble, either transferred from the drawing, or painted in by the artist's own hand. Some ingenious manipulations then leave the painted parts of the marble forming the design to be bitten away to a clean delicate outline. The parts thus incised are then filled up with the enamel, or, as in the present case, merely painted in, by which means the soft richness of the relieved surface is obtained, in addition to the colour. In these panels the body ground of the figures is left in white marble, the lining out of the features and draperies being in various suitable colours. It will be seen from this description that genuine character or great fidelity to an original may be obtained in a most durable manner. Messrs. Keith have produced from the architect's drawing at a small cost (35l.) figure subjects, with a diaper background on three panels. On either side of a large central cross are St. Mary and St. Joseph of Arimathea, St. John and St. Mary Magdalene, and two angels, rose and lily and other flowers. On a somewhat small scale, and with insufficient surroundings, much of the effect is lost from a distance. But it will bear close inspection, and the invention will prove valuable.

## CUSTOM HOUSE AND WOOL QUAY.

RIVERSIDE improvements are being constantly made, and we have to note the erection here of a massive wall for the Fishmongers' Company, from designs of their architect, Mr. Thos. Chatfield Clarke. The structure has been carried out considerably in advance of the old river frontage of the quay, and a large additional area of landing space is thus secured. A feature in the construction, in order to render the work impervious to wet, is the introduction of a perpendicular central damp course, consisting of a course of bricks embedded in asphalt, and perfectly bonded into the wall.

The works have been executed by Messrs. Lucas & Aird, under the superintendence of Mr. Walter B. Mitchell as clerk of works for the Company. The damp course has been laid by Messrs. Turner and Burch (the Granite Rock and Seysel Asphalt Company).



## COMPETITION FOR SCULPTURE.

ST. GEORGE'S HALL, LIVERPOOL.

SIR,—I have not often met with a more perverse misrepresentation of facts than appears in a letter in your last number, signed "Drill," referring to competitive designs for sculptured panels at the above-mentioned building. This is the more inexcusable as, when penning his letter, the writer must have had staring him in the face, on the front page of the *Builder*, the advertisement containing the true state of the case. He says, "artists are invited to compete and to send in twenty-eight designs, half-size, that is to say, from 2 ft. 2 in. to 2 ft. 9 in. square, which would require, to do them roughly, at least six months," and be worth at least 500*l.* or 600*l.*, &c. Now, what are the facts? There are not twenty-eight "designs" required. There are twenty-eight panels, but only seven "designs" wanted, these designs being repeated.\* They are not required to be half-size, but only one-quarter. What have to be sent in are seven sketches in outline or monochrome, varying from 1 ft. 1 in. to 1 ft. 6 in. square. For these a first premium of 200*l.*, a second of 100*l.*, and a third of 50*l.*, were offered.

If "Drill" values his talent and skill so highly as 500*l.* or 600*l.* for these, he had better not compete. It is not expected that either Millais or Leighton will come into the arena. He proceeds,—"There is not the slightest guarantee that the successful artist's work shall be carried out; or, if carried out, that he himself shall execute them." There are many artists capable of making a beautiful design who are not sculptors. The fine group in the tympanum of this very building was designed by Professor Cook-orell, but certainly not sculptured by him. It was for the purpose of giving an opportunity to artists in general that this arrangement was made. Should the successful design proceed from a sculptor, no doubt he will be employed.

The oddest complaint, however, remains. "Nay," says he, "there is not even the promise that the works premiated shall even remain the property of the artist." I wonder what he supposes the premiums are offered for. If the artist is to pocket the reward and walk away with the designs, what is left to the corporation of the city? They are not gallery-pictures which are wanted, but working drawings, which will be of no value when the work is executed.

The intentions of the committee are honest and fair, and I think liberal. J. A. P.

## PUBLIC RECORD OFFICE.

SIR,—My attention having been called to the correspondence now going on between the readers at the Public Record Office, Fetter-lane, and the editors of the principal London newspapers, and especially to a letter which appeared in the *Builder* of February 11th, appealing to her Majesty's Government for some artificial light in the public reading-room of the Record Office on foggy and dark days, will you kindly permit me to say a word or two upon the subject?

I must acknowledge to be somewhat surprised that such a simple matter should be allowed to cause so much ill-feeling, and it is certainly very much to be regretted that for the sake of a few shillings the Record Office authorities appear to be so desirous of increasing the violence of a storm which is surely becoming every day stronger and more dangerous. Every person must feel deeply indebted to the Government for throwing open the public records to the literary student, and I am one of the very last persons that would wish to do anything likely to injure them. In fact, I have been the means upon more than one occasion of rescuing important historical documents from destruction; but it does appear to me to be a very curious fact that for the cost, as your correspondent "Recorder" puts it, of a few yards of pipe and one or two burners, these records are useless to the historian during many days in a year.

Twelve years ago the very same annoyance occurred to me that has occurred to dozens of readers during the past month. I was engaged in transcribing a very important document one morning in that same round fireproof room now so soon likely to be a by-word over the world,—at times the darkest, and certainly the most draughty room ever erected for the public convenience,—when, lo and behold, a dense "pea-

soup" fog came over Fetter-lane. Not a light was to be permitted to enable me to continue my transcribing, and after stopping an hour with a view to test the continuance of the fog, I was compelled to quit the building that day for good, and return home, a distance of several miles, and back again the next day to finish my transcript, which I would have completed with a gas-jet above me in half an hour the day before. And yet during the twelve long years since then the Government are still in the same position, and the reader is no better off than I was then.

The argument which has been advanced by the Deputy Keeper,—that the introduction of a light will endanger the records,—is, I must say, a very remarkable one, and it will be interesting to know upon what grounds he bases the opinion. As I can boast of being the historian of the district, I have made every inquiry possible, and have consulted the structural details of the building, and I must say I am met on all sides by the direct opposite opinion to that expressed by the Deputy Keeper. For, as your correspondent very justly say, the gas is already in the building, and the room is called by the officers of the Fire Department fireproof. I am, therefore, bound to tell my troubles of twelve years ago, and add my sincere wishes for the speedy removal of a most vexatious and yet easily adjusted grievance.

Time was when the British Museum Reading-room was in the same position as the Public Record Office Search-room is now. Thanks, however, to the enlightened management of Mr. Boud, the respected Librarian,—and I give him, in sincerity, my humble thanks in the above expressive word,—the Museum readers have not now to bundle pell-mell out when darkness sets in, but can pursue their studies with the greatest comfort and convenience. We can recollect the time, only a few years since, when the idea of lighting up the reading-room was enough to make the two last librarians believe that Fenians of the deepest dye wanted to blow up the building. And a few years hence we shall have our laugh over the past vagaries at the Public Record Office, and rightly wonder that for so many years the public were so much inconvenienced, while every other public building in London studied the interests of the public as well as the interests of even those obliging officials of whom I cannot speak in too much praise. T. C. NOBLE.

## ROOF COVERINGS FOR CATTLE SHEDS.

SIR,—In reply to correspondent "Ionomy," I have lately had to consider the same question. The difference in cost between roofs of small span of slate and galvanised iron is so slight that it is not worth considering. Slate is decidedly the best.

For large spans, galvanised iron is cheapest, and costs less for framing and piers. 60 ft. or 60 ft. span can be covered without intermediate columns. No. 18 gauge,—280 lb. to cover a square for a lasting roof. No. 22 gauge,—185 lb. to a square for a cheap roof. For No. 18 gauge, purlins can be 6 ft. to 8 ft. apart.

If the roof should oxidise, paint with anti-corrosion or peroxide of iron paint. Roof stripping must be prevented by louvred openings in the sides, or lanterns, dormers, or other openings.

I do not think exhalation will have much effect. The life of the roof will depend on the quality of the sheets and the coating of spelter or zinc given the sheets. I have a roof of twenty-three gauge (about thirty squares) that has been in existence for twenty-two years, and is a good roof now, but it is coated every four years with Carson's anti-corrosion paint, and I am glad to say that I have never found rust form where this is used.

If cost is no object, use V. M. zinc, Italian corrugation, but in all cases slate is preferable for small spans, as it is suitable for buildings of a permanent character. ROBERT PHILLIPS.

SIR,—I believe a circular girder felt roof, erected on the double bow and string principle, would suit the requirements of "Ionomy."

In the first instance, it is much cheaper and can be erected in shorter time than any other kind of roof. Secondly, if the girders are well secured to the walls, and the felt properly nailed to the boards, it will stand firm in all weathers without any danger of wind stripping. JOHN ROGERS.\*

\* Several other letters on the same subject have since reached us.

## SPECIFICATIONS.

SIR,—Mr. Ewan Christian's address,—ostensibly to young architects,—may be very well considered, and his advice adopted, by older practitioners. In some of his remarks there is much to interest others also,—notably, their servants, the clerks of works. As one of that ilk, it has been my fortune to meet with various kinds of specifications such as he describes, but I have also had to superintend the carrying out of large and costly public works where the specification was altogether absent, and this too under a F.R.I.B.A., who exactly answers Mr. Christian's description, one "who thinks his art so high that he cannot condescend to things so low, and so gave himself no trouble in the matter!" Of course there have been "heavy bills for extras, and much dissatisfaction," especially on my part, as I have had to ascertain the architect's wishes as well as I could, as we went along,—no easy matter with such a one, who did not know his own mind, involving many alterations. May I never be called upon to serve another of his kind!

A CLERK OF WORKS.

## MUNICH GLASS.

SIR,—I read with much interest in your issue of the 4th inst., the notice of the able paper read before the Society of Arts on "Stained Glass"; but having had some experience of Munich glass I cannot in justice let it pass without comment. The whole tone of the reader appears to me to be based on what was rather than on what is. The windows at St. Paul's, and at Glasgow and Cologne cathedrals are the examples so generally referred to, but they were executed between twenty and forty years ago. How do our windows of that period look? They must certainly be pronounced inferior to the Munich ones, and will not bear comparison with the best old specimens, like those the lecturer compared with the new windows at Cologne. Vast strides have, however, been made during these last twenty years in this country; Munich has by no means remained behind, but has made a most marked improvement, especially in the better understanding of glass and its technical treatment. At the present time the successors of the establishment of the venerable defunct King Ludwig, by still possessing men who are in every sense of the word true artists, and at the same time by working on the right principles applicable to glass, produce now windows which will compare favourably with most of our own countrymen's specimens. While admitting all that the speaker says in favour of English stained glass, every one who has taken the trouble to look must say that a Munich window of to-day is no more like one of the period referred to in the lecture than an English window in 1832 is like one of twenty or thirty years ago. ANOTHER F.S.A.

## PLUMBERS' WAYS AND THE COST OF PLUMBING.

SIR,—Last week I had something out of the common to do with plumbers, and think that the following should be brought to the notice of your readers.

Four men, two plumbers and two labourers, were engaged to do certain plumbers' work direct under my supervision. I was very particular, so I wished to have first-class London plumbers, as the job had been done before, and was a failure. I received testimonials stating that the plumbers were efficient and to be relied upon. We commenced work, and the following is the style in which these plumbers went about the job. The first thing that they commenced with was the fixing of the 4-in. lead soil-pipes, with the D-trap for the closets. The pipe was straight, and without a bend. It did not require scaffolding, but was what the general foreman calls an easy job. Time fixing 18 ft. of 4-in. lead soil-pipe and two traps for the ground and first floor closets, two plumbers four days each, also two labourers four days each. Plumbers' money and their country money amounted to 3*l.* 8*s.* The labourers' money and their country money amounted to 2*l.* 6*s.*; total, 5*l.* 14*s.* This amount of work should not have cost for labour more than 1*l.* 5*s.* according to any price list.

But can this be wondered at, when I give you an outline of their style of work, which I have taken with great precision? The fixing of the trap and soil-pipe from first to second floor was done as follows:—The end of the third length of soil-pipe was beaten in to allow it to enter the one fixed. This was done in the shop. It was then taken and put into its place; then taken down, and the end of the pipe blacked over; this was allowed to dry, then the pipe again put into its place, the joint scribed for the distance to solder; taken down again into the shop, where the end of the pipe was shaved, then tinned,—that is, the end was rubbed round with solder, and all wiped off again. This pipe was then again taken up, and again put into its place. This is what these skilled workmen call offering it up to mark for the hole wherein the

\* This is not suggested in the advertisement.—ED.



branch from the trap enters. This done, the pipe was again taken down into the shop, and a hole cut for the branch. This was one day's work. Next day the pipe was again taken out of the shop to its place, and again offered up. The next job was to fix the trap, and to put on 2 ft. of 4 in. pipe for the branch. This was, after twenty-three different times taking out and refixing, finally settled that it would do. Then about 28 lb. of red-hot solder was brought to the scene, and the trap tacked to the branch pipe, and also this branch pipe tacked to the soil-pipe; after which the lot was again taken into the shop, and the two joints were made, also some tuck soldered on. This completed another day. The next day the trap and pipe were taken to their resting-place without any offering up, and finished. I then asked these men whether this was the usual style of doing plumbing work. They told me they never adopted any other method; they had learned their trade in London, and had always given satisfaction.

Now, sir, I think that the plumber should be taught to work by lines like a carpenter or mason; this would save all this lifting up and down, and bring the price of plumbers' work a little nearer the mark. Some plumbers manage to work to a price-list, and why not all? There certainly must be a better mode of work than that which these two plumbers had, and I see no valid reason why some of your able geometricals cannot set to work and write a few lines and give drawings to set the plumber right.

Lately I have read many things about plumbing in different journals, some of which are extremely useful and interesting, but not one has yet shown the plumber how to fix by lines a closet-trap.

W. T., Architect.

#### DRAPERS v. BUILDERS AND DECORATORS.

SIR,—As every week now we see fresh firms of drapers advertising themselves as builders and decorators, it would be as well that the public should know the system on which most of these firms work. Having no plant, and often no person who can understand anything of the work whatever, they have to let it to some one who does understand it, and who has plant; of course, taking care not to forget themselves in the transaction. I know of a large job now at the West End that is let to a firm who, in their turn, have sub-let the greater part to another firm, although the first firm have their name painted on the steps in glaring colours, not one pair of which belongs to them, and which, if washed, would probably reveal the name of the firm who are really doing the work; and this letting and sub-letting, I am sorry to say, is more the rule than the exception. This is well known in the trade; but I think if the public knew it, they would be the best judges as to whether this new system of employing drapers, or the old,—that of going direct to the tradesman who does the work,—is the best.

FULL WAGES.

#### WOOD PAVING.

SIR,—The remarks of Mr. Rawlinson, in your issue of the 4th inst., on the subject of wood-paving, this day been reproduced in the *Eastern Daily Press*, and have caused some considerable excitement amongst the ratepayers of this city (Norwich), who are now spending (under the sanction of the Local Government Board) 25,000l. in wood-paving.

Will you allow me to ask Mr. Rawlinson, through the medium of your paper, where wood-paving has been laid by a competent tradesman on sand in London or elsewhere and failed to give satisfaction? I may mention that I have carried out a considerable quantity of this class of work, without concrete, in London and other places, amongst which I may state that I have laid about 50,000 yards super. in this city during the past nine months, and, without endeavouring to take any credit to myself for the way in which the work has been executed, I venture to say that wood-paving laid on a good gravel (or coarse sand) foundation, thoroughly rammed and well grouted, will not only be found to be as pleasant to drive over, but equally (if not more) durable than that laid on concrete. The total cost of the Norwich work per yard does not exceed 7s.

JACOB P. BATCH.

#### SCHOOL BUILDING NEWS.

*Sheffield (Cormwall).*—A small building for Sunday-school purposes has been erected in the hamlet of Sheffield, in the parish of Paul, Cornwall. The architect is Mr. J. S. Tregonza, and the contract was let to Mr. J. Tregonza, of Mousehole, and Mr. T. E. Wallis, of Sheffield. Much of the work, however, was done without pay. The farmers hauled the stone from the quarries near, the stonemasons worked the granite of which the front is built, whilst the carpenters put on the roof and made the forms. Under these circumstances a room, 36 ft. long, 19 ft. wide and 13 ft. high, has been provided for about 130l.

#### CHURCH-BUILDING NEWS.

*Stretton.*—On the 19th ult. the interesting Early English church of St. Nicholas, Stretton, Rutlandshire, was re-opened, after being thoroughly restored. The whole of the roofs are new. The early semicircular arcading has been rebuilt, using up all the old stones as far as practicable. The north aisle is enlarged, and the defective masonry throughout the church restored. The quaint old bell-turret was taken down some few years ago (being unsafe to stand). The stones were all carefully marked, and it has been built up again with the original masonry, and the two bells rehung. The best of the old bench-ends and the Stoken Hall pew have been preserved, and used in the transepts. The chancel fittings, with the pulpit, desk, lectern, &c., are of English oak, and of rich design. The carving of these, and the restoration of the pier-caps, &c., have been executed by Mr. Geo. Belton, of Belgrave. Four memorial stained-glass windows, by Messrs. Clayton & Bell, have been inserted (three in the chancel and one in the new window in the north aisle). The church is warmed by one of Porritt's underground stoves. The whole of the works have been carried out by Mr. Thos. O. Halliday, of Greetham, Oakham, under the superintendence of Mr. James Fowler, architect, Louth, Lincolnshire.

#### Books.

*Hopes and Fears for Art: Five Lectures delivered in Birmingham, London, and Nottingham; 1878-1881. By WILLIAM MORRIS. London: Ellis & White. 1882.*

THREE lectures on art are provided by a great deal of what is intended for, and in some cases may be called, very eloquent language of appeal and denunciation, characterised often by a lamentable want of practical sense and insight into the real conditions and difficulties of modern life. Mr. Morris is one of those enthusiasts who seem haunted by the idea of bringing back a golden age, and who seem to think that this can be done by wilfully ignoring the present facts of life and society, and by proposing to go back to a former condition of things, when the world was much less crowded, and all things could be done with greater leisure and consideration than is generally possible at present. The social problems of to-day are infinitely more complicated than in the times with which Mr. Morris is in love, and to ignore this fact is absurd. The author is eloquent against the effects of machinery and of the subdivision of labour in deadening the individual interest of the workman in his work and substituting mechanical for artistic production; and he talks as if this were a wilful crime against the people, which could be removed at the word of command. His political economy is the political economy of Ruskin; in other words, of what, in view of present facts, is an imaginary Utopia. If Mr. Morris could tell us how an enormously overcrowded society is to earn its living and find a market for its labour without the economy in production provided by machinery and subdivision of labour, we should have cause, indeed, to be thankful to him; but, so far from attempting to grapple with this problem, he hardly seems aware of its existence. He is indignant that London should have covered an immense tract of country with houses where there were formerly fields and villages. Unfortunately, human beings, like the lower animals, when congregated together, will increase and multiply. If Mr. Morris could have counteracted this tendency, we might have done without the crowds of houses, no doubt; or, perhaps, he would prefer that the people should live in burrows in the earth, like rabbits. We may remind him, however, that a great man who had no lack of sympathy with the beauties of nature—Dr. Arnold—saw in London "a sublimity beyond that of the sea or the mountains."

For modern scientific progress and study Mr. Morris seems to have the supremest contempt and indifference; but he can no more push them aside than push back the Atlantic with the traditional mop. The fact is that, so far from the present age being a hopeless and degraded one, as he would have us believe, it is an age of very great achievements, and will be regarded in the history of mankind as a very remarkable epoch. But the tendency of the strongest intellect of the day is towards science and not towards art, and no amount of lecturing

will alter the fact. It is very probable that the science of this generation is unconsciously laying the basis for the art of a future generation.

We dismiss the political economy side of the matter, therefore, on which it seems useless to argue with a writer who takes this tone, to glance at one or two of the suggestions more directly connected with the art and architecture of the moment. The central position of architecture among the decorative arts the author puts very decisively:—"They are all summed up in one word—architecture; they are all parts of that great whole, and the art of house-building begins it all. If we did not know how to dye or to weave; if we had neither gold, nor silver, nor silk, and no pigments to paint with, but half a dozen ochres and umbers, we might yet frame a worthy art that would lead to everything, if we had but timber, stone, and lime, and a few cutting tools to make these common things not only shelter us from wind and weather, but also express the thoughts and aspirations that stir in us." This is true so far; but the idea, expressed a page or two further on, that the greatest foe to art is luxury, is unsound. A great deal of the finest and richest decorative art of the world has been produced in periods of the greatest luxury, and has been called forth by the desire for luxurious surroundings and appointments.

The lecture entitled "Making the Best of it," contains a good deal of suggestion as to the means of making an ordinary unarchitectural house passable in its exterior and interior aspects. As to the outside, Mr. Morris confesses that there is not much to be done with it, though we can hardly concur in the remark that when a building is ugly in form it will bear no decoration. It is little use, certainly, to bring out its main lines in any marked way,—that is only to emphasise their ugliness; but surface decoration may, at least, give it one sort of beauty. We see this exemplified in many Japanese jars and other objects, the main forms of which are often bad, but which are admired, even by people who profess very fastidious taste, for their fine surface decoration. The suggestions for the treatment of the interior of rooms are nearly all good; and in this branch of art Mr. Morris is an approved master. In speaking, *en passant*, as to the designing of patterns, the author observes that it is clear that a recurring pattern must have a geometrical basis, "only the structure may be more or less masked, and some designers take a great deal of pains to do so." This seems an inadequate expression of the facts. A large proportion of the best surface ornament in existence arises in great measure from the masking or evading of what is in reality a very simple geometrical basis. This is especially the case in the many Saracenic patterns, which are simple enough when reduced to their elements, but have an appearance of great richness and complication owing to the artful management of the lines, so as to evade the expression of the real structure. Mr. Morris thinks this is not necessary or desirable in large and important patterns, and he has, if we remember rightly, illustrated this in some fine specimens of his own designing; but we still think the highest effect is gained when the composition is made to appear continuous. One most important point is emphasised:—"No amount of delicacy is too great in drawing the curves of a pattern; no amount of care in getting the leading lines right from the first can be thrown away, for beauty of detail cannot afterwards cure any shortcoming in this." Mr. Morris puts the reason for preferring comparatively small panes in a window to great plate-glass sashes, in a manner that many will sympathise with. We want a window, he says, to interpose something between us and the outer air, "to make us feel as if we were indoors on a cold day"; besides which, a large, bare window leaves a most awkward gap in the architectural design, where there is any, both of the interior and exterior. We once heard a significant comment on this point, from a practical man, with no theories about art of any kind, who had taken rooms in one of the large, plate-glass offices which are often built now. "I feel," he said, "as if I were sitting in the street."

Considering that Mr. Morris is prominently connected with the Society for the Protection of Ancient Buildings, we are certainly amused at the *naïveté* of his remark in regard to such buildings and restoration. "These old buildings," he says, "have been altered and added to century after century, often beautifully, always historically; their very value, a great part of it, lay in that." Just so. Each generation added



to them as its own needs and tastes inclined it. But if Mr. Morris's society had existed, and been able to carry out its principles all that time, all these alterations and additions would have been stopped.

*The Towers and Steeples designed by Sir Christopher Wren: a Descriptive, Historical, and Critical Essay.* By ANDREW T. TAYLOR, Architect. London: Batsford, 1881.

This is a sensible and pleasantly-written little book, and the views serve to show the variety that Wren's steeples display, but the sketches are so small and so slight that they can only be regarded as memoranda.

*Records of St. Michael's Parish Church, Bishop's Stortford.* Edited by J. L. GLASSCOCK, jun. London: Elliot Stock.

MR. GLASSCOCK has done a good work for Bishop's Stortford, and, so far as we can judge, has done it very well. He has not merely printed with care the churchwarden's accounts, inventories, and other parish papers, but has added a number of notes which show antiquarian and general knowledge. We remember one of his name who some years ago was a well-respected builder in Bishop's Stortford. It would be a good thing if Mr. Glasscock's example were followed in many other parishes.

### Miscellaneous.

**English and Foreign Artificers.**—According to the *Liverpool Journal of Commerce*, a compliment has been paid to English cabinet-makers in the inquiry opened by the Minister of Arts in France into the working of apprentice-schools. It was stated that in this branch of trade the night-schools established in Paris for geometrical drawings, &c., were mostly attended by German working-men, who in many cases were the sons of master cabinet-makers. Some of the employers complained of the lack of interest shown by French workmen, and in dwelling on the decreased exports in this branch said the tone was now set by English houses, and those of Paris were compelled to imitate the furniture sent over by their most formidable rivals in the Universal Exhibition. The decline in the trade has been so marked that very few apprenticeships are made in Paris, where the majority of those employed, numbering in all 12,000, belonged originally to the provinces. It was averred that out of this number not more than 300 could read a plan. One of the commissioners referred to the artistic work displayed at some of the carriage entrances of the leading residences in the capital. The president of the Syndical Chamber of Master Joiners replied, "At the most twelve workmen out of 12,000 are capable of turning out such *travaux de choix*." The question referred not to carved ornamentation, but simply to the construction of gates, with their complicated panel-work and mouldings. The upholsterers account for the intellectual inactivity apparent amongst their workmen by alleging the subdivision of labour, each having a given class of design to follow, and caring nothing for the various plans for their ensemble. Apprentice schools in this branch are urgently demanded. Wood-carvers and stone sculptors are represented as suffering from mental sloth.

**Steeple Jack.**—The top of the spire of St. Jude's Church, Kensal-green, London, showing signs of falling, Joseph Ball, of Tork Castle, Oldham, was called in, who at once took 4 ft. down from the top of the spire stonework. Below this was brickwork, which had also given way. Mr. Ball started by erecting his large ladders one on top of the other in a perpendicular line straight to the top of the spire, and then commenced to fix his staging just under the part requiring repair, which saved considerable time and expense of staging from bottom to top, and in a few days completed the work.

**Plumbing.**—Notwithstanding the exhibition of specimens of handicraft shown at the International Exhibition, each competitor for the prizes offered by the National Health Society will be required personally to exhibit his skill in plumbing at a competitive examination, which will be held on Tuesday, the 28th of February, and Wednesday, the 1st of March, in the Eastern Arcade, Horticultural Gardens, South Kensington. The judges will be Mr. George Shaw, Mr. W. Bassie, Mr. Ernest Turner, and Mr. C. Hudson.

**The Patrick Stead Hospital at Halesworth**, erected out of the money (£27,000), left for the purpose by Mr. Patrick Stead, a native of the town, is now nearly completed. The architect is Mr. Henry Hall, of Doughty-street, Mecklenburgh-square, whose designs were selected in open competition. The style is Elizabethan. The structure is of red brick, with dressings of Doulton stone. The high-pitched roofs are covered with mottled Broseley ribbed tiles, surmounted by ornamental ridges; and there is a piquant octagonal bell-turret. A striking feature in the main front is some excellent sculpture in busto-relievo in the central gable. This is in stone, half life-size, and represents our Lord healing the sick. This sculpture, as well as the rest of the carved work upon the building, is by Mr. Harry Hems. The floors throughout are of pitch-pine; the stoves are by Messrs. Barnard, Bishop, & Barnards, of Norwich; the mantelpieces are of pitch-pine, ornamented with painted Scriptural subject tiles. The operation-room is on the first floor. The general contractors were Messrs. Samuel Howard & Son, of London and Halesworth; the lead glazing is by Messrs. Moore, of London; the clerk of works was Mr. A. F. Scott. A view and plans of the building were published in vol. xxxix. of the *Builder*, pp. 531, 532.

**Glasgow Archaeological Society.**—On the 16th inst., at a meeting of this Society, Mr. D. Murray, F.S.A. Scot., read "A Note on Glasgow and other Provincial Coins and Tokens." Mr. W. G. Black, member of the British Archaeological Association, read a paper "On the Origin and Theory of Charms," after which there was exhibited an old jug of Prestonpans or Portobello stoneware, with a view of the Broomielaw; also a book entitled "The Former and Present State of Glasgow contrasted.—A Dream: Glasgow, 1787."

**The Forest of Dean U.D. School Board** have appointed Mr. William Jones, of Cinderford, Gloucestershire, clerk of the works for their new school building, now in course of erection at Lydbrook and Cinderford, Gloucestershire, from the designs and under the superintendence of Mr. Alfred Smith, architect, of Mitcheldean, Gloucestershire.

**The Building Committee of Yarmouth Town-hall**, which is to be opened in June next by H.R.H. the Prince of Wales, have accepted the contracts of Messrs. Norman & Son, Great Yarmouth, and Messrs. John Finch & Co., City-road, London, for furniture and fittings.

**Raglan Music Hall.**—The Building Act Committee of the Metropolitan Board at their last meeting instructed the Solicitor to proceed against the owner of the above hall for not carrying out the structural alterations certified by the Superintending Architect to be necessary for the protection of the public in case of fire.

**Mission House.**—The opening of a new Mission House took place on Saturday last at St. Stephen's, Smethwick. The furnishing throughout, including a silk-velvet altar frontal, was supplied by Messrs. Jones & Willis.

### TENDERS

For new roads and sewers on building estate, next to Castle-hill Station, Ealing, for Messrs. Johnston, Palmer, & Peiser. Mr. F. Beeston, surveyor:—

R. & G. Neal.....	£4,425 0 0
James Neal.....	4,314 0 0
E. Taylor.....	4,271 0 0
Nye.....	4,261 0 0
Rampton.....	4,246 0 0
T. L. Green.....	4,240 0 0
Nowell & Robson.....	4,168 0 0

For new roads tavern, Blagrove-street, Reading, for Mr. R. Oakshott, Messrs. Brown & Albury, architects:—  
Weaver, Reading (accepted).....£1,532 0 0

For new business premises, Friar-street, Reading, for Mr. J. Gregory, Messrs. Brown & Albury, architects:—  
Kingley, Banbury (accepted).....£2,950 0 0

For pulling down and rebuilding the "Ball's Head," Broad-street, for Mr. J. T. Beaton. Mr. Benjamin Tabberer, architect:—

Lea.....	£1,810 0 0
Dones.....	1,834 0 0
Asby.....	1,851 0 0
Rider.....	1,841 0 0
Mark.....	1,840 0 0
Sailey.....	1,836 0 0
Lawrence.....	1,836 0 0
Taylor & Parfitt.....	1,839 0 0
Perry.....	1,835 0 0
Brace.....	1,810 0 0
Conder.....	1,800 0 0

For altering warehouse, Finsbury-pavement, for Mr. Morley. Mr. W. Seeham Witherington, architect:—

Russell.....	£610 0 0
Larke.....	584 0 0
Taylor & Parfitt (accepted).....	539 0 0
Scribner & Co.....	533 0 0

For superstructure of building, corner of Lime-street and Church-street. Mr. H. H. Collins, architect. Quantities supplied by Messrs. Batsford Bros.:—

J. & J. Greenwood.....	£21,380 0 0
D. King & Sons.....	20,973 0 0
Ashby & Horner.....	20,610 0 0
Bampf & Co. (see last).....	20,355 0 0
Colls & Sons.....	20,520 0 0
Dove Bros.....	20,600 0 0
Chappell.....	20,481 0 0
W. Downes.....	20,380 0 0
J. Morter.....	20,268 0 0
Kirk & Randall.....	19,880 0 0
Merritt & Ashby.....	19,777 0 0

For rebuilding 30, Draper-street, Walworth-road, for Mr. F. Jordan. Mr. Edgar Leach, architect:—

Roberts.....	£2,243 0 0
Lynde.....	2,080 0 0
Lawrance.....	2,040 0 0
Rider & Son.....	1,986 0 0
Colls & Sons.....	1,987 0 0
Downes.....	1,947 0 0
Crocker.....	1,936 0 0
Tarrant & Son.....	1,930 0 0

For new road, culvert, &c., on land in rear of Liliput road, Victoria Dock, for the Rev. J. Roe and Trustees Mr. E. P. Loftus Brock, architect:—

Rutty.....	£290 0 0
Blackmore.....	280 0 0
Mattock Bros.....	265 0 0
Brass.....	249 3 8
Harris.....	268 10 6
Howard.....	268 0 0
Jackson (accepted).....	268 0 0

For rebuilding premises in Cambridge-road, for Mr. Henry Greyham. Mr. Lewis Solomon, architect:—

Bolding.....	£1,285 0 0
Canning & Mullins.....	1,082 0 0
Hawlett.....	1,080 0 0
Barnett.....	1,050 0 0
Palmer (accepted).....	625 0 0

For the construction of roadworks on the United Land Company's Woking estate:—

R. & W. Iles, Wimbledon.....	£1,195 0 0
M. W. Bowles, Acton.....	1,090 0 0
C. Lyons, Wandsworth.....	1,040 0 0
A. T. James, Hythe.....	1,062 0 0
T. Skinner, Horsham.....	929 17 0
Wilkes & Co., Devonshire-sq., E.C. 4.....	904 0 0
W. Harris, Camberwell.....	854 0 0
J. Hare, Clapham.....	825 0 0
Martin, Wells, & Co., Aldershot.....	800 0 0

\* Accepted.

For the erection of house, stables, &c., at Wollaston, for Mr. A. T. A. Pryor. Quantities supplied:—

Farden & Rooty, Wellingborough.....	£504 15 0
J. Morris, Wellingborough.....	485 0 0
G. H. Green, Wellingborough.....	474 19 0
G. Hackley, Wellingborough.....	454 0 0
J. Underwood, Wellingborough.....	445 0 0
G. E. Brown, Wollaston.....	443 10 0
Coopers, Wollaston.....	403 2 8
R. Marriott, Wellingborough.....	393 0 0

For new roads at Hendon:—

Vernon & Evans, Westminster-chambers.....	£1,000 0 0 1
J. Pizney, Hornsey.....	825 0 0
G. Impey, Leytonstone.....	685 10 0
Wilkes & Co., Devonshire-sq., E.C. 4.....	683 0 0
W. Miles & Co., Haverstock-hill.....	655 11 2
G. G. Rutty, Bromley-by-Bow.....	431 0 0
Wm. Adams, Amburst-road, N.....	418 0 0
A. J. Catley, Lloyd-square.....	410 5 1

\* Accepted.

For the erection of a pair of semi-detached houses, Mount Park Estate, Harrow-on-the-Hill South, for Mr. W. Winkley. Messrs. Carpenter & Ingelow, architects:—

W. Hussey.....	£2,180 0 0
Mariott Bros.....	1,885 0 0
H. Haynes.....	1,850 0 0
A. & H. Jarvis.....	1,798 0 0
J. Kindell.....	1,710 0 0
Furness & Bayard.....	1,575 0 0

For reinstatement of premises, 216 and 218, Hackney-road, damaged by fire, for Mr. H. J. Faulkner. No quantities:—

Fulley.....	£245 0 0
Thomas & Butland.....	779 0 0
Jarvis & Sons.....	550 0 0

For the erection of stabling at "The Yews," Kenley, Surrey, for Mr. J. Webster, Mr. W. Seeham Witherington, architect:—

F. G. & R. Vigor (accepted).....£696 0 0

For making, metalling, and sewerage private streets, and also for the sewerage and draining of land, both situate in the parish of Evington, near Leicester. Mr. Frederick Jackson, engineer. Quantities supplied:—

Gibbins & Osborne.....	£548 11 2
Wm. Gordon.....	654 4 8
Thos. Smart.....	478 3 0
Jno. Lea & Co.*.....	458 5 0

\* Accepted.

For additions and alterations to St. Mary's Catholic Church, Croydon. Mr. Fredk. A. Walters, architect.

Quantities supplied by Mr. W. H. Brayshaw:—	
Conder.....	£3,898 0 0
Dove Bros.....	5,420 0 0
Charles.....	5,033 0 0
Deards.....	4,913 0 0
Macey & Sons.....	4,471 0 0
Farmington, Braintree, Essex.....	4,173 16 0

\* Accepted.

For warming and ventilating, by their new hydro-caloric apparatus, the new Synagogue at St. John's Wood. Mr. H. H. Collins, architect:—

J. Weeks & Co., Chelsea.....£187 0 0

For alterations and additions to the Baker and Bax's public-house, Appold-street, City. Mr. Edward Brown, architect:—

Shurmer (accepted).....£207 0 0



For second portion of Bristol University College. Mr. Chas. F. Hanson, architect. Quantities supplied:—

Vaults	£8,150 0 0
A. J. Beaven	6,005 0 0
Cowin & Son	5,857 0 0
Hatherley Bros.	5,857 0 0
Church	5,839 0 0
Davis	5,645 0 0
Stephens & Baskin	5,500 0 0
Clark, Fishponds	5,423 0 0
Eastbrooke & Sons	5,100 0 0
Wilkes & Sons	5,060 0 0
Brook & Bruce	5,070 0 0
Forse	4,990 0 0
Lewis & Edbrooke	4,940 0 0
Howell & Son (accepted)	4,985 0 0

For St. James's Congregational Church and School, Newcastle-on-Tyne. Mr. T. Lewis Banks, architect. Quantities by Mr. J. Sargeant:—

Gibson, Newcastle	£14,344 1 0
Elliott, North Shields	13,696 0 0
Gaddon & Son, Durham	13,750 1 2
J. & W. Lower, Newcastle	13,733 0 0
Broomhead & Kewick, Newcastle	12,899 0 0
W. & R. Reid, Newcastle	12,424 9 6
Grisedale, Newcastle	12,383 19 10
Robson & Son, Durham	12,110 0 0
Scott, Newcastle (accepted)	11,437 12 3

For the erection of first portion a firework factory, stores, stables, &c., at Mitcham, for Mr. James Pain, Mr. Spencer Green, architect:—

G. Barnes	£150 0 0
B. Cooke & Co.	440 0 0
J. Marsland	435 0 0
T. Bonor, Julian, & Co.	425 0 0
J. Green	400 0 0
J. Holway	384 0 0
R. G. Battley	380 0 0
Smith & Bulled	375 0 0
Burch & Moor	375 0 0
A. Capew	360 0 0
Turk & Appleton	346 0 0
G. Eddy (accepted)	345 0 0
S. Page	313 0 0

\* Extra for red bricks, &c., 30s.

For the erection of new schools, Hague-street, Bethnal-green, for the School Board for London. Mr. E. R. Robson, architect:—

W. G. Lade	£10,392 0 0
F. & F. J. Wood	10,234 0 0
J. R. Hunt	10,077 0 0
W. Shurmer	9,993 0 0
Higgs & Hill	9,794 0 0
B. E. Nightingale	9,694 0 0
J. T. Sargeant	9,481 0 0
Blimpton & Co.	9,397 0 0
C. Cox	9,198 0 0
E. Lawrence	9,125 4 0
T. Boyce	8,773 0 0

For the Orlestone U.D. Board Schools. Mr. A. Smith, architect:—

Knock, Ashford	£1,150 0 0
Bingham, Heacombe	1,137 0 0
Pettis, Folkestone	1,112 0 0
Coxes, Canterbury	1,094 0 0
Jordan, Dymchurch	1,050 0 0
Denne, Walmer	1,047 0 0
Howland Bros., Ashford	1,028 0 0
Bourne, Woodchurch	999 0 0
Martin, Ashford	996 0 0
Hassell, Lydd	991 0 0
Dryland, Ashford (accepted)	982 0 0

For the erection of a Board School, at Cinderford, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect:—

Pearson, Ross	£2,753 0 0
Jones & Co., Gloucester	2,428 0 0
King, Gloucester	2,338 0 0
Bilings, Bros., Cheltenham	2,305 0 0
Clemens, Bros., Chazhill (accepted)	2,316 0 0
Downton, Drybrook	2,300 0 0
Duggan & Nourse, Leominster	2,170 0 0

For the erection of boundary-walls, gates, and making and draining playgrounds, at new Board Schools, Steam Mills, Gloucester, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect:—

Coleman Bros., Chazhill (accepted)	£455 10 0
Duggan & Nourse, Leominster	446 8 1
Mills & Marfell, Cinderford	442 16 1

For the erection of a Board School and teacher's residence, at Lydbrook, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect:—

Stephens & Baskin, Bristol	£2,449 0 0
Welsh, Hereford	2,438 0 0
Jones & Co., Gloucester	2,284 0 0
Morgan, Monmouth	2,213 18 6
King, Gloucester	2,088 0 0
Coleman Bros., Chazhill	2,045 0 0
White, Abergavenny	1,846 0 0
Foster, Abergavenny (accepted)	1,900 0 0

For the erection of boundary-walls, gates, and making and draining playgrounds, at new Board Schools, Joy-green, Gloucestershire, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect. Quantities by the architect:—

Watkins, Lydbrook	£780 0 0
Foster, Abergavenny (accepted)	780 0 0

For heating Board schools at Steam Mills, Gloucester, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect:—

Jackson, Liverpool (hot-water H.P.)	£263 0 0
Jones & Sons, London (hot-water L.P.)	92 0 0
King, Liverpool (hot-water H.P.)	68 0 0
Holden, Sheffield (hot-water L.P.)	63 10 0
Shillito & Shorland, Manchester (Manchester grates)	54 10 8
Holden, Sheffield (hot-water L.P.)	44 0 0

N.B.—All except Shillito & Shorland's tender includes carriage and fixing.

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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**WESTWOOD GROUND,**  
Box Ground, Combe Down,  
Corsham Down,  
And Farleigh Down.  
**RANDELL, SAUNDERS, & CO., Limited,**  
Corsham, Wilts. [Advt.]

**Box Ground Stone**  
Is the best for use in all exposed positions, being a well-known and tried weather stone.  
50,000 feet cube in stock.  
**PICTOR & SONS,**  
Box, Wilts. [Advt.]

**Doubling Freestone and Ham Hill Stone**  
of best quality, in blocks, or prepared ready for fixing. An inspection of the Doubling Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stones. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. B. WILLIAMS, 73, Charlotte-street, Portland-place, W. [Advt.]

**Doubling Stone and Ham Hill Stone**  
of best quality. Prices and Estimates, including delivery to any Station, on application to STAPLE & HANN, Quarrymen, Stoke-sub-Hamdon, Ilminster. Agent, Mr. E. CRICKMAY, Langbourn-chambers, 17, Fenchurch-street, E.C. [Advt.]

**Asphalte.**  
Seyssel, Patent Metallic Lava, and  
White Asphalts.  
**M. S T O D A R T & C O .**  
Office:  
No. 90, Cannon-street, E.C. [Advt.]

**Asphalte.**—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 33, Poultry, E.C.—The best and cheapest materials for dampcourses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [Advt.]

**Immense quantities of**  
**DRY WAINSCOT,**  
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**DRY WALNUT,**  
in all thicknesses.

**B. J. HUDSON & SONS,**  
Whitefield-st., W., and Great Peter-st., S.W.,  
London. [Advt.]

**MICHELMORE & REAP,**  
Manufacturers of

**CHARLES COLLINGS & PATENT**  
**COLLINGS' PATENT HINGES,**  
**LEVER, SCREW, & BARREL BOLTS,**  
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# The Builder.

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### The Proportional Harmony of Utility and Grace.

THE circumstance that architecture is both a useful and a fine art places it in a twofold dependence on considerations of proportion. It is manifest that, so far as utility and convenience are concerned in the design of a building, proportion of parts must be considered and studied assiduously no less than in the works of a watch or the construction of a steam-engine. Nay, certain calculations of proportion have to be entertained before the details of design come positively into question:—

"When we mean to build  
We first survey the plot,  
then draw the model;

And when we see the figure of the house,  
Then must we rate the cost of the erection:  
Which if we find outweighs ability,  
What do we then but draw anew the model  
In fewer offices, or at least desire  
To build at all?"

Henry IV., Part II.

In such preliminary deliberations an important problem will usually be the relative value to be conceded to the directly useful and to the graceful. There is a familiar point of view from which grace and beauty tell as matters of usefulness. The value in use of, let us say, a hospital, seems measurable by the accommodation it affords for furthering patients on the way to alleviation or cure; yet there is no doubt whatever that a sum which would extend it by an additional ward may sometimes be wisely and economically diverted to giving the structure architectural distinction on a conspicuous and even expensive site; by such consolidation of popular regard for dignity are attracted the voluntary subscriptions, without which even what wards are retained could not be adequately supported.

And quite as rationally, or even more so, the private individual who seeks to house himself agreeably is wont to sacrifice some extension of internal convenience for the sake of certain enjoyment to be derived from devoting a balance to external embellishment. The question is manifestly one of proportion and estimate of appropriate proportion; if resources will only extend to providing merest necessities of con-

venience, of course no question of the kind arises; fine art has no standing ground, and the coarser utilities can alone be consulted. But otherwise, although mere creature comfort, if encouraged and indulged, would be ready enough with a list of still unsatisfied claims, the point may easily be arrived at even by the too stations of personal ease and luxury, where further concession in this direction would involve disproportionate sacrifice in another. Even with the sordid, if not with the necessitous, the beauty of a tree may counterbalance its value as timber. There is incongruousness, which is disregard of proportion, in the splendour of the interiors of some entire streets of London houses, and the unmitigated blankness of the exteriors.

Still a legitimate scope is to be allowed to diversity of individual taste in the apportionment, within limits, of interior and exterior decoration; and as regards interiors alone, the proportions of apartments are as fitly as necessarily accommodated to individual tastes and purposes. An unusual, but not, therefore, extravagant, share may be assigned to a library, to reception-rooms,—nay, even to billiard and lounging rooms or conservatories. Whether, in any particular case, a balance is preserved which merits the title of harmonious combination, depends on a moral consideration,—is to be declared accordingly as it does or does not represent a self-consistent and worthy balance of purposes and preferences in the occupant's disposition. In the superior town-houses of the wealthy class in London of a former date, we constantly find the reception-rooms and grand staircases magnificent and most liberally spacious; but rooms for lodging the necessarily numerous household, and for children younger or elder, are pinched to an extent that cannot be justified by any theory of harmony whatever. The London we inherit is not wanting in examples of the forfeiture of internal advantages for the sake of supposed and often of successful external effect; the too rare and scanty sunbeams of an unfavourable aspect are intercepted by an unnecessary colonnade; windows of upper rooms are too high or too low,—are near the ceiling or down on the floor,—and enlivening views are cut off by the excessive projection of a cornice.

The reign of all that is inimical to proportionate harmony is complete when interior convenience is sacrificed for an exterior effect that is not beautiful after all, and in place of advantage there comes gratuitous aggravation.

The example of St. Paul's, however, may be adduced for a legitimate and successful solution of a problem of compromise. The dignity of the exterior was here of more universal importance than internal finish; and one having to give way of necessity. When justly gave the balance in its favour. Types of vulgarity are presented by glaring mimicry of magnificence out of reach,—great portals to little houses, towers to cottages,—shall we say churches and

chapels that look like cathedrals in little?—all cases of dwarfs assuming the style and airs of the gigantic: frogs puffing themselves out to rival a bull; jays parading in misfitting suits of peacocks' feathers.

The ultimate generative principle of harmonious design must, therefore, be harmony of purpose,—the conception of an object,—of an ultimate result to be attained by appliances of greater or less elaboration and complexity; as purposes of any considerable scope and dignity must needs involve complex elements, but simple and self-consistent and self-coherent in virtue of a chief concernment which effectually dominates the supplementary and subsidiary. Nature is rife with examples of such harmony in complexity. In any particular animal we choose to make the subject of study, we find the main purpose of the preservation and continuance of a species provided for by endless adjustments to special environments and conditions of existence; the organism is suited for the search, capture, and digestion of particular kinds of food, for protection against special vicissitudes of climate, for self-defence against enemies endowed with certain instincts by counter instincts and faculties for flight or conflict, for the production, care, and rearing of offspring.

The simplest conception of a dwelling-house gives a parallel in art,—materials have to be distributed for support, protection from weather,—ingress, egress, admission of light and air,—various apartments, variable in size and position, to subserve separate and combined purposes, kitchen, nursery, bedrooms, living-rooms, study, and so forth, halls, passages, staircases, according to the type of requirements and circumstances of the occupant.

These general considerations may be sufficient to guide to rough determinations of relative distribution and proportion, especially when precedents and models are tolerably plentiful and accessible. A house, after all, does not absolutely depend for ordinary usefulness upon proportionate adjustments so universal and minute as are required in a chronometer, or as exist in the living organism of a bird or a human being.

Even the very worst mischiefs of ugliness, as well as of inconvenience, may be avoided with considerable success in this inartificial process of design. When a door has been contrived wide enough and high enough for convenient entrance, "general look" may prompt to a modification of dimensions which will render it agreeable, and be adopted on that account solely and simply. And even in the same way the adaptation of one part to another may,—when natural sense of proportion exists,—be very effectively combined. This is what we know occurs when one endowed with a natural ear for music sings precisely the right note to be second to an educated singer.

But the last and the refined finish of music is not to be achieved in this instinctive and spor-



taneous fashion, even by execcutants; and as to composers, a close and exhaustive study of theory is essential if they are to produce truly finished and harmonious compositions.

To what extent is such precision desirable, if not indispensable, in architecture? The observance and the value of observance of precise proportion in the matter of bilateral symmetry is obvious enough. The expression, and the value of the expression of equilibrium and stability in cases where, as in the disposal of vast weights and masses, stability is all-important, are self-evident. The necessity or advantage of precise proportional divisions of the supposed members to each other, though the advantage of a general order of gradation may be manifest, is by no means so self-evident.

As regards vertical distribution, indeed, there is the question whether any value of accurate proportional distribution is not at once done away with by the disturbing effect of perspective at all but very great distances. The case stands thus:—

Let the height of a spire be exactly equal to that of the tower it springs from, it will not tell as equal to it, and at every change of distance of the spectator the proportional difference will vary. What, then, is the value of the precision?

Inevitable and important points of view will often prescribe certain adjustments. Sir Christopher Wren may have rightly enhanced the drum of his cupola in order to present the cupola in happy composition when seen from an approach on the slope of Ludgate Hill.

Of the necessity for taking perspective diminution of remote parts into serious consideration, and making due allowance for it, there can be no doubt whatever; but this consideration alone does not reply to our difficulty. The ancient statuary knew that in a colossal figure it was necessary to give an unnaturally large dimension to the head if it was not to appear disproportionately small; but he may still have thought it necessary to adhere to some definite proportion as to make it one-seventh of the full stature of the figure instead of only one-eighth, and instead of enlarging it independently of any precise commensurability. It may be recognised that a spire must be more than equal to the height of its tower, if it is to tell as equal, but there may or may not be an advantage in enhancing it in execution by some definitely proportioned difference.

The question seems to be one which it is difficult to decide dogmatically,—the difficulty is equally presented, though in more moderated form, when we deal with dimensions nearer to the eye,—the area of a hall or its height and breadth relatively to its length.

Is it a sufficient reply to say that, inasmuch as effect in design requires that certain differences and even gradations of differences should be manifest,—should tell,—in virtue of differential dimensions, it is more systematic to regulate those differences with numerical precision than merely at guess and at random?

At any rate, it may be said, will not simple commensurability serve our turn? Let larger divisions be divisible by a unit of 6 in., and others by 3 in. or by even  $\frac{1}{2}$  in. or  $\frac{1}{4}$  in. The divisions of the foot-rule will always then avail for guidance in execution. If we propose to adhere to precisely derived proportions, we shall inevitably and constantly be thrown upon dimensions which are not coincident with any subdivision marked on the carpenter's rule.

Mechanical convenience, however, must not block the way when we are in pursuit of theoretical principle. If there is a fair presumption in favour of the theory it must be worked out strictly, whatever laxity in application may afterwards be indulged in or winked at, as winked at hard it is in the equal temperament of the piano and the organ. Theoretical rigor is incumbent on the present occasion, when it is proposed to praise the study not only under the guidance of original observation of nature, but also of the Greek, who, as interpreter of nature, will be found to have repudiated conformity to fixed subdivisions of any standard measure.

It can be shown by authentic examples of ancient practice that the most distinguished of the Greek architects accepted axioms such as the following as certified by a natural guarantee:—

1. The peculiar value of precise proportions most precisely executed.

2. The especial value of proportions of low numbers.

3. The value of ratios of decided but not excessive difference between the terms.

4. The value of a scale or series of proportions limited in number and combining distinctness with continuous gradation.

There is something more than prejudice, more commendable than regard for habit and tradition, in the deference thus paid to the Greeks. The architectural designs of the Greeks, even when adhering to one common general type, are in every case distinguished by visible peculiarity of proportion even in works of the same architectural style. The beauty of the designs is not more spontaneously and cordially recognised than the dependence of that beauty on proportion; both have been admitted frankly by one generation after another, and yet the secret of the application of proportion,—it has as frankly been admitted,—has ever eluded research. The Greeks, it is clear, had penetrated by genius and by study to the arcana of Nature, and we may hope to gain help towards seizing the same clue by interrogating them through their works, while by addressing ourselves at the same time directly to considerations of natural propriety we may sometimes gain a first hint that will put us on the track of the Greeks.

The statements thus advanced as to the practice of the Greeks will be abundantly justified by instances and illustrations to be adduced hereafter; but in order to appreciate these it is desirable in the first instance to set down a clear statement as to the primary elements for the construction of a scale of proportion upon one principle or another, the natural basis of true theory, ancient or modern. Every possible variety of proportion is included, as already mentioned, between absolute equality, 1:1 on the one hand, and absolute disparity, 1:0 on the other. Quantities are either equal or unequal, and it is clear that in whatever proportion we make one quantity greater than another, we do but arrive at a ratio which would have been encountered, only with reversal of the terms, had we made it in a certain degree less. If we commence with two equal lines and alter one by successive diminutions, the proportional differences will be the same as if one had been successively enhanced. The comparison of a quantity and its half, or a quantity and its double, gives the same ratio, 1:2; and so of any greater or less differences. The adoption of a scale of proportion involves the limited selection of certain ratios intermediate between the extremes, supplying the required diversity and gradation, and governed by reference to the peculiar application which is to be made of the scale.

The diatonic scale of music supplies a familiar example of series of proportions of special suitability which, taken in one direction, advance from equality to double, and, in the other, proceed by parallel stages from equality to the half. The middle C of the piano is produced by half the number of vibrations that produce the C an octave higher, and by double the number that produce the C an octave below it; and the intermediate notes of each octave have corresponding relations.

The stages of advance are marked by the proportions of the following series, in which the numerator expresses the same constant number of the vibrations that produce the middle C, while the denominators mark the relative number of vibrations that produce the successive concordant notes:—

$$\frac{1}{1} \quad \frac{8}{9} \quad \frac{4}{5} \quad \frac{3}{4} \quad \frac{2}{3} \quad \frac{1}{2}$$

The progressive character of these ratios becomes more manifest by reduction:—

$$\frac{8}{8} \quad \frac{8}{9} \quad \frac{8}{10} \quad \frac{8}{11} \quad \frac{8}{12} \quad \frac{8}{13} \quad \frac{8}{14} \quad \frac{8}{15}$$

In this series we observe certain very simple ratios which are inevitably required and appropriate in some application or other whenever proportion is applied to any art;—they are those which have a difference between their terms of unity,  $\frac{1}{8}$ ,  $\frac{1}{9}$ ,  $\frac{1}{10}$ , &c.; but the series, even so far, it will be observed, is not numerically consecutive; the ratios  $\frac{1}{2}$  and  $\frac{1}{3}$  are absent; this is due to the physical nature of resonance from which the series is deduced which excludes these ratios, fully applicable as they are in other arts, while the same cause inevitably induces the insertion of such a ratio as  $\frac{8}{15}$ , and others that seem still more anomalous in the series. Laying out of sight the particular ratios of this scale as having special propriety in a different connexion, we may still study its general characteristics with advantage.

We observe that it consists of a limited series of ratios taken out of an unlimited number

possible between the two extremes, and it will be further observed that there is an approach to an average in the intervals between the consecutive ratios. The principle of this scheme is such as must be of value in the employment of any system of proportion in any art; it is, namely, that while a variety of proportions becomes available for a variety of applications, each acquires a power of relief by well-defined contrast with its associates,—a distinct character is preserved for each in succession in virtue of not being liable to confusion with others around it that are only slightly different.

Let us illustrate this by examining a scale of ratios of which the terms proceed by a common difference of unity, as thus:—

$$1:2-2:3-3:4-4:5-5:6-6:7-7:8-8:9-9:10$$

It is clear that the series is advancing towards equality between the terms, which, however, so long as the common numerical difference is observed, it can never reach; it is also manifest on consideration that at each advance the relative difference of the terms becomes less and less. The ratio 1:2 gives a double square; 4:5 gives an oblong that only exceeds a square by a fourth; while 9:10 gives an oblong which exceeds a square by no more than a ninth. The difference between an excess of an eighth and a third and a fourth.

Distinctness and decision,—conditions of artistic effect,—could, therefore, be obtained from employment of such a scale only by the entire suppression of some of the ratios set down, and by insisting preferentially on the employment of others.

The same remark will apply to the construction of scales which proceed by common difference between their terms of other numbers, for example:—

$$1:3-2:4-3:5-4:6-5:7-6:8-7:9-8:10 \\ 1:6-2:7-3:8-4:9-5:10-6:11-7:12-8:13 \text{ \&c.}$$

As these series advance, omissions must be made, or all sense of pronounced distinction will be obliterated.

The cases of proportion in respect of dimension which come directly into consideration in architectural design appear to be such as these:—

1. Proportion between divisions of the same right line; as between the relative height of stories; between the height of a column and of the entablature above it; between the diameter of a column and the width of the adjacent intercolumn. This may be conveniently called Rectilinear Proportion.

2. Proportion between the sides of a rectangle; that is, between lines at right angles to each other, like those which measure the length and breadth of a plan, or the breadth and height of an apartment; the span and loftiness of an arch. Such comparisons may be referred to as cases of Rectangular Proportion.

3. Proportion between areas, whether taken on plan, as between vestibule and apartment, or on elevation, as between the superficial extent of the centre and the wings of a composition. As regards the comparative areas of circles, it will be found that the Greeks were aware that they are to each other in the ratio of the squares of the diameters.

4. Proportion between masses,—that is, between solid contents, independently of consideration of weight. Such comparisons may be instituted between the mass of a solid podium or basement and superstructure, or between a vertical tower and the horizontal mass of the building which it may be attached to.

One of the resources which proportion furnishes for combining variety with unity in a manner which, latent though it may be, and unrecognised, still tells upon effect, consists in the application of any single ratio of a scale in the three forms,—rectilinearly, rectangularly, and to area; and then again by its application to right lines and rectangles of different absolute dimensions, and sometimes horizontally, as on plan, or vertically, as in elevation. To take the simplest illustration: the oblong of a double square (1:2) may be repeated on plan in apartments of the greatest diversity of area, or on the sides or shorter ends of apartments; or the full height of a façade or of a particular architectural member may be divided in such a way that the height of one part is double that of the other; or, again, the breadth of one member may be double the breadth of another, and so forth. And a like series of changes may be rung upon any other ratio of the selected



series, and a given dimension may be made a term in two ratios, as when the height of a room compares with its length in one ratio and with its breadth in another.

The possible scales being thus indefinite and multifarious, what help or suggestion is available for the adoption of a particular scale for particular application? To this it must be replied that a design for a definite purpose will usually impose certain limits of proportion for the most important divisions or members of a design; it is upon these necessities of the case, which have to be studiously sought out and studied, that the character of the composition will essentially depend, and to them subsidiary proportions will have to be accommodated, either absolutely or by a process of give and take, in the course of which process the proportions generally may become defined, though ever with least concession on the part of the main conditions of the problem,—the dimensions and proportions of the primary requirements.

But, again, when the conditions of the architectural problem do not impose, to use the language of Kant, a "categorical imperative," and when imagination is responsible more independently for an effective model, the determination of conditions which are to control general proportions is the primary consideration. If the imagination of the artist is possessed with the beauty of a general conception, this beauty which captivates him is most certainly connected with an essential congruity of which it behoves him to penetrate the secret with such exactness that he can assign precise dimensions to a composition that shall realise it; shall

"Turn it to shape, and give to airy nothing  
A local habitation."

A truly poetic architectural conception hovers before the mind as fitfully as the conception of a beautiful and characteristic face before that of a painter. Let a painter tell of the wrings of his spirit before the precise outline is on his easel which satisfies him as doing justice to the idea as it revealed itself to his thought; the architect is likely to have his own trials between the time when he first in hot haste put down a rough draught that seemed to fit the principle of his suggested composition, and that still intermediate stage when he can rest with assurance upon the decision of certain leading proportions between parts as securing his main intention and providing the governing key for all that is to follow.

This now seems to be as far as we can safely advance towards a theory of architectural proportion by the "high priori road." In any case, under the conviction that we have in the works of the Greeks some successful examples of the application of such a theory, it is more convenient and probably more convincing to pursue our exposition from this point with the assistance of realised examples, and to connect recodified theory with practical adaptation as we go on, having regard to the very just Baconian theorem,—"Knowledge which is drawn from particulars entereth more easily into particulars again."

#### THE PERGAMON EXCAVATIONS.

THE first series of excavations at Pergamon, which resulted in the recovery of the essential portions of one of the most remarkable pieces of sculpture of antiquity, to wit, the altar erected at that place, representing in its decorations a Gigantomachia, or battle of the Gods and Giants, have been followed up by a subsequent series upon which the official report has recently appeared. The engineer, Herr Karl Humann, has been principally instrumental in accomplishing this important rescue, and obtaining it entire for the German Government, by whom the altar has been placed in the Berlin Museum, where it now stands restored. In the report referred to, Herr Humann gives an account of the operations of the second campaign, in which some important fragments of the work which had been missed in the first series of excavations were recovered. He gives a description, with illustrations, of the mound where the relics of the altar were found. Among the later discoveries were two statues of Athena, —one of colossal size, being more than 9 ft. high, and the other rather over the average height. Both these works are believed to have been copied from Athenian originals belonging to the fifth century B.C. There were likewise found in the second series of diggings no fewer than 198 inscriptions and fragments of inscriptions, most, but not all, of which will be placed in the

Berlin Museum. The great altar stood on the lowest of three terraces on the southern side of the western portion of the hill at Pergamon. On the uppermost terrace there was in ancient times a temple of Augustus, which the excavators dug out during the first campaign. On the middle terrace there was a temple of Athena on one side, and a two-storied hall on the other side. The upper story of this building consisted of an open gallery of pillars, between each of which there were plates in relief representing all sorts of antique weapons. These plates and their decorations form quite an encyclopedia of ancient arms. Twenty have been recovered in a good state of preservation, and they have already been cleaned and placed in the Berlin Museum. One of the illustrations is a rarity, consisting of a visier helmet, with a complete mask for the face. The report contains a view of the locality where the relics have been found, and a picture representing the buildings and altar as reconstructed, and the appearance they presented at the period when Pergamon was in its prime. Herr Humann believes that there are still many relics buried in the earth in this locality, and he says he hopes to be able to carry out a third series of excavations before long.

#### "HOUSEHOLD TASTE."\*

I TRUST that I need make no apology to an educational society for my choice of the subject on which I shall have the privilege of addressing some remarks to you this evening. Few will, I think, be disposed to question the right of "taste" to be regarded as a result of education or training, though it is undoubtedly often,—far too often,—a result entirely unforeseen and accidental; indeed, it is for the most part a result entirely unprovided for.

But, though this be the case, and though to impart this somewhat indefinable quality forms no part of the avowed intention of any educational curriculum, if it be a result of training it should excite the interest of those who have made a study of educational work.

I have said in passing that "taste" is difficult to define. The difficulty is not lessened by the word being made to cover so large a field,—not only all the arts, but even social demeanour; still, some definitions will cover even its widest range. We may fairly say that "good taste" is the sympathetic perception of fitness and proportion. It is, in fact (whether applied to art or manners), "the refinement of good sense."

It is better thus to start with a clear understanding of what we mean, lest we get lost among many spurious claimants to the title. "Tastes" are ever changing; fashion is mistaken for taste; and "public taste," as it is called (that "mongrel product"), is ever ready to warp our judgment.

It will be my object to consider a single branch of the subject; but this I desire to do, not by extolling one only period of art, one only scale of colour, or one only "prophet" of either, but by putting before you some suggestions which I shall ask you to subject to a few careful tests: the test of good sense, and of such laws as have stood hand-in-hand with the best art of all periods.

By "Household Taste" I mean all that expression of artistic preference which is exhibited in the adornment of the home, and I shall endeavour to devote the greater share of attention to homes of that class with which the majority of my audience are, perhaps, like myself, most familiar,—the homes of the great "middle classes," among which are probably to be found both the best and the worst examples of taste. It is natural that it should be so; for, whereas a very moderate income will allow of many evidences of cultivated taste, no amount of rapidly-made fortune will supply its owner with that subtle talent which, if it is to be acquired in its best form, must have the ground-work laid in youth. Good taste may be, indeed, must be, cultivated, improved, widened, cherished throughout life; but its germs will ever lie in early association, and its first growth can only be developed by influences which are powerful almost in proportion as they are imperceptible. If you look around you, and examine the various homes with which you are acquainted, you will not fail to perceive a very great variety, not only in the degree of attempt at artistic expression, but in the kind of preference exhibited. These will bear no sort of

\* By Mr. John D. Grace. Read before the Ascham Society on the 22nd of February, 1882.

proportion to the wealth of the occupants. In some homes, with very modest means, there is an evident expression of a desire to satisfy some craving of the eye for form or colour. In a few cases this attempt is sufficiently successful to awaken a sense of gratification, sometimes imperfect, but occasionally thorough. In the latter case, this sense of pleasure is renewed with each visit, and may be said to assist in permanently raising our opinion of the owner. In other homes, again, a similar attempt is obvious, but excites immediately our critical faculties,—not our spontaneous goodwill, nor any sense of contentment. In such instances we become more critical the more often we enter the house; and, whilst allowing that there is much to admire, we invariably fail to like it as a whole, and cannot avoid searching for defects. If we are not very good-natured, our verdict on the occupants is perhaps that they seek credit for more taste than they possess, the fact probably being that instead of following any consistent aim, they have copied more or less imperfectly results intended for the expression of an entirely different intention. We may be pretty sure in this case that our hosts have no very genuine taste, unless it be the taste for such mild flattery as is conveyed by those expressions of surprise to which their guests politely give the sound of praise.

I pass by the merely "showy" rooms which are supposed to be "handsome," or "cheerful," or "splendid," according to the extent of gilding and mirrors which cover their surfaces. No one is now expected to think of them in connexion with taste; and even their owners (to do them justice) would hardly expect a compliment on this score.

But then comes a class of home which is, perhaps, still,—as it certainly was but a few years back,—by far the most numerous among professional and middle-class people. In these houses no one appeared to feel the smallest desire that either the rooms themselves or anything in them should be beautiful; at any rate, the desire was not indulged. The rooms might be "cheerful" or dismal, fresh or dirty (in London they were ordinarily dirty), and when they underwent any renovation it was simply with a view to cleanliness. The rooms were spoken of as "cheerful," in proportion as the wall-papers approximated to white. You might sometimes find objects of interest on the walls or about the room,—mementos of travel, or curios, or even pictures; but these conveyed a depressing sense that they were there to fill up blank spaces, or to record a detail of family history, or to encourage respect for the family ancestors. That there were any of them there to give pleasure by their beauty would certainly never occur to the visitor, and had probably never entered the mind of their owner.

Now such interiors must be familiar to every one of you. In fact, the chances are that this would not be a very unfair description of the homes in which some of you first began to form impressions of your own. What an incubus of dreariness and ugliness to shake off! How utterly unschooled,—nay, how warped,—must all our youthful instincts for beauty become. I declare that when I reflect upon what were, in all likelihood, the early surroundings of many of the curiously grotesque young women one meets in society or in public, I am not surprised at their intensity of demeanour, nor the quality of the colours they affect. They seem to me like nothing so much as those aboriginal inhabitants of newly-discovered countries, who, having for centuries quietly eaten each other without the accompaniment of "fire-water," take to whiskey with such terrible avidity, that they rapidly create vacancies for the civilised white who sells the whiskey. The fact is, they have discovered the appetite too late to learn moderation in its indulgence. After all, "moderation" is a very essential characteristic of good taste. Lord Ellenborough, in his memoirs, mentions a conversation between the Duke of Wellington and Talleyrand in reference to "popularity." The Duke said that "those who loved it never loved it with moderation," to which Talleyrand replied, "Il n'y a jamais de modération où il n'y a pas de goût, et il n'y a pas de goût dans l'amour de la popularité." Was not this man of the world, with his shrewd wit, and keen sense, doubly right? The lack of moderation is the explanation of half the bad taste we see; and a desire of "popularity" is at the root of much of the rest. "Taste" with many people means "being in the fashion," and being in the fashion means (more often than



not) doing as they do who are a little better off than ourselves. The natural consequence of this is failure; but the worst of it is that, while the failure is more or less evident to our neighbours, we ourselves remain in blissful contentment, missing the valuable, if bitter, lessons which conscious failure teaches. How often has the advice to moderation been crystallised into proverb. Wherever art is concerned they should be written over the doors:—

"*Ne quid nimis*,"—Not too much of anything.

"*Μίτρον ἀγίον*,"—Moderation is best.

"*Μῆδὴν ἄγαν*,"—Not even one too much.

Yes, that is the golden rule, not even one too much, and so often as it is forgotten or broken, you may have talent, art, imagination, power, but "good taste" you will not have.

But, say you, having heard so far what leads towards the expression of *bad* taste, let us hear now what you have to say about the acquisition of good taste, or its expression. Well, I would repeat what I have said,—that its first germs are laid subtly in youth, either by our visible surroundings, or by the discriminating preferences of those by whom we are trained. For let me here point out that it is not so much the being surrounded by what is ugly or sordid, as being brought up to regard the ugly and sordid with indifference,—to become *hardened* to them, which is really injurious. The child who hears and sees selection made between what is refined or true, and what is coarse or false, has already some foundation laid for the cultivation of true taste; and I would go even further, and say that "better discussion and selection, even when the selection be sometimes wrong, than that all be unobserved, accepted, indifferent," for, though the child learn not to think the best, he at least learns that to think, and make selection, are functions he may exercise, and under future favourable conditions he may come to exercise them aright. But the mental callousness which comes of want of observation and habitual indifference to beauty, or its reverse, is a disqualification to which there is no cure in after-life.

Let me not, however, be misunderstood. I am not advocating the frequent discussion (for the benefit of the young) of wall-papers, art furniture (as it is called), blue china, and the like. That is far more likely to weary than to interest children (and perhaps herein many of us will confess to some remnant of childhood). What I do mean is, that we, the generation who have children to train and influence, should not let ourselves fall into indifference, or apparent indifference, to such objects of art or nature as may worthily excite admiration; and we should try to make our own taste catholic, our sympathies with what is beautiful wide and unprejudiced, nor should we hesitate to express them. So, also, where we see things mean, or false, or ugly, let us sometimes say so, taking care to have a better reason to give than that they belong to some style other than that one on which alone we have chosen to set our affections;—perhaps I ought to say our "temporary" affections; for, though not very old, I have lived to see the high priests of Gothic bow down and worship before the most debased period of Classic art.

We most of us know the air of sad superiority with which some folk regard the luckless person who can admire the works of any artist who has not received the tacit and melancholy diploma of merit conferred by the suffrages of their own set. It matters not that Titian, or Raffaele, or other great masters painted human beings as beautiful, as healthy, as full of life as they could find them; that the still greater Greeks portrayed the human form with all the roundness and grace of limb that subtlest art can define. These moderns know better than that. Fallor and the creep are the correct thing; and if you do not agree with them, they do not argue with, they languidly pity you. Well, at least save the young from these people, with their prejudices, their sickly sentiment, and their elegantly nasty verses.

After all, there is no taste so hearty, so pure, and so lasting, as the love of nature and all that can be tasted by nature, by which I mean not that which is mechanically or merely realistically reproduced from nature, but that which betrays a fine perception of the most beautiful characteristics of the natural object. Here is safe ground to begin upon indeed; what matters style or fashion when we are face to face with nature? She defies the copyist, and laughs at criticism, and so far as habits of observation are founded on her beauties, they must be good and wholesome.

Still, more contact with nature will not form taste, though the habit of observing nature is a great aid thereto, and this, if habits of observation are to be acquired at all, is the one most easily encouraged in youth. Without the power of ready observation no one can acquire a cultivated taste, since that must needs be the result of mental comparison between objects observed. Imperfect or slovenly observation is precisely what leads people into those inconsistencies and anachronisms which offend the more correctly cultivated judgment. It is to slovenly observation that we may attribute those innumerable grotesque travesties of well-designed originals that one sees daily in the household objects, in the furniture and in the dress of hundreds of well-meaning people.

These are the people who, having visited some pretty country vicarage, and been charmed with the paper that adorned the walls of some cosy room 9 ft. or 10 ft. high, insist on applying the same paper to their own town drawing-room, 13 ft. high or more; or who cannot endure life without a dado, regardless of the proportions of their own room. Proportion is about the last consideration that troubles their minds, and, if they want to decorate a room, or to buy a new dress, their first questions will always relate to whether this is the fashion, or how this suited some one else, under totally different conditions.

Coming back, then, to my theorem, that "good taste" is really "the refinement of good sense" applied to things æsthetic, it is obvious that, a keen sense of "fitness" and "proportion" is the true quality to encourage, if you are to lead up to good taste. To bring this sense into well-trained use in matters wherein art plays some part, it is of course necessary to have examples to refer to and for comparison. Where these are abundantly at hand, it can only be for want of rightly-trained habits of observation if the student fails to acquire a taste more or less good—more or less, according to the nature and proclivities, or the accidental bias of the individual, for, fortunately, there is no infallible standard of taste.

But no profusion of the best examples will avail those who lack observation, or whose sense has been corrupted. Look at the modern art-history of the people whose former works have stood for centuries the models for the civilised world! To the Greco-Turk the marble columns and friezes of a matchless Greek temple are only a convenient material for burning into lime; and even the modern Italian has so imperfectly learned habits of observation, that the more delicate and subtle charms of the monuments of his own land are (more often than not) completely unrevealed to him. He is proud of his art traditions and the works of his forefathers, so profusely scattered around him; but his treatment of them shows too often how completely absent is the real knowledge of the depth and breadth of their beauty. During the last few years incalculable mischief has been done in Italy by that active determination to restore which is the dread of the really cultivated. The more well-trained and capable we may be of appreciating what is best in art, the more cautious and self-distrustful shall we be in attempting its "restoration." It is those who are but half trained,—those whose eyes miss all but the most obvious beauty, who are so confident of their ability to "restore." Experience and the habit of observation have taught the former that Time is more merciful than the hand of man.

I hold, then, that if you would bring true taste to bear in your homes, your first consideration throughout must be "fitness" and "proportion"; and that to be able to attain these, or even to aim at them with any hope of success, you must have acquired that habit of observation which is the very foundation of artistic power, whether executive or critical.

I shall, if you please, assume that your position in the undertaking is rather critical than executive,—that of having to select or modify, rather than to suggest or create,—but, this being understood, it is not necessary that I should further dwell on the distinction in what I may say about the adornment of home.

If we take the not uncommon case of people about to move into a new house, or, at any rate, into a house bare of all internal finish, we shall usually find that they are not so absolutely independent in their choice of what is to be done as one might suppose. In many cases there are some existing possessions in the form of furniture and other accessories which will have to be

taken into account. Often these are retained not because they are admired, but for old association's sake, or because to part with them would involve loss. Both reasons deserve consideration, and are entitled to respect. If retained, these objects must be properly made part of the scheme, and not left to become casual excrescences. Should they be important in kind, or numerous, they may largely influence the choice of style; for it will be well to avoid absolute incongruity, though they be themselves unsatisfactory, or even ugly. As part of a whole which has been consistently thought out with them, they may, in effect, be dragged up to a higher level by association with better things, just as we find uninteresting persons who happen to associate with amusing or intelligent people reflect something of the interest attached to the latter. Certainly a good deal may be done in the direction of making common-place objects take their place in a house without giving direct offence,—though where it is question of colour the difficulty is often great, sometimes insuperable.

Accepting, then, what we may of such extraneous conditions, let us take the rooms themselves, and see what there is to guide or control us. There is, firstly, the actual proportion of the room to be considered. Is it high or low, long or wide, and do we wish to minimise or to mark this characteristic, for we can do either. Again, what is its aspect; and,—most important of all,—to what uses will it be put?

The proportions of height and width may be influenced in the decoration, firstly, by the broad sub-division, horizontal or vertical, of the wall surface. And here arises that momentous question, "Shall there be a dado?" In many cases this feature is a material aid to the proportions of a room, as well as being of great practical use, since the damage inflicted by the angles of chairs and tables is borne by this lower stratum of the wall instead of being shared by its whole area. I trust, however, that I shall not be thought to be flinging away recklessly any artistic reputation I may have, if I venture to assert that there are cases in which a room is better without a dado. I may, perhaps, save myself by saying that, in my judgment, these cases are decidedly in the minority. The height of the dado may be greatly varied not only according to the actual proportions of the room, but according to its character and its use,—and whatever the height, its effect will be largely influenced by the amount of contrast it exhibits to the upper wall surface. If they assimilate, not necessarily in colour but in depth of tone, the apparent height will be but little affected; whereas if one be much darker than the other the room will be distinctly lowered. The converse effect is produced where the contrasting feature is vertical, as with pilasters. By it is the horizontal lines by which the apparent height is most readily affected; it is, therefore, in the colour-treatment of the cornice, frieze, and dado that skill can best be turned to account.

These details are almost outside my subject, because they are technical rather than matters of mere taste. My object in alluding to them is to point out that questions which I have often had put to me, such as whether "dadoes are still in fashion," are rather wide of the mark.

As to the general subject or the proportion of rooms, I think some of us are apt to be unreasonable. People seem to think that every room should be made to look as high as possible. Now, I am all for having plenty of actual height for health's sake; but it cannot make much difference to one's health whether a room merely looks high or low. Rooms which are destined for the occasional reception of many people should not only be high, but look so, for mental impressions often affect one's sense of comfort. But there are many rooms, such as the libraries and studies in private houses, which decidedly look all the more comfortable for seeming low rather than high. A really cosy room must seem to be a low room. It would be difficult to trace the chain of association by which this postulate is arrived at; but it may almost be called essential to the "sentiment" of the place if it be a room of quiet retirement.

We may certainly be said to attach certain sentiments to certain rooms. One room is associated in the mind with the daily reunion of the family, with hospitality, and the more social moments of one's days. It is here that one localises the ideal "hearth." It is the centre of the family home, and, as such, there attaches to it a



certain sentiment of what is lasting and venerable, no less than what is warm and hospitable, which seems to call for expression. To gratify this sentiment seems to me quite reasonable; nor is it necessary in doing so to make the room a mere "imitation antiquity." There is plenty of room for individual fancy; only let the parts be consistent with each other, a sober scale of colour adopted and observed, and mere eccentricity avoided.

All "eccentricity" in matters of taste is attended with risk of failure, though it may sometimes be so clever as to succeed; but in any room where the guests remain seated in one spot for an hour or two at a time, it should be rigidly excluded.

There is room for a good deal of taste in lighting a dining-room. It needs some judgment to proportion the lighting of the walls to that of the table. When successfully done, the walls should form a good background to the guests, who in turn look their best and pleasantest, one secret of which is that the well-lighted white table-cloth, by its reflected light, smoothes away from the assembled faces many a shadowed line wrought by time or care.

The dinner-group affords me the opportunity of pointing out the advantage sometimes accruing from "concentration of effect," whether in the colouring or other ornamentation of any room. It is necessary, however, to insist that the effect must be concentrated, if at all, at some part of the room consistent with its ordinary use. In English homes of all ages the region of the hearth has been the "focus" also of ornamentation, and with excellent regard to use.

There is one quality very essential to success in matters of taste, and especially so in the decoration of the house. It is the quality of "reserve," whether in ornament or colour. Nothing is so fatal to good effect as to produce an impression that you have done all you can afford to do. If your room once becomes a silent "bit of brag," all is lost. It is quite as possible to convey this impression with a cheap paper, as with the most costly decorations, and so also is it as possible and necessary to secure a sense of reserve among the most finished splendours of the palace as in the more modest home.

It is in the drawing-room that we are, perhaps, more apt to trip in this respect. It is the room which we want to look most bright and cheerful; it must "light up" well, too, for we use it most at evening; it is, moreover, our "reception" or "company" room *par excellence*. These requirements all tempt us a little away from a certain individual domesticity which should be its best charm. Is there not the same sort of air about many a drawing-room that there is about a new company hotel—the air of being prepared to receive guests rather than to make them "at home." In such rooms you do not feel that you are in the family circle. You feel that the family has been kind enough to come and receive you *outside* the circle, in a room which has been specially prepared for similar interesting ceremonies.

Now this unpleasant sensation must be regarded as one for which the ladies are entirely responsible. It is often due to the careful daily obliteration of all traces of any rational occupation. The room is, perhaps, really used daily, but under restrictions possibly unuttered, but certainly inferred. The furniture is always restored to "its proper place," no books but the "elegantly bound" are allowed to repose on the table, newspapers are swept away, the only signs of writing are an impossible inkstand and blotter placed where no one could use them. Needlework is sometimes, by artful accident, allowed astray—it is "art-needlework," of course! And there the signs of life end, unless the piano be accidentally left open.

Now, whether the room be in daily use or not, "good taste" should alter this. It is neither refinement nor good sense to receive your visitors inside your house according to the letter, but outside the house according to the spirit. Who can wonder if men and women grow up with formal and awkward manners if they learn them in such rooms?

I trust you do not expect from me a sketch of a model drawing-room. No, it is far from my purpose this evening to dogmatise in these matters. I am all for freedom of choice and individual taste, so far as they are the spontaneous result of well-digested observation and reflection. But I should like to put forward a few general suggestions for your consideration.

When we make it a requirement that the

drawing-room is to be bright and cheerful (and I do not expect all my friends to admit even this much), are we quite sure that we best attain this end, or rather that we combine this end with our other daily requirements, when we propose to keep everything "very light," that is to say, use mere tints of colours? I am not at all sure of it: and I am now thinking most of rooms in London. Very pale tints take ordinarily very cold shadows, and where there are cold shadows a sense of chill prevails. I am not going to scoff at "white and gold." Only give white and gold some warm colours to reflect, and it is a valuable form of decoration. But white and gold doors and woodwork, with nothing but pale tints on the walls, delight me not. No one ever extracted a sense of cheerfulness out of that combination; though, when gentlemen went to evening parties in coats of "scarlet and gold," plum-colour, or bright blue, it was, no doubt, much less chilling than now. I must repeat that white is a most valuable colour where cheerfulness is required, but its use is to set forth and give value to colour.

From an opposite point of view "black" also is most valuable; and where you have reasons for employing low tones of colour (which should often be, for they afford repose to the eye, and set forth many of our household treasures with advantage), it is in black that we have the means of restoring to them a certain sense of purity, without sacrificing their subdued effect. There are, again, many cases in which the room itself will really be the better for being subordinated altogether to its contents, and in these cases (which are rather the exception) somewhat low tones may be retained throughout with advantage. I say throughout, because I am speaking of the larger surfaces; but, where this is done, the well-trained eye will require the relief, in small quantities, of brighter contrasting colour. This brighter colour may be supplied by the minor reliefs of the decoration and draperies, or even in the movable ornaments and accessories; but it must be there. This is one point in which feeble imitators of the really able professors of low tones break down. They have seen a part, but not all, of the original. Contrasts to low or "tertiary" tones may be made in two ways,—by the use of large masses of contrasting tones, or by small quantities of bright contrasting colour.

It would be a serious omission were I to make no allusion to those things which often materially affect the appearance of our rooms, and form our excuse for the treatment adopted,—our movable treasures. To begin with pictures, if they be of any excellence the walls in which they are to hang must be becoming to them. It is too long a subject to go into in detail, but I may make one or two brief suggestions. The first one is that there can be no greater mistake than to hang paintings on dirty light tints, which always "drag down" the tones of the pictures themselves, instead of setting them off as some suppose. (If you will observe the effect of dirty linen in juxtaposition with the human face, you will find an apposite parallel.) Another point is that the frames or mounts of the pictures must be taken into account. White mounts in gilt frames are useful where the wall is rather pale, or of mixed colouring; but should be excluded where the pictures hang on dark grounds. If the pictures are few and far apart, especially if "water-colours," they are best hung on quiet tones of not too dark colour. If numerous, the tone of the ground may be strengthened with advantage. In the latter case, and for paintings in oil, a rich red has no rival as a ground colour. A poor or dusty-looking red is not good. The proximity of black rather tends to enfeeble water-colours (which lack depth in the dark tones and shadows), but is beneficial to oil-paintings, which thereby gain in purity.

Then there is "china." In this present year of grace, a paper on "Household Taste" which made no mention of china and pottery would indeed be "the play of 'Hamlet' without the Prince of Denmark." Next to our pictures, our china is our most valued movable decoration. With its rich and pure colours, its soft whites, and its delicate glaze, it brings life, brightness, and interest into otherwise dark corners; abolishes the sense of monotony; and hints, in the brightest, prettiest way, a connexion with the past. It is one of the after-touches which conveys (when properly used) a sense of finish and a personality such as nothing else can quite make up for. But let me recall that warning motto which we wrote up over our doors, "*Ne*

*quid nimis*,"—"Not too much of anything." Do you think it is very good taste to hang up long rows of china plates, to perch your crockery on every ledge, and still to buy more crockery for yet more shelves? I do not find it stand the test of any canon of taste that I have ever tried to apply to it. It may be a convenience, or even a necessity, for "collectors," but as decoration it does not convey to me any sense of refinement, and I am sure it is not good sense.

From China to Japan is but a step, and much of what I have said above of porcelain and pottery may be said of the charming products of Japan. What a sparkle may be given to a room by a few objects from that wonderful home of colour! What enjoyment one may find in the exquisite workmanship and skilful art of the finer works that come thence!

But how easy it is to descend from admiration to mere craze! Rows of fans are as trying to one's sense of fitness as rows of plates; and, after all, it seems hardly reasonable that a drawing-room should resemble a shop.

Then there is the "needlework,"—yes, "art-needlework." Let us begin by begging for moderation in sun-flowers. This splendid flower has become a sort of badge of the age. All that the rose was to the Tudors, that the Union Jack is to the Briton at large, this, and more, the sun-flower is to (pardon me the epithet) the "Art Jingo." How clearly it announces the leading idea of the artist. No superscription could say so legibly, "I am 'of them.'" Therefore, I have only one word of caution to put forward. It is to ask, "need this beidsoo often?"

Again our motto, "*Mitrov šerov*,"—"Moderation is best." In sober earnest, I would make but one or two suggestions as to the needlework undertaken for home adornment. Do not waste time in hackneyed patterns or ideas; let your work show some thought, and, if possible, some originality; but let not this last be obtrusive. A lady's needlework, like her manners, will please most when unaffected.

I have reserved yet one subject to the last. What is it that gives the last and finishing touch to home, that touch which so indefinitely makes or mars the sense of refinement in the whole? It is the lady's hand. Its influence is always perceptible in innumerable small details, each in itself too minute to define, but together producing an effect more keenly felt than all the mere "art." It can add refinement to the beautiful,—can make us forget the ugly, while its absence nothing can quite compensate.

But in nothing can the lady's hand tell with more marked effect than in the arrangement of her flowers. No room is quite perfect without flowers, and they are more or less valuable as they are turned to best account. Even the very few that our poor Londoners can ordinarily obtain afford room for skill. Half their beauty may be thrown away if they are not grouped so as to aid each other. I will venture to offer one hint on this point. In arranging a group of flowers, consider not only the harmony or contrast of one with another, but which flowers you mean to be in full light, and which in shade, and group them so as to allow of some "concentration of effect." So also in placing your vase of flowers, select a light not too diffused, in which one part of the group shall be best lighted, and let that part stand where its background is in shadow. Attention to such points soon becomes habit, and the decorative value of your flowers is increased to a surprising degree.

Here I must close, leaving you to take up the thread of my subject, and perhaps to weave it into some useful web. Let me sum up briefly. The watchwords I have suggested are "Fitness," "Proportion," "Moderation." I ask for the inculcation of habits of observation and comparison, the encouragement of healthy and wide sympathies. Taste, if kept reasonably free of prejudice, may be improved throughout life, but the seed must be laid in youth. We, each of us, are responsible to the youth over whom we exercise daily influence and in whom we can awaken some sense of good and evil in art, as in morals. We can, almost without effort, give youth one more interest in the works of nature and of man. The door thrown open in youth leaves free whole provinces of innocent delight. Left closed, the lock is soon rusted, the key will turn no more.

Stoke Newington.—Plans for an infants' school in connexion with the Church of St. Matthias, have been prepared by Mr. Butterfield.



ART-TEACHING AND ITS INFLUENCE ON  
DECORATIVE DESIGN.

WEST LONDON SCHOOL OF ART.

MR. GEORGE AUGUSTUS SALA presided on Saturday evening last at the annual distribution of prizes to the successful students of this flourishing school, at the school buildings, Great Titchfield-street. The large room was crowded to its utmost capacity.

Mr. J. S. Rawle, F.S.A., the head-master, read his report to the Committee for the year 1881. It contained the following passages:—

In submitting to you my report for the year ending 30th of September, 1881, it gives me great pleasure to state that the West London School of Art did, in that year, win for itself a higher position than it had ever attained before.

Five hundred and fifty-seven students attended the school, being thirteen fewer than in the previous year. The day classes were attended by 154 students, and the evening classes by 403.

The school fees, in this period, show the greatest amount ever received, namely, £297, 8s. 7d., giving an increase of 68s. 5s. 2d. on the previous twelve months.

The Government payments on results are the highest yet obtained by our school, namely, 440s. 13s. 4d., which shows an increase of 93s. 10s. 1d. on the Government grant for 1880. These payments on results afford the highest possible testimony as to the industry of our students, who last year submitted their greatest number of works for examination at South Kensington, namely, 3,888, an excess of 1,311 on the number submitted in 1880.

The most advanced works from all the schools of art in the kingdom were selected by the examiners for the annual "National Art Competition," in which the West London School distinguished itself by gaining the highest number of awards, namely, four silver medals, five bronze medals, and six Queen's prizes,—total fifteen awards, or eleven more than in 1880. The fifteen awards were gained for studies from the life and the antique, ornamental and architectural design, and still-life painting.

It may, perhaps, prove of interest to you if I give a few particulars as to the position taken by our school, when compared with the twelve Metropolitan Schools of Art, omitting the National Art Training School at South Kensington, which is exceptional in its constitution.

The West London School gave instruction to 233 per cent. of the entire number of students under tuition in London.

We gained 25 per cent. of the "National Competition Medals and Queen's Prizes." In the "Third-Grade Advanced Examinations," we obtained 354 per cent. of the entire number of successes; also, 27 per cent. of the Third-Grade Prizes, and 15 per cent. of the Second-Grade awards.

A former student of this school, Mr. Oscar Junck, has recently gained the Gold Medal for Sculpture, and the Travelling Studentship, value 200l., at the School of the Royal Academy.

In the annual competition of the United Schools Sketching Club, in which five of the largest Schools of Art in London compete together, Mr. Edmund Caldwell, of our school, obtained the prize for the "Animal Subject."

Mr. Walter Graham, treasurer, made a few remarks as to the financial position of the school, with special reference to a debt of 1,350l., which, he said, it was very desirable to clear off. When this was done the school would be self-supporting. He appealed to all who could do anything in the matter to aid the committee in clearing off this debt.\*

Mr. J. D. Crace, honorary secretary, announced that the Menace-Smith Travelling Studentship† had been awarded to Mr. Henry Pegram, who, although the only candidate, had submitted works of great merit, fully showing himself worthy of the studentship.

Mr. Sala then addressed the meeting. He said:—Ladies and gentlemen, students of the West London School of Art,—The lucid and exhaustive statements made to you by your head-master and by your honorary secretary happily absolve me from the necessity of entering into a number of facts and details only recently acquired and imperfectly mastered by me, and I can thus at once address myself to

the matters on which I am desirous of speaking to you. But I may first, perhaps, be permitted to say that during a long and busy career, I have made it a rule,—a rule from which I think I have scarcely ever departed,—never to address a public audience without I had something to say, and unless I had some practical knowledge of the subject on which I proposed to speak, so that I might, however humbly, serve some useful end; for I look upon words as being very valuable things, which should not be wasted. It happens that during more than a quarter of a century I have been closely and intimately connected, and deeply interested,—and that not only from sympathy, but from the fact of one of my professional avocations being that of an art-critic,—in all that concerns art, which was the object of my passionate boyish love, and which now, in the autumn of my life, is my stay and my solace. That which I have to say to you refers mainly to the progress in the decorative arts which has been made within the last three decades. I do not know whether there are any here who remember to have seen, thirty years ago, an exhibition in Pall-mall, hard by St. James's Palace, in the magnificent mansion once the town residence of John Churchill, Duke of Marlborough, and now the town residence of his Royal Highness the Prince of Wales. The exhibition was a Museum of Horrors. The house was the property of the State, and in it the Government had temporarily housed in the year 1852 a number of objects, collected, I believe, by the then Department of Practical Art. The vast entrance-hall and the noble saloons of the old Queen Anne mansion were full of the ugliest things in the way of pseudo-artistic decoration that Mr. (now Sir Henry) Cole could gather together as examples of what to avoid. Horrible carpets, hideous tapestry, wall-papers shocking by their ugliness, revolting stained glass, and wretched iron work,—all embodying bad form or bad colour, and very often both,—were here to be seen. The Great Exhibition of 1851 was then nearly two years old, and the Department of Practical Art has since become the great art-teaching university of South Kensington. I wish always to remember these beginnings. But, in order to demonstrate that the aim of the then newly-established Schools of Design was to abolish "houses full of horrors," and to substitute in their stead houses which should be full of works of beauty and taste, there was really not much need to assemble so many ugly things within the walls of one house. One had only to walk about the streets and look in the shop-windows, or merely to glance at the furniture and fittings of one's own house, to be made aware that the age was essentially one of ugliness. We had been surrounded by ugliness everywhere since the beginning of the century. The rupture of the Peace of Amiens shut us out from the Continent and left us to our own artistic devices,—and miserable devices they were. I will not dwell on the period of the Regency; for, although I shall ever be horror-stricken at the monstrosity of the Pavilion at Brighton, and although I am aware that Nash and his followers were, from a certain point of view, very indifferent architects, I cannot forget that the Regency gave us those noble and spacious thoroughfares, Regent-street and Waterloo-place, in lieu of the slums of Great Swallow-street. Neither can I forget that the Regency converted old Marylebone Fields into one of the most beautiful pleasantries in Europe, Regent's Park. Our furniture up to the period of the Great Exhibition of 1851 was either meagre or clumsy, either shabby or garish. Great as was the renown of Rundell and Bridge as silversmiths,—you will remember the Shield of Achilles designed for them by John Flaxman,—the manufacturers of plate mainly excelled in the production of tasteless dish-covers and bad soup-tureens. The race-coats, candelabra, and presentation plate executed before the time of the World's Fair were almost entirely devoid of artistic value. Nor were our carpets, our curtains, our glass, our pottery, or paperhangings, on a par with, or even within a very long distance of, similar articles produced by Continental workmen. Such was the state of things when the wise and good Prince Consort, assisted by Henry Cole (whose name should always be mentioned with honour for what he has done in this connexion) and other gentlemen, took the interest of art in hand, and determined to put down ugliness as if it were Satan. But, first, the Schools of Design, few and feeble as they were at the outset, and next, the Great Exhibition of 1851, gave an impetus to arts

which had long been neglected, and, besides showing us what the foreigner had done, showed us how we might at first imitate the foreigner, soon equal him, and eventually surpass him. I am much struck by the admirable works of art produced by the students of this school, which I see on the walls of this room. Why, thirty years ago such works would no more have been seen in this neighbourhood than the Colossus of Rhodes or the "Moses" of Michelangelo. Although you are afflicted here with a heavy debt,—a debt which I will well bear in mind,—you yet enjoy the proud distinction of being second to none of the branch schools of art. Although International Exhibitions since 1851 have had a tendency, in some directions, to develop rather the commercial than the artistic spirit of the age,—some of the later displays of the kind being marked rather too strongly by such things as trophies of pickles, triumphal arches of chocolate, and bowers of candies,—still, the benefit conferred on the industrial and decorative arts by the congresses in question is too great and palpable to be denied or ignored. But, on the other hand, the Schools of Design—or, as they have lately been called, Schools of Art,—devoid, as they have been, of any showy or sensational attributes, have been steadily and unostentatiously pursuing their beneficent course, instructing, refining, elevating, the studious youth of the country. The age of ugliness has gone, let us hope never to return. The spread of art-education during the past thirty years is due in great part to five distinct boons. The first was the purchase by the Government, early in the century, of the Elgin marbles. The influence of these magnificent specimens of art was not at first very manifest except in regard to sculpture, and did not permeate into the decorative walks of art until much later. But the Elgin marbles are now recognised as invaluable art educators, not only by those who pursue in its highest phases the plastic craft, but by those who devote themselves to decorative work. The next boon was the Great Exhibition of 1851, and the series of recurring exhibitions. Not that all the exhibitions subsequent to that of 1851 were entirely successful from an art point of view, for albeit art and industry were well represented in them and albeit they included picture and sculpture galleries, the commercial element in them was somewhat too pronounced. For the third boon you have, very curiously, to thank two very different and conflicting things. You have to thank the fire which destroyed the Houses of Parliament, and you have to thank that remarkable religious revival, at first called Puseyism, and latterly Ritualism, which followed the publication of "Tracts for the Times." The burning of the Houses of Parliament led to a long controversy as to the style to be adopted for the new building. The Royal Commissioners at length adopted the Gothic style, and appointed Mr. (afterwards Sir Charles) Barry, who had previously gathered bright laurels as a Renaissance architect,—witness the Reform Club, in Pall-mall,—to be the architect of the buildings. With true modesty he called to his assistance a wonderful Gothic draughtsman and designer in the person of Augustus Welby Pugin, who has, perhaps, never been surpassed in his knowledge of Gothic decoration. To the building of the New Palace at Westminster we certainly owe the wonderful improvement which has taken place of late years in the art and manufacture of encaustic tiles, stained glass, metal work, and carving in wood and stone. Improvement in all these things and more is also, as I need hardly say, largely due to the religious revival of which I have spoken. Of its theology I have nothing to say. Among the other arts which it re-discovered and revived, mainly owing to the efforts of the late Sir Digby Wyatt, is the art of pictorial illumination. The fourth boon for which you have to be grateful is Japan. Now Japan was hardly heard of, and very little was known of it, in 1852. True, there was China, from whom we borrowed the willow-pattern plate and a great deal else which was not worth borrowing. From Japan, as soon as the country was opened to us, we learned a thousand beauties in design, in composition, and in colour,—beauties which now permeate the whole republic of art. Although I am not a crazy worshipper of "blue and white," and although I do not become hysterical over an "eight-mark" teapot, I cheerfully recognise the vast benefits which our artists have received from the study of Japanese art, characterised as it is by a

\* A printed statement distributed at the meeting says that the one difficulty of the school is now, and has always been, financial. "This difficulty largely increased with the occupation and fitting up of more extensive premises and the greater output demanded by increased efficiency. Like all similar schools of art, its existence depends on its receipts being largely supplemented by subscriptions and other external aid. A debt of over 400l. already hung over the school when it was decided to remove to more suitable premises. That debt is now increased to about 1,350l., and the existence of the school depends upon the sum being raised within a limited time. His Grace the Duke of Westminster has contributed the sum of 100l. to the end."

† Founded to enable students of decorative art to travel in Italy. (See Builder, vol. xi., pp. 82, 227.)



tenderness of feeling and brilliance of colour which are peculiarly its own. The fifth boon is one, perhaps, as to the advantage of which some of you may have your doubts. I mean photography, which was in its infancy in 1852, and which can scarcely be said to have come to maturity yet. Of course, there is photography and photography. Although it was at first scouted by high and mighty artists, and although the sun does err sometimes, photography has done one truly valuable service for you and for all students of art. It has enabled you to contemplate exact representations of the great works of the ancient architect and of the Medieval architect. You can learn from a photograph that which line engraving or wood engraving would never have told you. You can see the very texture of a building or other work from a good photograph of it, and hence the great value of photography to the students of art. Before the days of travelling studentships, and before photography was known, it was impossible for the great mass of students to judge of the exact aspect of the many marvels of art to be seen on the Continent. We have but to look around us in the present day to behold with wonder, as we should behold with gratitude, the results of the five boons to which I have called attention. We have but to look to the decoration of our houses and to the multitude of charming objects displayed in our art galleries, and in our shop windows, to know that art is progressing in every direction. It is clear that the immense art production which is going on on all sides around us cannot be accomplished without an amazing amount of hard work. And if I have any practical object in addressing you this evening it is,—rejoicing, nay, exulting, as I do, in the fact that the majority of you are young people,—to impress on you the necessity, the indispensable necessity, of hard work. I see on the walls the evidence of the long hours you have spent carefully, sincerely, and honestly in the pursuit of your studies. Many of you have other vocations, but you have worked here at your studies and have succeeded in producing the works which so well reward you. I implore you to persevere in your work, sedulously pursuing your studies in art. Doctors at the present day are very fond of telling us that we all work too hard, and we hear a great deal about " undue pressure on the brain," " destruction of tissue," and so on. So far as work is concerned, I have always let the doctors " go hang,"—not that I wish to fly in the face of the doctors, nor am I senseless enough to advise you to work till your eyes are dim, till your brain is dizzy, or till your wrist is so stiff that the pencil almost falls from between your half-paralysed fingers. I wish you to measure your own capacity, and to be guided by your own common sense, but, at the same time, to work as hard as ever you can. If you are young and healthy, and strong, and have good eyesight, and with these a strong will, then work early and late, work with all your heart, with all your soul, and with all your strength. When you awake in the morning, think that you see Time as a thief trying to steal your clothes. Jump out of bed, seize the robber by the throat, and go to work. Do not be too apt to think that all that the doctors say in depreciation of overwork is applicable to yourselves. We all know the story of the carrier. Although it has been told in a hundred different ways, perhaps the manner in which I am about to relate it may not be familiar to you. The elders of an ancient city, menaced with invasion by a neighbouring power, were gathered together in council to consider what means they should adopt to repel the enemy, and of what materials they should build their fortifications. The mason and the bricklayer, of course, recommended stone and brick, while the carpenter was equally decided in favour of timber. A carrier was consulted in due turn, and he replied, " There is nothing like leather!" In like manner I say, following the carrier, " There is nothing like learning." Go on learning, learning, learning, and you will eventually excel. But to what end all this labour? Why this persistence, this determination to excel? That you may be president of the Royal Academy? That you may ride in a golden coach? That you may be bidden to great men's feasts? That you may have a grand house built, that you may furnish it more grandly, and entertain grander company in it? That, in short, you may acquire fame and fortune? Alas! the race is not to the swift, nor the battle

to the strong, and fame and fortune rarely come together, even to the most deserving, and often do not come at all. No; I would have you excel first, in order that you may have the means of earning an honest livelihood. None of us are so highly placed, none so rich in the riches of this world, but that we may be beggars to-morrow. There is no more deplorable spectacle than that of a formerly rich young man reduced to poverty, and unable to do anything to earn his bread. Therefore, each of you do your best to acquire some practical craft which shall be to you in the time of need a protection and a shield. The next reason why I would urge you to excel in your work is that you may become good citizens, and that by the honest, earnest, and industrious pursuit of your craft you may be able to do some service to the State, for I maintain that the man who produces a beautiful thing or does good honest work directly contributes to the intellectual and material wealth of the community. Lastly, I would entreat you all to do your best to excel, for the sake of being happy, for the pursuit of happiness is one of the rights of man. It is so claimed in one of the noblest pieces of English composition ever penned,—the American Declaration of Independence; and one of the wisest and gentlest of English divines, Jeremy Taylor, the warbler of poetic prose, has told us that we have so infinitely kind a Father that we cannot please Him unless by being infinitely pleased ourselves. We have been divinely and mercifully told that in our Father's house are many mansions; but we may, as mercifully, be suffered to think that these mansions are not only in what we figuratively term " Heaven," but that they are in all His earth and in all His works,—in the whole universe as well as on this earth,—and that these mansions may be found in the tiniest and humblest of things: in the cell of the bee, in the cup of the convolvulus, in the down of a linnet's wing, and even in the golden sheen on the back of a beetle. My race is nearly run, and I may not live to see another mansion which I see plainly and distinctly with the eyes of a hoping mind. I see it rising far above the foundations; I see the scaffolding; I hear the masons and builders at their work; I see the real House Beautiful, into which no mean or vulgar or shameful thing will be permitted to enter,—the Palace of Art,—art which shall refine, elevate, and ennoble the people. I see the Palace, which, in its every beam and rafter, in its every arch and column, in its every soffit and cornice, from basement to roof, shall redound to the glory of God, the only and eternal source of all beauty and all truth and all right.

Mr. Sala then proceeded to distribute the prizes, which included the following:—

#### NATIONAL ART COMPETITION.

##### Silver Medals.

Head from the Antique,—Arthur Ellis.  
Figure from the Antique,—Rowland Holoake.  
Still-Life Painting in Oil,—Samuel R. May.  
Figure from the Antique,—Walter H. Webb.

##### Bronze Medals.

Studies from the Figure,—Carl Almquist.  
Architectural Design,—Frank Chester.  
Design for a Wall Paper,—Walter Chippings.  
Figure from the Antique,—Arthur Ellis.  
Design for a Frieze, in Colour,—Edward Hammond.

##### Queen's Prizes.

Painting from the Figure,—Carl Almquist.  
Design for a Wall Paper,—Arthur Candler.  
Still-Life Painting in Oil,—Margaret K. Howse.  
Figure from the Antique,—Frederick H. A. Parker.  
Painting from the Figure,—Henry A. Pogram.  
Design for a Frieze, in Colour,—Henry E. Tidmarsh.

##### LOCAL PRIZES.

For the Best Designs, in Colour, for a Frieze.—First prize, Edward Hammond, 5l. 6s.; second prize, Henry E. Tidmarsh, 2l. 2s.  
For a Design for a Chimney Piece.—Henry R. Paul, 2l. 2s.  
For the Best Designs for a Wall Paper.—First prize, Walter Chippings, 3l. 3s.; second prize, Arthur Candler, 2l. 2s.  
For the Best Study from an Antique Statue.—Arthur Ellis, 3l. 3s.  
For the Best Sheet of Historic Styles of Ornament.—F. Montgomery N. row, 2l. 2s.  
For the Best Model in Clay for a Frieze Ornament.—Jenkins Jenkins, 3l. 3s.

Mr. J. H. Donaldson moved, and Mr. J. D. Creed seconded, a vote of thanks to the headmaster and the other members of the staff. This having been carried,

Mr. Rawle replied at some length. In the course of his remarks he said it was intended in the future to give more attention to the school to the study of design than had hitherto been done, and he invited the hearty co-operation of the students with the teaching staff in that important work. Unfortunately there was

too often a disinclination on the part of students to follow the study of design as a profession. They were more generally desirous of following up the work of pictorial art than of seeking to win for themselves honourable distinction as ornamentists. Another difficulty with which the teachers were beset in connexion with this matter of the teaching of design was that students too often would not pay sufficient attention to the study of the human figure. Neither did they take up so earnestly as could be desired the study of art generally, nor duly study the characteristics and principles of ornamental art,—all of them branches of knowledge very essential to the success of designers. Why this should be he could not see, for while in the pursuit of pictorial art as a profession nine out of ten and even nineteen out of twenty students would never obtain more than tenth-rate positions as painters of pictures, and would be sure to meet with all those attendant bitter experiences which told them (unfortunately too late) that they had mistaken their vocation, on the other hand, in the profession of an ornamentist or of a decorative art workman there was a wide and extending field of success and emolument,—one in which skilled thought and skilled labour were increasingly in request. He trusted that his remarks would not be regarded as intended to cast a wet blanket over the pursuits and aims of those students who were taking up pictorial art, for where true genius existed it would undoubtedly assert itself. He saw no reason why there should not be produced from the students of the school a band of ornamentists and decorative artists who should, by their work, mark a distinctive epoch in the history of the school. He would suggest that all employers in any of the branches of art-workmanship should make it a condition in their apprentices' indentures that they (the apprentices) should regularly attend some school for the study of the art of design during the time they were bound. That would be a step towards combining the art-training of the school with the technical training of the workshop. That was a common practice in France, and when he was at Nottingham he got it introduced there, where it was found to answer exceedingly well, there having been at one time as many as fifty apprentices attending the art-schools at Nottingham, their fees being paid by their employers. Upon students engaged in the study of design, he would urge the necessity of thoroughly mastering the characteristics of former styles,—in other words, to lay for themselves a foundation built upon the experience of others,—before they attempted to do anything original for themselves. In conclusion, Mr. Rawle dwelt upon the advantages offered to art-students in London by the South Kensington and British Museums,—advantages which he urged them to avail themselves of, not forgetting, at the same time, to go to the great treasure-houses of Nature.

On the motion of Mr. R. W. Edis, F.S.A., a vote of thanks was given by acclamation to Mr. Sala, and the proceedings terminated.

#### A FREE HOSPITAL FOR RUGBY.

THERE are plenty of generous people in the world; many, indeed, who never make their generous feelings known through fear of doing harm in their efforts to do good. Mr. R. H. Wood, a respected inhabitant of Rugby and a constant attendant at the Congresses of the British Archaeological Association, has just now allowed it to be known " that, in accordance with the wish of all parties, it will be a pleasure to him to carry out the intention to found a hospital for the poor of Rugby." These words imply the offer of a freehold site, a new hospital, and ample endowment to maintain the institution in proper working order. We are assured that the style and architecture of the building, its domestic arrangements, surgical appliances, medical supervision, and governance, will be on a par with the spirit that prompts the offer. We are fastidious in respect of hospital plans and hospital management, so that our praise at present refers only to the offer, but in that respect it is sincere and hearty.

**The Fitz Recreation Ground, Keswick.**—The Committee of the Fitz Recreation Ground announce that they have arranged for the purchase of twenty-seven acres of land for the sum of 6,800l.



# THE NEW CHURCH OF THE ORATORY AT BROMPTON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last some seventy or eighty members of the Architectural Association visited this important building, which has now made considerable progress. The visitors were received and conducted over the building by the architect, Mr. H. A. K. Gribble (with whom is associated in the work Mr. J. T. Walford).

Mr. Gribble, after the visitors had looked at the plans and drawings, explained that the nave is 51 ft. wide, and will be groined throughout in cement concrete, composed of the best Portland cement and Portland stone chippings. No slag would be used in it, nor any iron ties. Although slag is a valuable ingredient in concrete, possessing as it does valuable binding properties, it is not thought advisable to use it, seeing that the ceiling is to be very elaborately decorated, it being thought that the iron contained in the slag would be likely to give very serious trouble by injuring the decorations. The aisles are 30 ft. wide, having solid walls running up to a height of 50 ft. The number of chapels is nine or ten. On entering by the main entrance the first chapel on the left-hand side is dedicated to the Sacred Heart. The one opposite to it on the right-hand side is the Chapel of St. Patrick. Beyond this, on the same side, is the Magdalen Chapel, the altar of which is to cost 1,100*l.*, and is already in the hands of the sculptor. Opposite to this chapel is the Chapel of St. Joseph, which has a small apse, and is surmounted by a cupola. This will be the most perfectly-lighted chapel of the whole series, because it has window lights on each side, in addition to the cupola above. Next to the Chapel of St. Joseph is the Chapel of the Seven Dolours, which has two small quadrants at the end. The space behind one of these is utilised as a lobby, and that behind the other one is used for lydrants, hose, buckets, and other appliances for guarding against damage by fire. The altar for this chapel, which will be placed in a recess between the two quadrant corners, is also in the hands of the sculptor, and is to be given by the Duchess of Norfolk. On the opposite side of the nave what would otherwise be wholly used as a chapel is set apart for the organ, which will be placed in a gallery, beneath which will be a Calvary chapel. The space for the organ, although not quite so lofty as Mr. Gribble could wish, will have three large openings into the church, one into the north transept (which will be the Lady Chapel), one into the nave, and the third into the Magdalen Chapel, already mentioned. The gallery supporting the organ is constructed of rolled-iron joists supported on cast-iron stanchions. The walls of the organ-chamber will be lined with American walnut. Mr. Gribble had at one time intended to use stone, but he feared that the effects of the reverberation would be disagreeable, so he had changed his intention. The organ-gallery is kept at a higher level above the floor than would otherwise be necessary in order to allow of sufficient headway in the aisle beneath it for processional banners, &c. The south transept will be dedicated to St. Philip Neri, the patron saint of the Oratorians. The altar will be in foreign marbles, and is estimated to cost five thousand guineas, exclusive of two of the marble figures. The north transept will be the Lady Chapel, and the altar for it is in course of restoration by Mr. Rudcock. It is a very fine specimen of inlaid Florentine marble work,—perhaps, said Mr. Gribble, somewhat debased in style, its date being 1693. It comprises several marble figures of heroic size, stands 40 ft. high, and was purchased by one of the fathers of the Oratory from a church in Brescia, which was about to be pulled down. Entered from the Lady Chapel is the Chapel of St. Wilfrid. The sanctuary or chancel measures about 75 ft. in length by 50 ft. in width,—1 ft. less in width than the nave—and it has a height of 82 ft. to the ceiling. The semi-dome over the apse has already been commenced, the two lower rows of coffers being executed in brickwork, while the upper part will be in concrete. The great dome, which will cover the intersection of the nave, transepts, and sanctuary, will be entirely in concrete. The piers supporting the arches of the nave are each faced with grouped pilasters of beautiful marble from the Radford quarries, near Plymouth. There will be several sacristies. The principal one is approached from the sanctuary and from the south transept, and in

it will be kept the costly vestments of the priests, and special precautions have been taken to secure dryness. The walls will be panelled for a height of about 10 ft. in walnut inlaid with boxwood, and in front of this paneling a series of presses will be ranged round the room. The upper parts of the walls of this apartment contain a series of lunettes which it is proposed to fill in with figure-subjects illustrative of the history of the church. This sacristy has a small apse, in which will be placed a marble altar.

We may on a future occasion give some further particulars of the building.

## CONCRETE SEWERS ABROAD.

THE construction of concrete drains is increasing yearly on the Continent, notwithstanding the competition of earthenware pipes. These drains are made in two ways. Either concrete pipes or drain-pieces are joined by concrete-mortar, or the mould of the drain is put up on the spot, and concrete rammed round it into the soil. Although the latter mode of proceeding is the cheapest, and possesses besides the advantage of homogeneity and better conditions of drying, the erection of the mould, and especially obtaining an accurate angle of fall at small gradients, offers no slight difficulty. After removing the mould or centring, moreover, the inside requires attention, if the whole is to be finished off carefully.

These difficulties have induced Herr J. Chailly, of Vienna, manufacturer of concrete goods, who distinguished himself as a member of the Austrian committee appointed to fix a concrete standard, to construct centring for concrete sewers by means of which the desired form of section, and the inner surface of the drain, may be made so exactly and smoothly as to dispense with subsequent finishing off. The saving thus effected is said to be the least advantage, the principal one being that the sewer may be constructed with a degree of almost mathematical exactness, which insures a rapid draining off of fluids and prevents accumulation injurious to health. The apparatus recommends itself also on account of its cheapness, a length of only 6 ft. being required; as soon as that length of drain is completed, the apparatus is withdrawn, and a fresh piece begun. The time taken in completing a length is three hours, so that in a working day of twelve hours about 25 ft. may be made. The concrete being rammed into the soil, and thus becoming closely connected with it, settlements and cracks are out of the question. It is claimed for the apparatus that the mould being firmly fixed, it does not move even during the operation of ramming the concrete, while with other systems it is shaken about, and it is impossible to maintain the same direction and an exact level. After the piece of drain is finished, the apparatus may be loosened easily and without friction, and moved forward. A number of concrete sewers have been made with Chailly's apparatus; for, instance, 20,000 ft. ran at Liez, as well as many drains at Vienna, Teschen, &c.

The construction of the apparatus is as follows:—It consists of a tube, the outer surface of which forms the inner surface of the drain. This tube is divided longitudinally into six or more parts or planks, the lateral divisions being of the same width throughout; the lower or bottom plank and the upper or vaulting piece only being wedge-shaped. The upper wedge must be, on the whole, narrower than the semi-circle of the vault, so as to enable the workman to detach it at the proper time from the concrete without pressure or loss of time. All the planks have smooth horizontal joints, and the tube formed of them is somewhat rounded off inwards, or drawn together at its front and back ends, so that its cross-sections at those places are somewhat smaller. This facilitates the insertion of the tube in front in a gauge-ring of the drain-mould, and behind in the completed piece of the drain; at the same time it adapts the tube for making slightly-bent drains. The lateral planks are jointed to the gauge-ring by means of conic tenons in projections of the same; the bottom plank is secured to the gauge-ring by two wedges. This gauge-ring cuts off the concrete to be brought in in such a manner that each new piece of drain is rabbeted to the piece last made.

The gauge-ring is adjusted by wedges, and at top and bottom by squares and plummets provided with exact marks. As the gauge-ring

must always be at a right angle to the axis of the drain, it will, owing to the fact that sewers have more or less of a fall, and are, as a rule, constructed from below towards the top, be not vertical, but hang over at the top. In accordance with this, a mark corresponding to the inclination is placed upon the lower square, and the plummet set upon it. The upper square is put upon the correct longitudinal direction of the drain by means of sighting rods. The withdrawal of the apparatus after fixing the gauge-ring is effected by first, and next securing it to the gauge-ring by means of the wedges mentioned, while, at the back, it is supported at the lateral planks still in the drain also by wedges. The lateral pieces are kept in their place by suitable wedge stays. As soon as the bottom plank is fixed the concrete is stamped in between the side and bottom plank by means of curved pestles, and levelled with radial joints. The lateral planks are then drawn forward in a similar manner, fastened, and stamped in with cement. The vaulting piece is then similarly dealt with. The vaulting slab is fixed to a carriage-like wheeled frame, which follows on withdrawal. The vaulting piece settles somewhat, but is lifted again on being fixed to the gauge-ring. Two gauge-rings are only necessary at the commencement of work. The carriage is then put inside the tube, and connected with lateral pieces, for which it has supports. These longitudinal pieces serve for fastening the wedge stays, which secure the lateral planks.

Various sections, but mostly of an egg shape, have been made with this apparatus. The sewers of Linz are constructed of concrete of a thickness of 8 in. at the bottom, 5 in. at the sides, and 5 in. at the crown, and they have an inner height of 3 ft. 8 in., and a greatest width in the upper quarter of 1 ft. 9 in. The concrete used for them consisted of one part of Portland cement, one part of Kufstein cement lime, four parts of sand, and four parts of gravel. The municipality of Vienna has all the sewers of the city constructed after this method. The concrete used for the bottom consists of one part of Portland cement, three parts of sand, and seven parts of broken stones; that for the lateral portions of one part of cement lime, two parts of sand, and two parts of broken stones.

## PROPOSED METROPOLITAN LEGISLATION.

THE Bill promoted by the Metropolitan Board of Works for the amendment of certain portions of the Metropolitan Local Management Act and the Building Act, is appointed to be read a second time on March 3rd, when it will in all probability be referred to a select committee.

The short title of the Bill is Metropolitan Management, Building, and Floods Prevention Acts (Amendment), and it is described as a Bill "to confer further powers upon the Metropolitan Board of Works with respect to streets and buildings and the protection of the metropolis from floods and inundations caused by the overflow of the river Thames."

The Bill is divided into five parts. The first part sets out the short title and defines the limit to which the Act shall extend, which is to be the Metropolis as defined by the Local Management Act of 1855; the second part relates to the laying out of streets, frontages of buildings, and theatres; the third part deals with certain amendments of the Building Act; and the fifth part treats of the penalties to be imposed for infringements of the Act, and exempts certain buildings and localities from its operation.

By the 5th clause of the Bill the Board propose to take power to carry out alterations in the naming and numbering of streets in the case of the default of any vestry or district Board to put in force any order made by the Board. The 87th section of the Metropolitan Management Amendment Act, 1862, gives the Metropolitan Board power to authorise alterations in the naming or numbering of streets, but the carrying out of such alterations is left to the local authority, and there is no remedy under the existing law in case the local authority declines to carry out the order of the central body.

The 6th clause imposes a penalty not exceeding 10*l.*, and a further penalty not exceeding 40*s.* a day for every day the offence is continued, upon every unauthorised person who places any fence, bar, obstruction, or encroachment, in any street so as to impede the traffic. It would appear from this clause that the present law has



been found ineffectual to prevent obstructions of this kind in public thoroughfares.

The 7th clause is a very important one, and if it should become law will confer very large powers upon the Metropolitan Board, and will considerably affect the laying-out of building estates. As the law stands at present, any person desirous of building can give the Board notice of his intention to lay out any street or footway, such notice being accompanied by a plan and section of the proposed street or footway, and provided the proposed street be not less than 40 ft. wide and the footway not less than 20 ft. wide, and that the street or footway have two entrances open from the ground upward, the work can be lawfully carried out at the expiration of six months from the date of the notice without the approval of the Board.

In the Bill now before Parliament it is proposed, in case where it is intended to lay out a road, passage, or way for building, in such a manner as not to afford direct communication between two streets, to give the Board power to prevent such road, &c., being made without the approval of the Board; or the Board may approve of the laying-out subject to such conditions as they may think fit to impose.

Section 8 restricts the laying-out of streets for foot-traffic only, and proposes to confer power upon the Board to prevent the formation of such streets in case the Board should consider it inexpedient, or to approve of such streets being formed subject to certain conditions.

The 9th clause is intended to extend the powers of the Board under the 75th section of the Metropolitan Local Management Amendment Act, and to enable the Board to impose and enforce conditions with reference to the space left in front of buildings erected in advance of the general line of buildings. This clause would appear to apply chiefly to shops built upon forecourts, and to be intended to prevent the objectionable practice of exposing goods in front of such shops. The law will of course only apply to additions made after the passing of the Act; but it will be to some a matter for regret that the law cannot be made retrospective.

Clause 10 proposes to give the Metropolitan Board the same powers as are conferred on Vestries and District Boards by the 75th section of the Metropolitan Management Amendment Act, 1862, with respect to buildings erected beyond the general line of buildings. At present no building can be erected beyond the general line of buildings in any street or row of houses without the consent of the Metropolitan Board of Works; but the Vestries and District Boards alone have power to initiate proceedings in case of infraction of the law, so that if the consent of the local authority be obtained, the central and assumed controlling authority is powerless to interfere. The 10th clause of the Bill is intended to remedy this anomalous condition of the law and to give the Metropolitan Board of Works and the Vestries and District Boards concurrent jurisdiction.

The 11th clause proposes to give the Board extended powers over theatres and music-halls, to enable the Board to direct the doors of these buildings to be kept open, the manner in which they shall be fastened, and also to cause notices to be posted specifying the means of exit. In view of the lamentable fatalities that have recently occurred in theatres, it may be safely assumed that there will be very little opposition to these very moderate amendments of the law.

Clauses 12, 13, and 14 relate to the prevention of floods from the river Thames, and will enable the Board to authorise the continuance of temporary flood works in case the erection of a fixed dam would materially interfere with the transaction of business.

The 16th and 17th clauses deal with iron or other buildings of a temporary character, and give the Board power to approve of such buildings for a limited time, and to impose conditions requiring their removal within a certain period. It would appear from this clause that the Board has, at present, no power to approve of temporary buildings under the 56th Section of the Building Act.

The 18th clause is intended to restrict the stacking of timber within 30 ft. of a highway without the approval of the Board. This portion of the Bill was opposed by the timber trade, and is understood to have been withdrawn by the Board in deference to the remonstrances of the persons chiefly interested.

The 19th clause gives the Metropolitan Board power to authorise the construction of ware-

houses or other buildings used for trade or manufacture of a greater size than 216,000 cubic feet, to which such buildings are at present limited by the Metropolitan Building Act. This proposal had excited the susceptibility of the insurance offices, who object to the proposed alteration; and a deputation has been appointed to attend, and to place before the Board the objections of the offices to the suggested relaxation of the restrictions imposed by the 3rd sub-section of the 25th section of the Building Act.

In the abortive Bill of 1874 for the amendment of the Metropolitan Management and Building Act it was proposed to permit the construction of buildings of a greater size than 216,000 cubic feet without being separated by party-walls; but the maximum contents were not proposed to be allowed to exceed 300,000 cubic feet without the consent of the Metropolitan Board. The Select Committee to which the Bill was referred reported to the House of Commons that it was not desirable to fix any limit as to cubical contents in buildings other than warehouses, the proviso seeming to imply that the Committee were of opinion that it is desirable to limit the capacity of warehouses and trade buildings; but this is not quite clear, nor is it easy to ascertain the meaning of the form in which the recommendation of the Committee is framed, seeing that it was not proposed by the Bill to place any restriction upon the size of buildings other than warehouses.

Captain Shaw, in the evidence given by him before the Select Committee in support of the Metropolitan Board's Bill, in 1874, gave it as his opinion that the old limit as regards the size of warehouses was preferable to any increase. The Secretary of the Royal Insurance Company, who was called by the Board to give evidence in their favour, acknowledged, in cross-examination, that he looked with very considerable apprehension upon the proposed extension of the limitation as regards capacity from 216,000 to 300,000 cubic feet, and that he regarded the suggested amendment not as an improvement, but a decided deterioration. A similar opinion was expressed by the then manager of the Commercial Union Insurance Company.

By the 20th clause it is proposed to increase the size of the open areas required to be provided by the 29th section of the Building Act, the minimum being proposed to be 150 square feet at the least for buildings with a frontage not exceeding 15 ft., and increasing according to the extent of the frontage to a maximum of 450 square feet. It is not proposed by the Bill to prohibit this open space being built upon on the ground-floor.

The 21st clause provides that when any building is converted into a public building it shall be constructed to the satisfaction of the district surveyor; and the provisions of the 30th section of the Building Act are to apply as if such alteration or conversion were a public building. This appears to be a very important and necessary amendment.

Pipes conveying hot-water at low-pressure are proposed by the 22nd clause to be exempted from the operation of the 21st section of the Building Act.

Under clause 23 the Board are to be empowered to deal with ruinous, dilapidated, and neglected structures, and may, on obtaining a magistrate's order, require the owner, or in default the occupier, of such structure, to take down, repair, or rebuild it to the satisfaction of the Board. This clause appears to have been introduced to meet the case of such buildings as the neglected houses in Stamford-street and Argyll-street, Regent-street. A similar provision was contained in the Bill of 1874.

Clauses 24 and 25 have reference to dangerous structures. By clause 24 it is proposed to prevent the site upon which a dangerous structure stood, which has been pulled down by the Board under a magistrate's order, being again built upon until the costs and expenses of the Board with regard to such dangerous structures have been paid.

Clause 25, which consists of only three lines, is nevertheless a very important one. It provides that proceedings taken with regard to any irregular building shall not be prejudiced by the removal or falling in of the roof of such building. In the absence of any definition of a building in the Building Act, magistrates have generally accepted the interpretation that everything having a roof is a building, and when proceedings have been commenced with regard to an irregular building, and the defendant has

removed the roof, a magistrate refuses to convict, and the proceedings thus come to an end.

The 27th clause seeks to remedy the omission in the Building Act with respect to arbitration between the building owner and the adjoining owner as to party-walls, which at present enables the adjoining owner practically to nullify the clear intention of the Act.

The royal palaces and all buildings, works, and grounds exempted from the operation of the Metropolitan Building Act, 1855, are exempted from the operation of the Amending Act. This seems only reasonable, but it is difficult to see why the Temple, Gray's Inn, Staple Inn, Furnival's Inn, and the close of St. Peter's, Westminster, which are not excluded from the older Act, should have exemption from the Amendment Act.

#### THE BATTLE OF CHÆRONEA.

EXCAVATIONS at a distance of five miles from the modern Greek village of Kapraina have led to some interesting discoveries. The ancient name of the place in question was Chæronea, and it was there that, on August 4th, B.C. 338, the Greeks were defeated by Philip of Macedon and his formidable Macedonian phalanx. On that fatal day 300 Thebans of the so-called "Sacred Band" fell and were buried on the battle-field. Some time ago, M. Stamatakis, the head of the excavating party, came upon the remains of these warriors. Further diggings have led to the discovery of a parallelogram, made by two walls 25 metres long, and two others of 10 metres, the depth of all being 2 metres. The rectangular space thus enclosed is found to be the grave of the Theban warriors. At a depth of 4 metres the excavators came upon the remains of 185 Thebans, all lying in regular rows and layers, besides the remains of forty more bodies, lying close together, in less regular order. There have been seven rows of the brave Thebans discovered so far. They are placed so that the heads of one row are on the feet of that beneath. All the remains show the traces of terrible wounds. One skeleton shows both the thigh-bones shattered with the lance; another, the lower jaw carried away; another, the skull fearfully crushed. No weapons have been found, the victors having taken them away as trophies. Among the remains there have, however, been discovered a number of bone buttons, with a hole in the middle; likewise several terra-cotta dishes, each with two handles. The excavations are being continued, with a view to find the remains of the rest of the Theban phalanx.

#### BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE fifteenth annual general meeting of this Institution was held on Tuesday evening last, at the offices, 27, Farringdon-street, Mr. Arthur C. Lucas, President-elect, in the chair, supported by Messrs. Howard Colls, Thomas Stirling, B. C. Fox, T. H. Winney, E. O. Rowe, W. Seymour, E. Brooks, G. Bugg, J. Robson, J. Allwright, W. A. Rhodes, and H. T. Bayes (treasurer).

The report and balance-sheet, read by the secretary (Mr. H. J. Wheatley), were of a satisfactory character. The income from all sources during the year ending the 31st of December last amounted to 536l. 18s. 1d., comprising 277l. 1s. 7d., made up of annual subscriptions and dividends, and 259l. 14s. 6d. donations given at the annual dinner, under the presidency of Mr. Stanley G. Bird. On that occasion the claims of the Orphan Fund were strongly urged, and of the total amount announced in response to Mr. Bird's eloquent appeal the sum of 214l. 11s. 6d. was, at the wish of the donors, devoted to this fund. Referring to this fund, the report states that of the two children who were the applicants for its benefits at the time of the dinner, one proved on investigation to be ineligible, and the second one was otherwise provided for, thereby rendering it unnecessary to purchase a new presentation as proposed. Of the sum subscribed, however, 200l. had been invested and placed to the credit of the Orphan Fund. With respect to the Relief Fund, the expenditure under this head (262l.) slightly exceeded the income, and it was earnestly hoped that fresh subscribers would be forthcoming, so that the usefulness of this important fund might not be impaired. There was a vacancy for one



pensioner, but there were nine pensioners on the books of the Institution, at whose cost also two children were being maintained and educated at the Orphan Working Schools. During the year several applications for temporary relief had been considered, and assistance promptly granted. The Committee had received information that a legacy of 100*l.* had been bequeathed to the Institution by the late Mr. William Ward, of Brixton Hill, uncle of the esteemed founder of the Institution. This was the first bequest which had been made to the society. During the year, the Committee had devoted a large amount of time to the consideration of the proposition (brought forward by Mr. Rider on the occasion of the annual dinner) for extending the operations of the Institution over the country, but they had not yet been able to take any practical steps in the matter. In conclusion, the report expresses the thanks of the Committee to the retiring President, Mr. Stanley G. Bird, for his liberality and great personal exertions on behalf of the charity during his year of office. In addition to the handsome sum received on the occasion of the annual dinner, there had been a further accession of clerks to the list of subscribers. The balance-sheet (duly certified by the auditors, Messrs. S. J. Thacker, Thomas Stirling, and Thomas Bishop) showed that the total income of the Institution for the year 1881 was (including a balance of 151*l.* 2*s.* 4*d.* brought forward from 1880) 687*l.* 13*s.* 5*d.* The subscriptions to the Relief Fund amounted to 187*l.* 19*s.*, and those to the Orphan Fund to 72*l.* 9*s.* The donations to the Relief Fund amounted to 32*l.*, and to the Orphan Fund to 200*l.* 8*s.*, the remainder of the income being made up of 43*l.* 19*s.* 7*d.* interest on invested fund. The total expenditure amounted to 600*l.* 8*s.* 3*d.*, leaving a balance in the bankers' hands of 187*l.* 10*s.* 2*d.* The expenditure included 205*l.* paid in pensions; 10*l.* in grants for temporary relief; 31*l.* 8*s.* 3*d.* for printing, advertising, rent of offices, secretary's salary, and other working expenses; and 202*l.* invested in stock (Now Three per Cent.).

The Chairman, in moving the adoption of the report and balance-sheet, said it had afforded him very great pleasure to accede to the request made to him that he should become president of the Institution, and though he felt it would be a difficult thing to successfully emulate the energy of the retiring president, he would do all in his power in any way to aid the Institution, which was one which should command the adhesion of all builders' clerks. He could not help thinking that, considering the great number of building firms in the metropolis employing clerks, the number of members or subscribers was not so large as it ought to be. He trusted that at the end of his year of office the Institution would show increasing prosperity.

Mr. Brooks seconded the motion, which was unanimously agreed to.

Mr. Howard Collis, in moving a vote of thanks to the retiring officers, made special reference to the services rendered to the Institution by the president for the past year, Mr. Stanley G. Bird, who had, unfortunately, been so unwell during the past three weeks that he was unable to be present on that occasion. Mr. Stanley Bird's services to the Institution had been very valuable. Few men took so deep an interest as Mr. Bird in the welfare of the building trade and builders' clerks. He would, no doubt, have a worthy successor in the person of Mr. Lucas.

The motion was seconded by Mr. Rhodes, and duly carried, and Mr. Thomas Stirling, as one of the retiring officers, replied.

Mr. Arthur C. Lucas was then elected president; Messrs. S. J. Thacker, Thomas Stirling, and Thomas Bishop were re-elected auditors; Mr. H. T. Bayes was re-elected treasurer; Messrs. Thomas Bishop, E. Brooks, G. Bugg, B. C. Fox, E. C. Roe, and T. H. Winney, were re-elected members of the committee, of which, also, Mr. T. C. Holding was elected a member.

The meeting was then made special for the election of a pensioner. There was only one candidate, viz., William Harfley, of Balham-hill, seventy-eight years of age, employed for forty years in the office of Mr. John Lost, builder, Balham. On motion duly made, seconded, and carried, Mr. Harfley was duly elected.

Mr. Bayes, in proposing a vote of thanks to the chairman, said it augured well for the Institution that Mr. Lucas had become its president. He took a deep interest in the Institution, and was a worthy representative of the

great firm whose name he bore,—a firm whose benevolence kept pace with its means.

The motion was seconded by Mr. Winney, and carried; and Mr. Lucas, in reply, thanked Mr. Bayes for the kind manner in which he had alluded to his father and uncle.

#### NORMAN STAIRCASE, CANTERBURY.

This Late Norman staircase, which we illustrate from a drawing by Mr. G. H. M. Addison, is one of our finest examples of transitional work. The beauty of the design is greatly enhanced by the rich tone which time has given the materials, and it forms by no means the least attraction of that architectural Eldorado, Canterbury.

#### A REMINISCENCE OF JOHN THOMAS, SCULPTOR AND ARCHITECT.

AMONGST our illustrations this week will be found *fac-similes* of sketches by the late John Thomas, whose works are to be seen in the royal residences at Windsor, Balmoral, and Buckingham Palace, in the mansions of some of our nobility, and in public buildings in many parts of the kingdom and abroad. He is, perhaps, best remembered, however, as the sculptor of the royal statues and stone enrichments at the new Palace, Westminster.

Many other drawings by Mr. Thomas, of much greater importance than those given herewith, are to be found, wherein his versatility in design and power of hand are more fully exhibited; but to those who had the pleasure of his personal acquaintance and friendship, these few outlines will serve as a slight memorial of one who was esteemed while living for the simplicity of his demeanour and the generosity of his heart, whilst the art-student of our present time,—many not knowing even his name,—may be induced to seek out and examine for himself the works of one who was "the right man in the right place, at the right time," and a worthy coadjutor of the illustrious architect who now reposes within the walls of the venerable Abbey, and in the shadow of his own great work.

Thomas was disinclined to and unaccustomed to prepare "show" drawings. He was, by the circumstances of life, a thoroughly practical man, and the enormous amount of work that passed through his hands could not have been executed had he bestowed much attention on the "get up" of his drawings. He was, therefore, generally content with sketches sufficient for the passing purpose, excluding anything beyond what was really required.

To the ever-increasing competition of late years may be attributed, in some degree, the desire of designers to spare no pains in the production of their drawings to captivate and satisfy the client's eye.

The over-very method and fashion of preparing architectural and decorative designs might furnish an interesting subject for an essay.

A visit to the Diploma Gallery at Burlington House (to those courageous enough to ascend the many stairs), where are designs by Soane, Wilkins, Scott, Hardwick, the Smirkes, the Barrys, the Wyatts, and, going back to nearly a century, the work of our John Yenn, clearly shows a great difference between the carefully-finished but somewhat feeble efforts of a few generations since, when compared with the vigorous but, in some cases, less minute drawings of more recent years.

Besides versatility, Mr. Thomas possessed in a marked degree other gifts necessary to success,—namely, industry and rapidity. As an instance of the latter, the writer of these lines well remembers on one occasion, during his pupillage, twelve large figures (cartoons for glass) being designed and completed by him during the interval of one evening.

Respecting his architectural and decorative designs, Thomas appeared to possess an inexhaustible fund of ideas,—he was never at a loss; but this power of originality was occasionally apt to induce him to bring together elements different in character, difficult to harmonise, and sometimes unhappy in effect.

Of recent years, where the rapid changes of style have developed freedom from precedent, such departures from the beaten track would pass unnoticed; but the devotee of art was more punctilious and exacting as to the "proprieties" a generation or two ago, and any form or detail differing from the prevailing method was subjected to sharp criticism.

As an architectural designer Thomas dealt most successfully with Elizabethan, and the chief buildings designed by him in this style, namely, Somerleyton Hall, Suffolk; and Preston Hall, Kent, show boldness and skill. With respect to the sister art of sculpture, it has been doubted if Thomas was gifted with that perception of refinement so necessary to the attainment of the highest position of this incomparable art, and sufficient to have enabled him to rise to the eminence of a Flaxman or a Foley. He was, indeed, too versatile with his accomplishments to have excelled in all. The calls upon his time and talent were so various and widespread that he could not for many years find that repose requisite to profound study; still it is evident that for some time previously to his death (being greatly influenced by the keen perception and refined taste of the Prince Consort) he was ambitious to produce works of lasting reputation: the Audience Chamber at Windsor may be mentioned as a noteworthy example.

One of Thomas's last efforts, viz., the colossal "Shakespeare" seated on a throne, supported by Tragedy and Comedy, seen at the International Exhibition, 1882, more recently at the Crystal Palace, and now in Aston Hall, Birmingham, is an effective design, though open to criticism. The pedestal is somewhat obtrusive, and detracts from the dignity of the group above.

That Thomas possessed considerable power the group alluded to fully exemplifies, and had he not been off in the prime of life, his subsequent designs, no doubt, would have exhibited an increasingly-refined character and expression.

The few sketches that go with these remarks are intended, as before stated, chiefly as a reminiscence. They are taken from designs for some of the Royal Arms with which the New Palace at Westminster is adorned,—the panel containing those of Richard III. being given in full; the other sketches will be recognised by students of heraldry. A few heads roughly sketched by Thomas are also added.

E. A. H.

#### BUST OF THE GERMAN EMPEROR.

It will have been noticed that we have taken occasion for some time past to place before English readers representations of commemorative and monumental sculpture executed abroad, and essays on various departments of the sculptor's art, supplied in all cases by men thoroughly conversant with the art, its wants, and its difficulties. Our purpose is obvious, and we have reason to believe the course taken has not been without effect. In our present number we add to our already long series of modern foreign monuments and commemorative groups a bust of the Emperor of Germany, with accessories, designed on the occasion of the Kaiser's last birthday, by Herr Eberlein.

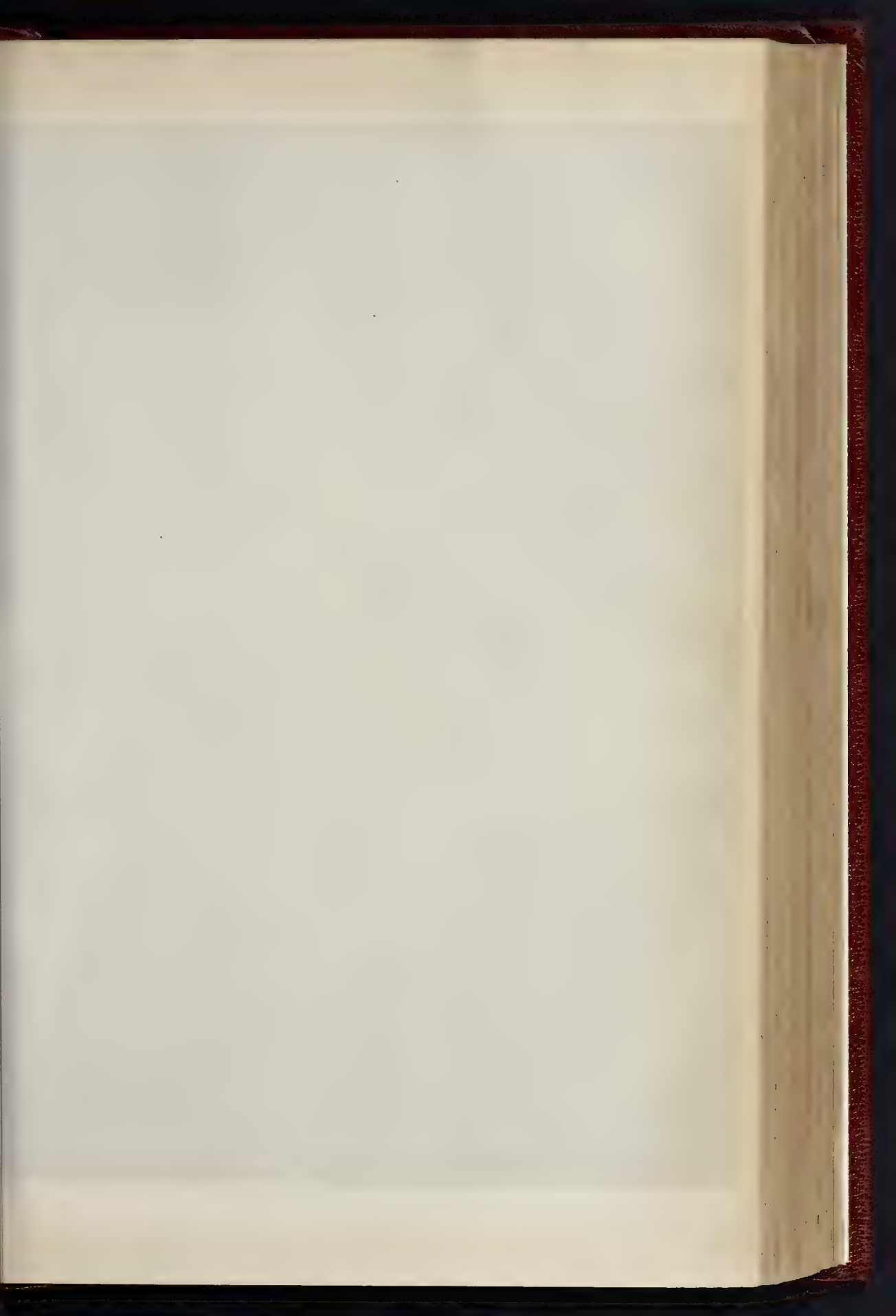
Amidst a surprising amount of discontent amongst certain sections of the people, and the absence, to some extent, of those signs of material progress in Germany which might have been expected, artists are never tired of doing homage to the Emperor. Mr. Eberlein thus apostrophises the Kaiser on the pedestal of his bust:—"Father of the people and augments of their fame, ruler of the Empire, full of the highest heroism,—reverent love and adoration have for ever engraved thy image upon the hearts of thy people!"

#### THE BUSH INN, HUDDERSFIELD.

This structure is about to be erected for Mr. William Taylor. The materials are brick and red terra cotta. On the first floor, above the bar, is a billiard-room, facing the main road. On the right is the smoke-room, above the commercial or coffee-room. At the back is a yard enclosed by stabling and servants' rooms. The architect is Mr. B. H. Stone, of Liverpool. Tenders have not yet been invited.

**Utilising Waste Power.**—At Hatfield Park, the seat of the Marquis of Salisbury, the piles to support a coffer-dam across the river Lea have just been successfully driven by the power from a water-wheel situated at a distance, which power was transmitted by two dynamo-machines and a couple of wires to the gearing connected with a pile-driver of ordinary construction erected on a barge floating in the river. The machinery, although rather roughly constructed, worked well, lifting a dolly weighing from four to five hundredweight with ease and regularity.







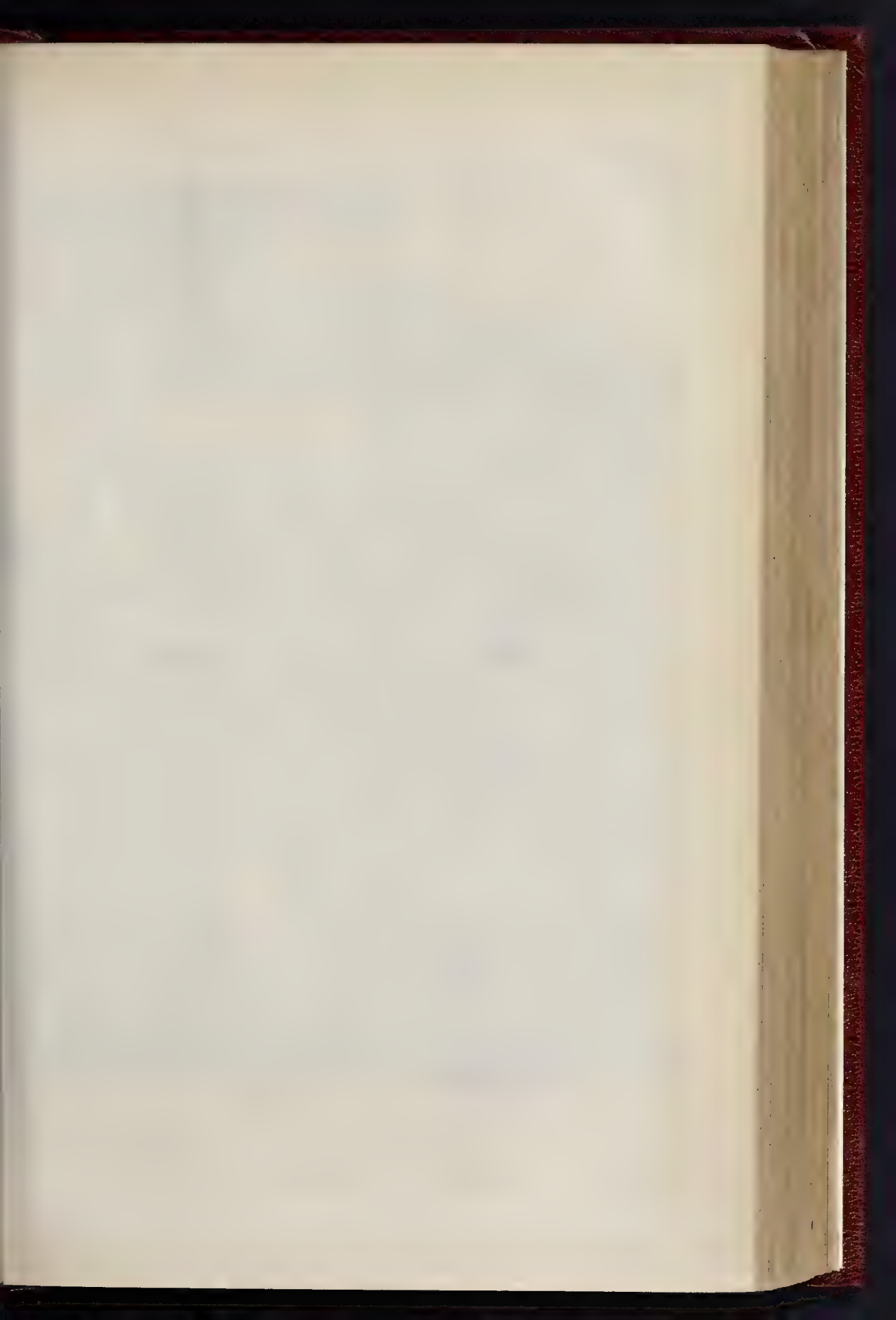




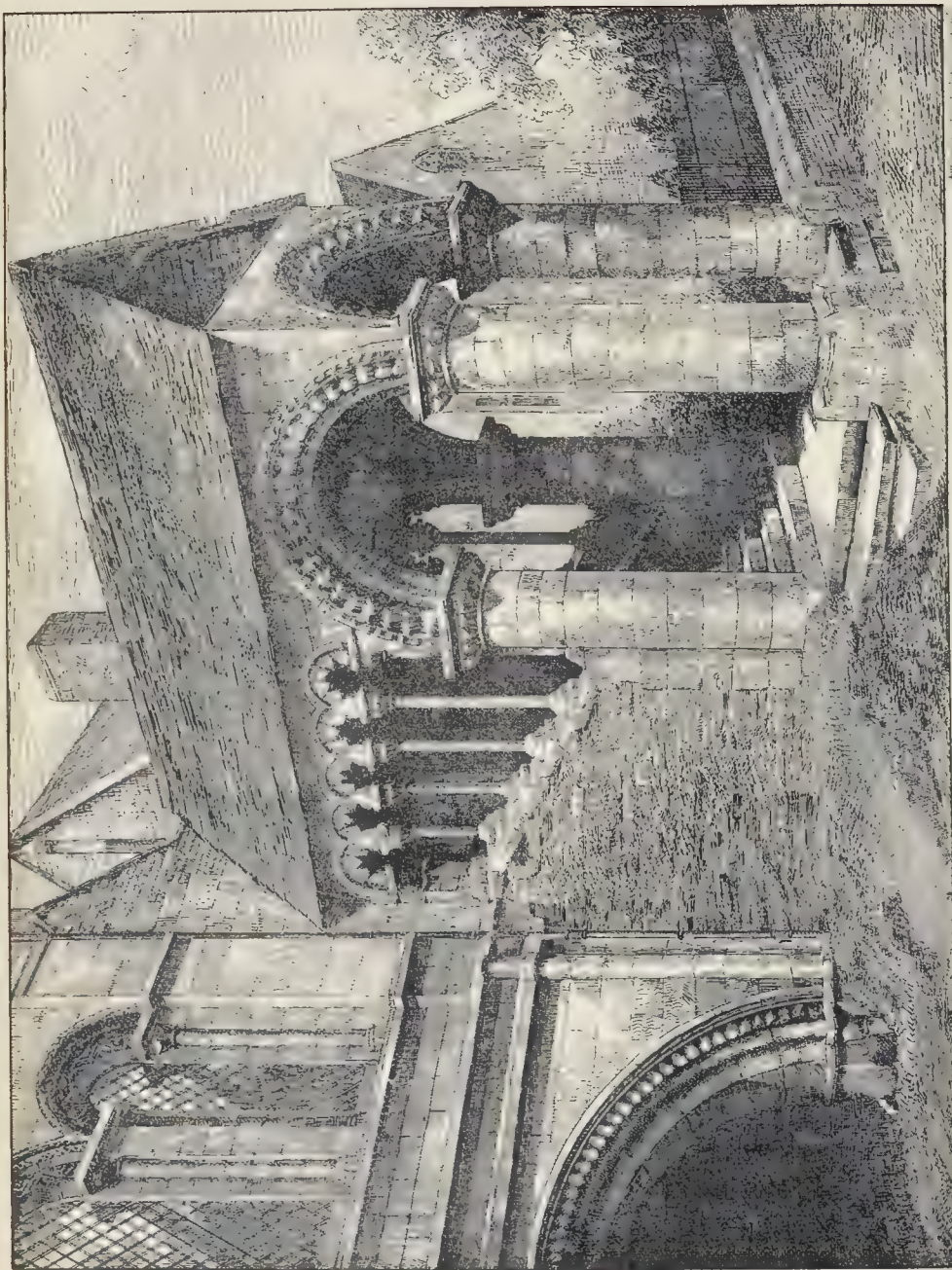
DESIGN FOR A BUST OF THE GERMAN EMPEROR.—By G. EBERT, SCULPTOR.





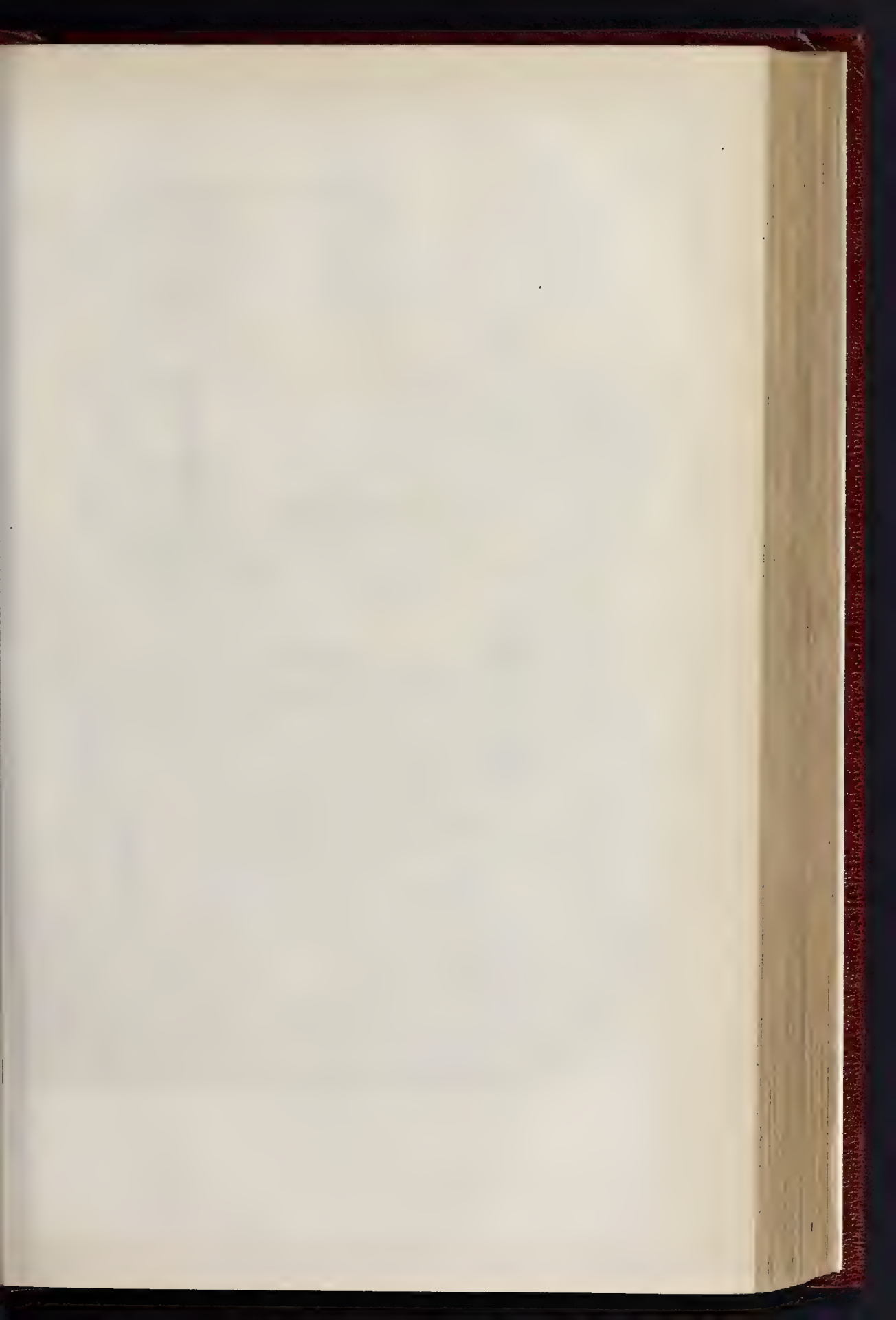


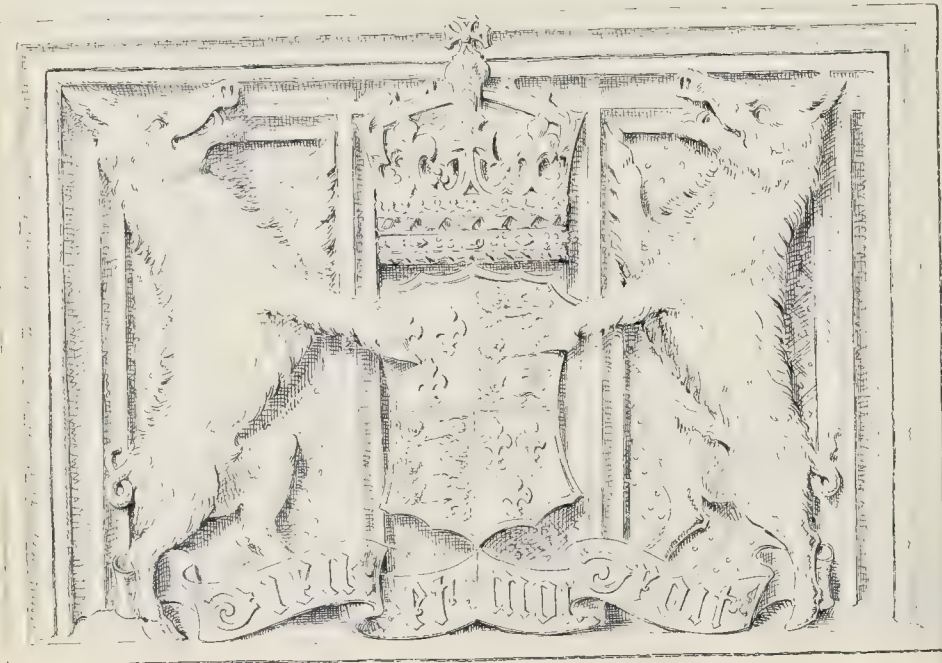
THE BUILDER MARCH 4, 1882



THE NORMAN STAIRCASE, CANTERBURY.







Richard III.



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SKETCHES BY THE LATE MR JOHN THOMAS, SCULPTOR AND ARCHITECT.





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SKETCHES BY THE LATE MR. JOHN THOMAS, SCULPTOR AND ARCHITECT.







THE BUSH INN, HUDDERSFIELD. —MR. B. H. STONE, ARCHITECT.





## PHYSICAL SCIENCE IN RELATION TO ARCHITECTURE.\*

ANALOGOUS to the motion of fluids is the motion of the air, and upon a correct knowledge of the laws regulating this motion a great deal depends. Although the fact that air is an elastic fluid, ponderable, and subject to the action of natural forces, has been known for many years, it is only comparatively recently that this knowledge has been turned to account in relation to architecture, and that really scientific schemes of warming and ventilation have been devised. Even within our own recollection it used to be considered quite enough to provide an outlet for foul air, and if it was found practically that the foul air refused to avail itself of the outlet, the fault lay in the "nature of things," and the architect and builder were perfectly free from blame. But as soon as it was clearly understood that, after a maximum has been attained, it is just as impossible for air under ordinary pressure to make its way into a room, as for a vessel of a certain size to contain more than a certain quantity of water; or that no matter in what position an opening from an inner apartment into the external air exists, if the temperature of the apartment be higher than that of the external air, the cold air will have a tendency to rush in, rather than the hot foul air to go out,—as soon, I say, as these facts were appreciated, it became easy to lay down simple rules of ventilation, which rules have lately been applied with much success. If mechanical means of drawing away the foul air are provided, the place of the air that is drawn away must be taken by fresh air, and it is only necessary to arrange the inlets carefully, and see that the incoming air is not contaminated, to insure good ventilation. To take another instance, which was forcibly brought home to us all by the terrible Tay Bridge disaster, the pressure of air in motion,—that is, of wind,—on the roofs of buildings, is a subject well deserving scientific study. Fortunately, in this country, we have not to take such excessive precautions against wind as in other climates; but the inconvenience and danger caused by a high gale in London are very serious, and it is probable that a little extra care would make all roofs much less likely to be stripped by the wind than is now the case. The effect of a gale of wind acting upon a sloping roof is twofold; it never strips off tiles or slates at once, but any gust of wind of exceptional force is followed by a momentary vacuum, during the existence of which the atmospheric pressure inside the roof is greater than that outside, and this being the case, the tiles or slates, if simply nailed to battens, are lifted at the weakest point, their edges, when a following gust strips them off. If this theory is correct, it follows, as a matter of course, that tiles or slates tightly nailed to close boarding must be much better able to resist the interior force tending to lift them up than if only nailed to battens. This turns out practically to be the case. There is only one other matter in connexion with the air that I would mention, and that is, that the state of the air in any building materially affects its acoustic properties. Researches and experiments made by Professor Tyndall and others have proved beyond question that the waves of sound are most interfered with when they have to pass through strata of varying densities, and hence there is no doubt that the more effectually we ventilate our public buildings the better will their acoustic properties be. A knowledge of the scientific principles which govern the transmission of sound will enable us to prevent the passage of sound through walls, which is one of the greatest annoyances that dwellers in terraces have to put up with, and if the habit of living in flats should increase, this question will become even more important. I have frequently been struck with the small effect pugging under floors has in preventing sound being heard in the lower rooms, and this is because the pugging is nearly always too tightly packed. Any loose substance, such as sawdust or soft hair felt, in which the vibrations of the air lose themselves, and get broken up, would have far more effect; and it would not be a difficult matter to arrange party-walls so that they should be absolutely impervious to sound. Optics is another branch of science that immediately affects us, as the laws of the incidence and reflection of the rays of light must govern the size, and more par-

ticularly the exact position, of windows in any building, and in town architecture the value of a building depends very largely on the amount of light obtained for the various rooms.

I must now say a few words on the subject of that combination of the various branches of science to which I have already alluded, known as *Sanitary Science*. This was announced to us a few years ago as a new gospel, but it emphatically is nothing more than a knowledge of Nature's laws. This subject has been treated so exhaustively at the Institute within the last twelve months that I shall not occupy your time to any extent this evening upon it. Sanitary science is a striking example of the way in which all branches of physical science are allied to and bound up with one another. As was remarked by an eminent scientific man a few years ago,—“No science is so little connected with the rest as not to afford many principles whose use may extend considerably beyond the science to which they primarily belong,” and no one can possibly tell how our common every-day household arrangements may be affected by any new discovery in science, remote as it may appear at first. Nothing could have seemed less likely to affect house-planning and the sanitary arrangements of a building, than the researches of an eminent French chemist into certain diseases of animals, and yet it is upon the discovery of M. Pasteur that these diseases were caused by the presence of minute germs in the atmosphere, which upon finding a suitable nidus became active death-bearing organisms, that the whole germ-theory of disease rests; and this theory, as soon as it was proved to be scientifically accurate, gave the clue to the cause of that fatal disease typhoid fever—a disease which modern civilisation, in the shape of extensive systems of drainage, rendered more fatal than it ever has been before, because it made its approach more insidious. Dirt and filth of all kinds are perceptible at once, and can be easily removed; but sewer gas, which will find its way into a house, however clean it may be kept, unless certain precautions are taken, is a far worse enemy; but this enemy can now be attacked with a certainty of success, the precautions necessary to be observed to prevent its entry into our houses being perfectly well known and easily carried out. Until, however, it was known that this sewer-gas brought with it the germs which caused typhoid fever, all attempts at improving our system of drainage were abortive, because no one knew what had to be guarded against. The condition in which a number of large houses in the West End are now, or were till very recently, is a striking proof of the evil that may be done through want of accurate scientific knowledge. There can be little doubt that without ventilation of the drains, and the cutting-off of all house-drains from the main sewers, an elaborate and complicated system of drainage, like that of lethal engine that could be devised, and that we are now able to escape from it is solely due to the progress of physical science. As I have already referred to that part of sanitary science which relates to ventilation, I need not allude to it further; but I must say a word or two as to *Warming*. Now the phenomena of heat are a great deal more complicated than many people suppose, and if I were to attempt to explain the scientific principles involved in the transmission of heat, I should most probably lead you astray in a fog of my own creating; but if any one wants to investigate the subject for himself, he cannot do better than consult that admirable text-book on the theory of heat by Clerk-Maxwell. It is, however, only quite recently that these scientific principles have been recognised in the manufacture of stoves; but the Smoke Abatement Exhibition has doubtless done much good in this respect, as it has led people to think about the best mode of combustion, and the best method of radiating heat. Recent investigations have shown that light and heat are one and the same thing, but perceived by us through a different channel, and the “theory of exchanges,” as it is called, explains why we use polished silver for a teapot, lampblack for stoves, and why we whitewash the roof of a house to keep it cooler in summer, though it is not generally known that the same application tends to keep the house warmer in winter by diminishing its power of radiation. While on this subject I will briefly refer to one very important fact. If the air through which radiant heat passes be perfectly pure, it is almost completely

diathermanous; that is, it does not get heated itself, although it transmits the radiations; but the more impure it becomes, the more it stops the radiations, and takes up heat itself. Hence, the purer we can maintain the air in any place of assembly, and the freer from dust, the less effect will the heat which is being radiated into the room have in raising the temperature of the air itself. This shows the great desirability of filtering by means of horse-hair, wadding, or something of that sort, all the air which passes into a room through the ventilating openings.

I have left to the last that branch of physical science the practical developments of which are of most recent birth, and yet which bids fair to be of the greatest importance to mankind, and some knowledge of which will soon be a necessity for architects: I allude to *Electricity*. Although it is many years since the phenomena of electricity were first observed, and their wonderful character commented on, it is only within the last few years that its properties have been turned to practical account; but lately the progress has been so rapid that there can be little doubt we are on the brink of a more gigantic revolution than the one effected by the invention of the steam-engine in its practical form rather more than a hundred years ago. The number of points at which our work is brought into contact with the inventions of electricians is increasing daily. A few years ago electric bells were about the only things in connexion with houses that called for any knowledge of the subject, and these were generally looked upon as expensive toys; but there are now so many different patents for electric bells, and the simplicity of the system is becoming so widely known and appreciated, that I suppose there are few of us who have not been consulted on the subject by clients, and a slight acquaintance with the principles involved, enabling us to form an opinion as to the probability of a battery lasting, as to the good or bad method of insulating the wires, and various other points, is very desirable, otherwise we are completely in the hands of the men whom we employ, and are unable to exercise the slightest supervision over the work. But the subject that is now engrossing so much attention is the lighting of houses and shops by electricity; and you may be sure that before long the question as to the best method of artificially illuminating the new buildings we design will be one that every architect will be expected to give an opinion upon. Electric light systems are divided into two great branches,—the arc-light system and the incandescent systems,—and the question as to which is the more suitable in any particular case will have to be decided according to the conditions which have to be complied with in that case: hence some knowledge of the advantages and drawbacks of each system is essential. Before leaving the subject of electricity, I may mention the report, recently printed, of the Committee on Lightning Conductors, which is a good example of the benefit arising from a combination of scientific with architectural knowledge. Any one who carefully studies that report will gain a knowledge of the subject that it would have been absolutely impossible to acquire before its publication.

Let me now mention a matter which appears to me of considerable importance to our profession, but which I can only glance at now,—and that is, the preliminary education of an architect. I have a very strong opinion that the majority of architectural students leave school too early. We call ours a profession, and rightly so, as it is one of the most honourable and arduous of professions. If a boy is destined for the profession of Law or Medicine, not only is he kept at school till he is eighteen or nineteen years of age, but in nine cases out of ten, he has, in addition, a university course, if not at one of the older universities, at such institutions as University College; but it is no uncommon thing for boys to be articled to an architect at fourteen or fifteen years of age, before the preliminary education can possibly have been completed; and I believe the results of this system are altogether bad. No amount of after-study can compensate for the loss of the two or three years at school or college after the age of sixteen. The compulsory Examination recently set on foot by the Institute will, I hope, do much to obviate this, and I should be glad to see the scheme of examination framed so as to offer a premium for having passed certain public examinations. For example: that candidates who have passed the senior Oxford or Cam-

\* Paper read by Mr. J. Slater, B.A., before the Architectural Association on the 17th ult. Continued from p. 234.



bridge non-gremial, or the London matriculation, should be exempted from taking certain simple scientific and literary papers that would otherwise be compulsory, and in this way I believe much good might be done. I have endeavoured to show in how many ways a knowledge of physical science may be of advantage to an architect, and I can quite imagine that some such objection as this has occurred to your minds while I have been speaking: "Granting that such knowledge would be beneficial, still the range of subjects is so vast that it would be impossible to gain a thorough acquaintance with them." This I fully admit; but my point is, that a slight acquaintance with these subjects is much better than none at all. As was pointed out by Dr. Siemens some few months ago, a little knowledge is not a dangerous thing under certain conditions: these are that the little knowledge be well digested, and that its limits be kept always clearly in view. Although it may seem paradoxical to say so, yet it is a fact that a little knowledge of a subject will often enable a man to see clearly that he knows nothing at all about certain branches of that subject; whereas, if he had no knowledge at all, he might think he knew all about it. There are so many matters closely allied to architecture which are daily becoming more and more important, for which supplementary contracts are obtained, that if we are absolutely ignorant of them, we are wholly at the mercy of the individuals who are employed to do the work, so that I do not think any one should be deterred from gaining a slight acquaintance with scientific subjects because of the impossibility of mastering them. Just as a slight knowledge of a language will not enable us to go at once and read the books written in that language, but will, at any rate, help us to verify a quotation; so a slight knowledge of science will assist us to understand somewhat of its language, and, most important of all, will prevent our being the victims of gross deception. I remember hearing a friend of mine, who has had a thorough scientific training, once make a remark which struck me as being a very forcible one. He said,—"There are a great many branches of science that I know nothing about, but I will defy any man to talk nonsense to me on any scientific subject whatever for five minutes without my finding him out." Another objection has probably occurred to you of this kind. What is the use of an architect's taking time to study certain subjects, when he can always call in a specialist who has made an exhaustive study of the same subject? This objection is a very plausible one, and requires to be examined somewhat in detail. In the first place, questions often crop up unexpectedly, which require a decision of some sort to be arrived at at once, and it frequently happens that a specialist is not at hand to advise. In such a case, a slight acquaintance with a subject might enable the architect at any rate to meet the difficulty temporarily, and then, if it should happen that an expert has to be called in, no harm would have been done. Then comes the question of expense, which is frequently a serious matter to the client,—and here I am touching on a subject that was referred to a few months ago by Mr. Cole Adams in his interesting paper on Barnacles. Specialists invariably charge heavy fees, and quote rightly. If a man has taken the trouble to master thoroughly any one branch of his profession, and limits his chance of employment to that branch, he ought to charge highly for his knowledge and experience, and I quite admit that in many cases an architect would act wisely to call in a specialist to advise with him, just as a medical man calls in a consulting physician in urgent or difficult cases; but as the family doctor ought to be able to treat all cases not requiring serious and exceptional treatment, a patient would have good cause for complaint against his medical man were he to advise calling in a physician for every little ailment: so it seems to me a client may justly complain if he finds his architect unable to decide what course to adopt in matters of drainage and other scientific subjects which do not present any great difficulty. He imagines that for the fee which he has to pay he is going to obtain skilled advice and assistance throughout the whole of the work which he entrusts to his architect, and will be very likely to grumble at having to pay several extra guineas for an extraneous opinion. There is further one very decided danger in consulting a specialist. You have probably all heard of the physician who discovered a certain disease that was named after

him, and after his discovery it is said that no patient ever consulted him but he found out that the man was suffering from that very disease; just in the same way a specialist who has made any one subject a special study is almost certain to have strong opinions as to the causes which lead to the existence of a certain state of things, and he will therefore be very likely to find out the existence of these causes, and to advise expensive remedies which may not really have been required; whereas, an examination by an unbiased man who has had a scientific training, and is not apt to jump at conclusions hurriedly, may very possibly discover some simple cause for what is wrong that a very slight expense may put right. What is likely to be the effect on the general public,—and you must remember that the general public are made up of individuals, and that the way in which we treat our individual clients is a factor in the estimation in which the profession as a whole is held by the public,—what is likely to be the effect on the public if they find that when the architect is consulted on some faults of drainage, he says, "Oh, Mr. So-and-So is an authority on this point, and you had better call him in," or when he is asked his opinion as to the cause of defective ventilation, he refers to some other eminent authority? Will not the public gradually get to have a low opinion of the profession generally, and begin to question the necessity of employing an architect at all? Are not some of the articles that have recently appeared in some of the papers a proof that this opinion is becoming held more or less? Ought we not, then, to do our utmost to prevent such an opinion gaining ground? We can never tell what matters may be referred to us in the ordinary course of our practice, and we must always remember that the specialist knowledge of yesterday is the common knowledge of to-day.

It may possibly be objected that there are many cases such as I have mentioned which do not come within the legitimate province of an architect, and that if he were to attempt to qualify himself for undertaking such work, he would only be intruding into the domain of the engineer. I hold that any work appertaining to the structural stability of a building, to its sanitary condition as regards drainage, warming, or ventilation, and generally to its suitability for the purposes for which it is intended, is most distinctly within the province of the architect, and if he gives up this to others and endeavours to retain only the artistic part of the work, he will soon find that this is gone too. We do not find that engineers make any scruple about designing the ornamental features of a bridge or any other erection they may have to construct. We find auctioneers and surveyors taking to themselves the title of architect, and designing the houses that are to cover the estates which they have to sell and develop. We are beginning to find plumbers and builders calling themselves sanitary engineers and architects; and how is it that they gain the ear of the public? Simply because the public think that if they go to a man of this sort they go to a practical man; whereas, if they go to an architect they will find only an artistic dilettante who has to go to some one else for advice upon practical points. Depend upon it, if we are to hold our own in the keen competition which now exists, it will not be by taking any so-called high ground as to our being artists and nothing else, but by convincing the public that we are practically acquainted with every branch of our profession, that we can meet the plumber and the surveyor on their own ground, and by showing that, in addition to practical knowledge, we can give that artistic finish which is the result of a cultured education, and which can never be acquired by any one without the patient study to which the early years of the architectural student's life should be devoted. There can, however, be no greater mistake than to think that there is anything derogatory to the true artist in being practical, and in having a knowledge of science. As a proof of this I should only need to point to that admirable address delivered so recently by the leader whose loss we all deplore, to show how Mr. Street, artist as he was in his every fibre, worked strictly on a scientific basis, and his works are a standing proof that the true artist never sacrifices strength to beauty, or lays on ornament for the sake of doing so. But as a matter of fact the greatest artist cannot dispense with scientific knowledge. The sculptor may have the highest manual dexterity, the figure-painter the lightest and most delicate touch

with the brush; but without a knowledge of the anatomy of the human figure each will be powerless to produce a statue or a painting that shall live as a thing of beauty for ever. So with the landscape-painters: the greatest of them are those who live with Nature and study her inner workings, and not only her surface aspects; who watch the growth of flower and shrub, and note the effect upon them of storm and sunshine, who ascertain the causes by which the various tints in the atmosphere are brought about,—in a word, who make themselves thorough masters of one or more branches of physical science.

The value of scientific training is by no means limited to its direct results; those that are indirect are of equal importance. A man who has acquired a scientific habit of thought will always exercise a close observation of the facts that come under his notice; he will feel that of the causes which have led to the existence of any state of things that he may be called upon to examine, those that lie on the surface, and are most obvious, may very probably not be the real ones; he will not allow himself to be led away by superficial similarities; and, above all things, he will not be hasty in jumping at conclusions. Useful as these qualities are to every one, they are of especial value to an architect in what I may call the collateral of his profession. When once a man gets into regular practice, he will find that designing buildings forms but a part,—sometimes a small part,—of his work, which frequently consists of reporting upon the condition of buildings, settling disputes, giving evidence in courts of law, and such matters as these; and herein the indirect qualifications, which are the results of scientific study, will be of the utmost service.

I have thus endeavoured to show you, very imperfectly, how intimately we architects are interested in the advance of physical science. As I said at the commencement, so I would repeat now, that I hope I shall not be considered as in the least opposed to our being artists: it has been my endeavour to show that art and science are not antagonistic, but rather twin sisters, who ought never to be separated, and it is to any tendency to separate the two that I am opposed. Captivating as art is to her votaries, science is equally so to hers; and, in conclusion, I think I may safely promise this, that he who takes up the study of any branch of science connected with architecture will never regret having done so, but will find in the pursuit of it growing delight and an ever-increasing fascination.

## DISCUSSION.

The Chairman (Mr. Gilbert R. Redgrave) said that it could not be doubted that the study of natural laws which Mr. Slater had advocated was of the utmost importance to architects. Mr. Slater had raised the question whether lads who were intended to follow the architectural profession should not stay at school longer than was at present the general rule. Abroad, young men intended to become architects after they left school went to the Ecole Polytechnique or some such technical institution for three or four years before entering an architect's office. In such institutions the young foreign architect acquired a great deal of scientific and theoretical information. The practice of this country, of taking lads into architects' offices as pupils directly they left school might give them good opportunities of acquiring business habits, but it hardly assisted them in acquiring scientific information of the kind referred to by Mr. Slater. Some of the sciences, as Mr. Slater had truly said, were intimately related to the work of the architect. Some knowledge of chemistry alone, bearing as it did upon the nature and composition of materials, would be found of great value to the architect. As to sulphuretted hydrogen being a test of the purity of white-lead, he remembered an interesting circumstance connected with that subject. Some years ago two strips of paper were painted with pure white-lead paint. One of the strips so prepared was hung in a country privy, and the other was placed in the National Gallery. After some time had elapsed, it was found that whereas the strip in the National Gallery had very speedily become blackened, the strip in the country privy showed no discolouration. He thought that Mr. Slater had very wisely insisted upon the importance and necessity of sanitary knowledge to an architect. Within, comparatively speaking, the last few years, a large number of our towns had been



drained and sewered, and since that work had been done we had heard a great deal about the prevalence of zymotic diseases, caused, it was urged (and in some cases with too much ground), by sewer-gas being laid on to our houses. Ten years ago it was a very favourite idea with medical writers that the germs of such diseases were principally, if not entirely, conveyed by the medium of water, but that idea seemed to be being superseded by the theory that the germs were conveyed by means of sewer-gas. Perhaps there was a great deal of exaggeration in what had been said as to the spread of zymotic diseases since towns had been sewered, and certainly such statements had been strongly disputed, especially in Germany. In Munich and Hamburg, towns which were formerly very subject to diseases of a zymotic character, there had, he believed, been a great diminution in the deaths from zymotic diseases since those towns had been sewered.

Mr. L. C. Riddett proposed a vote of thanks to Mr. Slater for his admirable paper, which would, he hoped, have the effect of stirring them all up to apply themselves with energy to the study of some of the essential matters of which Mr. Slater had spoken. With regard to the education of young men destined for the architectural profession, the education which was afforded by an ordinary middle-class school would be difficult to match on the score of costly inefficiency. Such schools seemed to regard the education which was given at Eton or Harrow as the very *beau idéal* of education, and consequently when young gentlemen left their "academies" to enter an architect's office, they had acquired very little scientific or other useful knowledge. He believed that as the world became more cosmopolitan in character we should see adopted in this country some such system of architectural education as that in vogue on the Continent. Mr. Slater's mention of the value of personally mixing and watching the behaviour of specimens of mortar, cement, and concrete, had recalled to memory the fact that in the office of the late Mr. G. R. Burnell, in Bedford-row, twenty years ago, were to be seen a number of little boards containing samples of the kind. Mr. Burnell, as was known, made a particular study of the chemical composition of stone, cement, plaster, &c., and no doubt he had found the practice referred to a very convenient and instructive one. As to the question of purging for floors or walls, in order to prevent sound from passing from one apartment to another, he was inclined to think that slag-wool was the best material that could be used. It was an admirable non-conductor of sound, and was absolutely indestructible.

Mr. E. G. Hayes, in seconding the motion for a vote of thanks to Mr. Slater, said he thought it was most important and desirable that architects should have some acquaintance with the various branches of science with which Mr. Slater had dealt.

Mr. A. B. Pite said that, looking at the matter from the students' point of view, he would ask: What time had they to study all the sciences? Although he had been six years in the profession, he was only now beginning to understand and appreciate the laws of design, and design was certainly a most essential study for an architect. In moving about among the members of the Association he found that the young fellows who were the most practical and scientific were the least capable as designers; while, on the other hand, the best designers knew little about science. After all, was it really necessary for an architect to understand all that Mr. Slater had said as to the composition of bricks, the strength of iron and timber, and all that sort of stuff? A great deal had been heard lately about the coming Obligatory Architectural Examination. He thought the Royal Institute of British Architects would do more good if they could obtain a law compelling builders to pass such an examination. It was all very well to talk of foreign methods of architectural education, but it should not be forgotten that on the Continent, owing to enforced studies at the École Polytechnique and similar institutions, the young architect was frequently thirty years of age before he was allowed to do anything for himself. With all its defects, he was in favour of the English system of pupillage, and it would, he thought, be admitted that, considering the way in which architectural pupils were so largely left to "fab" for themselves, the progress of our street architecture was very satisfactory as compared with that of Paris and other Continental cities.

The motion having been put and carried, Mr. Slater, in the course of his reply, said that while he admitted that the early years of an architect's career should be mainly devoted to design, that part of his work should not be allowed to degenerate into mere draughtsmanship. His contention was that if young men who were destined for the profession remained at school two or three years longer than was now usual, so as to have the opportunity of mastering a great deal of the scientific principles of which he had been speaking, they would be much better prepared for the real work of the profession. In conclusion, he urged those of his hearers who were pupils not to entertain the notion that when their articles were completed they had no more to learn. The architect who was worthy of the name never left off learning. The meeting then terminated.\*

#### ARCHITECTURAL PROPORTION.

A MEETING of the Architectural Section of the Philosophical Society of Glasgow was held a few days ago in the Society's rooms, 207, Bath-street, Mr. James Sellars presiding. Mr. T. L. Watson, architect, read a paper on "The Natural Laws of Proportion." They were all familiar, he said, with certain purely artificial and arbitrary laws of proportion which have been more or less used by architects in the past in connexion with what were called, somewhat arrogantly, "the five orders of architecture." They were originally formulated by the Romans, to enable them to repeat the forms of Grecian architecture in their own buildings, and they had been handed down to us in the pages of Vitruvius. During the Middle Ages, fortunately, the rules of Vitruvius were lost or forgotten, but with the revival of classical learning they were brought to light, and eagerly adopted and extended by the architects of the Renaissance. At the beginning of the present century it was discovered that the inspiration which our architects sought might be obtained directly from Greece, instead of, as before, from Greece by way of Rome. After referring to the arbitrary scale of proportions formulated by Vitruvius, and developed by his successors, as a set of artificial or unnatural laws of proportion, Mr. Watson said that the works of the past ages should be studied, not that they might accurately reproduce their forms, but that they might discover the principles in which these forms took their origin, and apply them to the particular conditions of their own works. If they rejected arbitrary rules without adopting principles of some kind, they would not make any united progress. They might escape from the Egyptian bondage of the Vitruvian laws only to find themselves in the wilderness. It became thus important, if there was any fragment of principle to be discovered, that they should not allow it to escape. In the pages of Viollet-le-Duc and Ruskin there was a constant reference to principles, and it had occurred to the speaker to bring before the section the following propositions in regard to the base, suggested chiefly by their writings, which tended chiefly to establish architectural forms as a basis of natural law:—(1) The projection of the base to a column ought to be greater than that of the base to a wall; (2) that the further apart columns are from one another the greater should be the projection of their base; (3) that the less the diameter of the column the greater proportionally may be the projection of its base; (4) that the less the actual size of a column the greater proportionally may be the projection of its base; (5) that the height of a base in proportion to the height of the wall or column which it supports should be less for a high wall or column than for a low one, and its height in proportion to its projection should be greater; (6) that a base should be steeper in proportion to its height above the spectator; (7) that the base of a square pillar should have less projection than that of a round one; and (8) that a base formed in hard material may have a greater projection than one which is formed in a softer material. These were some of the considerations which might affect the setting-out of the height and projection of a base moulding. He would not have it supposed that the details of a building were to be worked out like a mathematical problem, or like a logical syllogism, in which a certain conclusion was rigorously drawn from

\* At the commencement of the meeting, the following gentlemen were elected members, viz., Messrs. E. S. Day, J. N. Cooper, F. Cresswell Smith, H. A. Foley, F. E. Banham, and T. M. Deane.

given premises. The architect must reason and exercise the instinct or intuition of an artist, and this artistic instinct was the ultimate court of appeal to which every doubtful point must be referred. At the present moment architects were almost free from the tyranny of arbitrary rules of proportion, and they no longer restricted themselves in their work to give varieties of one style, and that style a borrowed one. On the contrary, they derived their inspiration from every age and from every country. Having abandoned arbitrary and empirical laws of proportion, they had as their goal the development of a consistent architectural style suited to our wants, and at the same time adapted to our means of satisfying them. If this object was to be attained, it must surely be by a system of selection, controlled by natural laws. The whole body of architects, and, in a sense, the whole community, must co-operate if this great object was ever to be accomplished.

#### ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

##### BACK-TO-BACK HOUSES.

On the 24th ult. the quarterly district meeting of this Association was held in York. Through the courtesy of the Lord Mayor, the members met in the Council Chamber of the Guildhall. Mr. Lewis Angell, of London (past-president and founder of the Association), occupied the chair.

Mr. Styan, the City Surveyor, read a paper on "York and its Public Works," describing the sewerage of the City, the Cattle Market, Lendal Bridge, and the York Bonding Warehouses.

Mr. E. R. S. Escott, Borough Surveyor, Halifax, contributed a paper (read for him in his absence by Mr. Cross) on "Back-to-back Houses." The author treated first of the various kinds of labourers' dwellings. There was the "flat" system, which had been extensively adopted, with all modern sanitary improvements; then there was the "through" house, with garden in front and yard behind; but the North of England stood alone with what was known as the "back-to-back" system. The deserted old town mansions, divided and sub-divided into separate dwellings, were the most unsanitary and objectionable class of dwellings. The "through" house was beyond the reach of ordinary labourers. The accommodation afforded by a well-constructed "back-to-back" house was best adapted for the poor. Such houses occupied an area of about 36 square yards, having a frontage of 21 feet, and being 17 feet in depth. The accommodation was: "keeping" cellar and coal-cellar below the surface of the street, a large living-room with scullery on the ground floor, two bedrooms, and attics. The cost of such houses was from 130l. to 140l., including paving and draining the adjoining street; and the rent 3s. 9d. to 4s. per week, the landlord paying all rates and taxes. He knew of no class of house which better fulfilled the requirements of the labourer's family than back-to-back houses.

Mr. Lobley (Hanley) said the paper might be termed "an apology for back-to-back houses." Such houses were only to be found in the North of England, and he hoped that they would not long be allowed to exist anywhere in England.

Mr. Gamble (Grantham) strongly protested against back-to-back houses, which were far more unhealthy than houses with yards.

Mr. Fowler (Leeds) thought that back-to-back houses ought not thus to be discouraged. Many such were now being built in Leeds. There was far greater risk of contagion and infection in "block" houses.

Mr. Hall (Stockton) condemned back-to-back houses on every sanitary consideration.

Mr. B. C. Cross, C.E. (Dewsbury), said he was surprised to find a gentleman of the experience of Mr. Escott in favour of back-to-back houses. He did not see why "through" houses, with entrances back and front, should not be adopted for the working-classes in Yorkshire as well as elsewhere.

Mr. Hewson (Leeds) said that on the score of morality and health back-to-back houses ought not to be allowed. If it had not been for these houses, there would not now be such a great outcry in the North for fever hospitals.

Mr. Scriven (Pontefract), Mr. W. G. Penty



(York), Mr. Tudor, Mr. Jennings, Mr. Hoomes, and other gentlemen also condemned the views of Mr. Escott.

The Chairman said he thoroughly endorsed every word which had been said against back-to-back houses. He was glad that there was such unanimity of opinion against such houses. From every point of view, the system was reprehensible, especially as regards ventilation.

#### CENTRAL ASSOCIATION OF MASTER BUILDERS OF LONDON.

THE annual meeting of this Association was held on February 28, at the offices, 274, King-street, Covent-garden, Mr. G. F. Trollope, the President, in the chair. The meeting was largely attended, and included the following:—Messrs. F. J. Dove, W. J. Adamson, H. H. Bartlett, Frank Kirk, John Greenwood, A. Thorn, J. Howard Colls, Stanley G. Bird, James Greenwood, John T. Chappell, John Woodward, G. S. Pritchard, George Wall, W. Macey, George Adamson, Thomas Gregory, A. Scott, W. J. Belterill, J. H. Read, J. W. Hobbs, &c. &c.

The President, in proposing the adoption of the report, congratulated the trade of London on the amicable relations still existing between employers and employed.

In seconding the proposal Mr. Stanley G. Bird (President of the National Association of Master Builders of Great Britain) stated that among other objects carried out during the past year was one of great importance to the building trade and its various branches, viz., the establishment of the "Builders' Accident Insurance, Limited." He stated that the business done up to the present time was beyond the most sanguine expectations of its promoters. The trade had largely responded to the appeal of the directors, and it was expected that the annual report would be of such a satisfactory character as to enable them to show a large surplus. He reminded them it was essentially a Mutual Company. A bill, promoted by the leaders of the Trade Unions, has been introduced into the House of Commons to amend the "Employer's Liability Bill." There are several clauses which will seriously affect the trade, and the Committee will have to carefully watch its progress. The Chairman then referred to the late conference of architects and surveyors, and regretted that the builders had not been invited to attend, as matters were discussed which were of vital importance to them. It was hoped that a conference of architects, surveyors, and builders, may be held at an early date.

The President then informed the meeting that he wished to retire from that office, and proposed Mr. F. J. Dove as his successor. Mr. Dove, having been unanimously elected, took the chair.

The meeting then proceeded to elect the officers and committee for the ensuing year. Vice-Presidents: Mr. William Brass and Mr. George Burt. Treasurer: Mr. Henry G. Smith. Honorary Vice-Presidents: Mr. Stanley G. Bird, Mr. Benjamin Hannen, Mr. Charles Lucas, and Mr. G. F. Trollope, and a committee of twenty members. A Select Committee was appointed to consider and revise the rules of the Association, and a vote of thanks was passed to the late President for the able services which he had rendered during his period of office.

#### TRAMWAYS IN LIVERPOOL.

At the ordinary general meeting of the shareholders of the Liverpool United Tramways and Omnibus Company, held last week, the report of the directors stated that during the past year several extensive blocks of stabling and other buildings for the use of the company had been erected. They also reported that they had given considerable attention to the question of the mechanical propulsion of tramway cars; and they had not only inspected the tramway engines now working in several towns, but had offered all reasonable assistance to the makers of the same to facilitate the practical testing of these engines in Liverpool. Several trials had already been made here, but, so far, whether from the heavy gradients of the city, or owing to inherent imperfections in the engines themselves, apart from all estimate of the comparative cost, the result of these trials had not been such as to warrant the directors in recommending their adoption by this company.

Mr. George Hopkins, the engineer to the com-

pany, in his report to the directors, says that the total length of streets in which tramways are constructed and worked by the company as the present date is about 33½ miles of single line. The Corporation of Liverpool obtained powers, in 1880, to construct additional tramways in about twenty miles of streets, which will be proceeded with almost immediately, and the Bootle Corporation about six miles,—together, twenty-three miles of streets, or forty-one miles of single line. When completed, these lines also will be leased and worked by the company. It will thus be seen that, when all the lines which are authorised in the city and suburbs are constructed, the company will have a system of about seventy miles of tramways traversing upwards of forty miles of streets, forming probably the most complete and extensive system of tramways in any city or town in the United Kingdom. A dividend of 2½ per cent. was declared.

Under the Acts authorising the construction of the city tramways and the agreement for their lease by the Corporation to the company, the maximum fares were fixed at 1d. per mile, with a minimum of 3d. for an inside passenger and 2d. for an outside passenger for a single journey. Provision was made for a maximum of 3d. to the city boundary or any extension thereof, and for a fare of 2d. in cars not proceeding beyond two miles from their starting-places. The lines outside the city boundary were constructed under Acts separate from those of the city lines, and provided a separate scale of fares. The directors of the Tramways Company contended that they were, under these circumstances, entitled to charge their fares to the out-districts as for two separate journeys,—one to the boundary and another in the out-districts. This contention has caused some dissatisfaction, and, yielding to representations made by the Health and Watch Committees of the Corporation, the Tramways Company have made certain concessions.

#### GENERAL BUILDING NEWS FROM THE PROVINCES.

**Belper.**—The Belper Public Hall has been commenced, and will, it is expected, be opened in October next. In April of last year the promoters (a limited liability company) initiated a competition, the result of which was that Mr. John Johnson, of London, was elected architect to the company.

**Penzance.**—The *Cornish Telegraph* states that arrangements have been completed for providing Penzance with a new post-office, which, in point of architectural effects, and extent and completeness of accommodation, will be superior to that of any town of similar size in the West of England. A large and convenient site has been secured in Market Jew-street, and on it is to be erected a three-storied building, the ground-floor of which will be devoted to the work of the post and telegraph offices, and the upper floors to a residence for the postmaster. An outlay of about 3,000*l.* in site and building is contemplated. The site has a frontage of 50 ft. in Market Jew-street, and of 90 ft. in Jennings-street.

**Ilkeston.**—A movement is on foot having for its object the building of a Church Institute at Ilkeston, Derbyshire. Plans are in course of preparation, and the Duke of Rutland has been asked to grant a lease of a piece of ground in the centre of the town, which was lately a portion of the old cricket-ground. The estimated cost of the building and its furniture is nearly 1,000*l.*

**Wallasey (near Liverpool).**—At a meeting of Wallasey Local Board, held on the 23rd ult., the Cemetery Committee presented a report recommending the adoption of a plan submitted by Mr. Grayson, architect, for one of the cemetery chapels. The chapel (the cost of which is estimated at 1,500*l.*) is to be jointly used by Churchmen, Dissenters, and Roman Catholics.

#### MASTERS AND MEN.

**Lancashire Engineering Trades.**—The recent concession of an advance in wages by the Iron Trades Employers' Association to the men employed in the engineering shops in the neighbourhood of Manchester and Salford has been followed by an extension of the agitation for a similar advance to several other Lancashire districts. The district committee of the Amalgamated Society of Engineers have also sent out a second circular stating that the employers of labour at mills, factories, dye-works, print-

works, or works of a miscellaneous nature, where members of the society are employed and where wages have been reduced, will be required to restore the amount of such reduction from the 1st of March next. This applies to the reduction in wages in December, 1878, or on any subsequent occasion, or where the men may have started at the reduced rate. The returns just issued by the Iron Founders' Society show a decrease of 115 members on out-of-work donation as compared with last month, and the report adds that in some of their branches the members had realised an advance in wages. The reports sent in by the various districts connected with the Amalgamated Society of Engineers show a considerable improvement in trade.

**The Employers' Liability Act.**—Mr. Bart has brought in a Bill to amend the Employers' Liability Act, so as to render it compulsory, and that there shall be no power to contract out of it. The Act has been in operation for a year, and in many places the masters and men have agreed to work outside of it, and in no instance has there been any complaint made against the arrangement come to. In some districts the miners have adhered to the Act as it was passed, and in many others the contrary has been the case, the mineowners subscribing largely to a fund that made provision not only for accidents, but for sickness as well. In such cases the men are far better off than they would be were they placed under the Act. But Mr. Bart and those who are acting with him are evidently determined to give no liberty of action whatever to the working men, many of whom we believe will be found amongst the strongest opponents of the Bill brought in by the member for Morpeth. No fault has been found with the Act as it stands, and why it should be altered so as to meet the views of those who are not likely to come inside of its provisions we cannot understand.—*Mining Journal.*

#### BRIDLINGTON NEW CEMETERY.

THIS cemetery, which has lately been completed, was formed by the Burial Board for Bridlington and Bridlington Quay, is situated on the Sverby road, near the old Priory Church, and is for the purposes of a cemetery for the whole district.

The designs of Mr. Alfred Smith, architect, Mitcheldean, Gloucestershire, were accepted in the late competition for the whole of the works. The buildings are in the Early Decorated style, and comprise entrance-lobby, &c., semi-detached chapels, with central carriage-porch, surmounted by a tower and spire 150 ft. high. The chapels, which are situated in the centre of the cemetery, are identical in arrangement, and each contains nave and aisle, and spacious vestries, and accommodation for about seventy mourners. They are built on a series of arches or vaults which can be used for burial purposes. The general walling is constructed with brown Whitby stones, picked faced, with white Whitby stone dressings, and pointed; and the interiors are lined with red and yellow Scarborough bricks, with encaustic tile floor, the whole of the wood fittings being pitch-pine varnished. The roofs are covered with grey Carnarvon countess slating, with lead ridge-roofs. The lodge, which is situated in the north-west corner of the ground, is built with red and yellow Scarborough bricks, pointed, and roofed with grey countess slating in bands.

The general works have been carried out by Mr. J. Brown, Bridlington Quay; the carving was executed by Messrs. Birchborough Bros, Nottingham; and the ornamental ironwork was supplied by Messrs. G. Smith & Sons, Birmingham; the whole being executed under the superintendence of the architect and his clerk of the works, Mr. T. Pickering.

#### WOOD PAVING.

Sir,—In reply to Mr. Jacob P. Batoh (p. 238), I beg to state that a bottom of sand and boards and wide-jointed pavement have just been taken up in Piccadilly. The Norwich example given is sand or gravel, thoroughly rammed and grouted,—with lime, I suppose. This surely will be wonderfully like badly-mixed concrete.

Let me assure Mr. Batoh that his wood-paving might be cheaper if it had cost 12s. in place of 7s per yard. The foundation is the true road; wood is only a veneering.

R. RAWLINSON.



### COMPETITION FOR SCULPTURE, ST. GEORGE'S HALL, LIVERPOOL.

SIR,—I regret to find that I inadvertently exaggerated the scale required in the designs for the compartments of St. George's Hall, Liverpool; but I think most persons will agree with me that the advertisement is capable of clearer statement. The closing paragraph, however, of "J. A. P.'s" letter, of last week, fully justifies the general imputation made in my letter of the 18th, of the want of acumen of committees of taste in regard to art matters. Does not "J. A. P." know that the greater number of drawings by Michelangelo and Raffaele now in existence were, to all intents and purposes, *working drawings*, in the very same sense that the premiated designs will be, and that those drawings, after fulfilling their purposes, are still of priceless value? Fine designs, indeed, the premiated drawings would be if not worth preserving when the reliefs are finished! The use, the careful use, of a suitable set of designs would be a fair equivalent for the higher premium offered. The cartoons of Raffaele were literally *working drawings*, and I think these have been found of some little value after this purpose had been fulfilled. I have yet to learn that modern artists have so outstripped the old masters that they are in a position to consider it as *infra dig.* to go in for work of a kind that Phidias and Raffaele did not consider beneath their genius. Why should the conditions of a competition, I should like to know, be framed to the level of second and third rate ability? Committees of taste, according to "J. A. P.'s" own showing, have yet to learn the art of enlisting first-rate talent. Pericles, the Italian popes, princes, and cardinals, found no difficulty in doing so,—and why? Because they knew in what good art consists, and what they really did want.

The very uncertainty of the consequences of entering a modern art competition deters able men from taking part in them. Any man capable of making a design suitable for the ends proposed would be competent to carry them out. If the terms of success carried the execution of the designs with it, would any man unable to carry out his designs compete, or, if he did, have any chance of success? I write in no capricious spirit. I believe in competitions properly conducted. There is a general desire that art should be promoted; but there is something to be done, something to be remedied, ere art competitions will have the slightest chance of effecting the objects for which they have been instituted.

DRILL.

SIR,—There seems to be a strange misapprehension of the meaning of this advertisement. Competitors are requested to send in not fewer than three designs for the larger panels and four for the smaller. You say, in a note, "This is not suggested in the advertisement."

If you will kindly turn to the advertisement on the second page of the *Builder* you will read these words:—"Competitors must submit not less than three designs for the larger panels and not less than four for the smaller." How the matter could be explained more clearly I cannot for the life of me understand. The panels might be fifty or 500, but only seven designs are required.

J. A. P.

### ROOF COVERINGS.

SIR,—In answer to "Ironomy's" queries, I would state my experience to be as follows:—Slatting is better than galvanised iron for stables or other enclosed buildings where cattle are kept, as it is warmer, and admits a certain amount of ventilation. Slatting can be made to resist wind-stripping, no matter how exposed the buildings may be, if proper care be taken that the slates are closely and properly bedded on each other,—that the battens are sufficiently stout (an inch at least),—and that tails of sufficient length, and with large flat heads, are employed. For buildings open on one side it is far preferable to close-board the roofs on the purlins, and use no rafters, as the cost is no more than the usual method, while the slates are free from damage through accident or mischief, and the wind has no effect upon them from the under-side. Tiled roofs for farm buildings, unless sheltered,—are not so trustworthy. Poole's bonding tiles resist wind-stripping better than any others, and even these are not infallible in that respect.

Galvanised corrugated iron is less liable to damage than any other roof-covering material, is very light, and requires not above one half the timber necessary for a slated roof. It lasts longer in country districts than in towns, as the chemical action of smoke has an injurious effect upon it, and on no account should it be used near to where a steam engine is employed. Its greatest fault is its readiness to condense moisture in damp and changeable weather, the result of which is a more or less occasional dripping from the roof on whatever may be beneath, rendering galvanised iron an unsuitable covering for granaries, stables, corn and meal stores, or similar portions of a farmstead. On the other hand, for open sheds, covered stock-yards, wagon and cart-sheds, and other buildings only partially enclosed, condensation is to a great extent avoided by the free circulation of air, and a slight occasional dripping is not of so much consequence. In many instances of this kind galvanised iron can be used to advantage. I have seen a roof so covered twenty-five years since that is as perfect as when erected, and the ammonia from cattle-yards and stock-buildings does not appear to injure it in the least. I believe, however, that a coat or two of Torbay oxide of iron paint applied previously to fixing is an extra precaution against decay. The "gauge" usually employed is from Nos. 14 to 18, B.W.G., but the thickness of the iron is of little consequence compared with perfect galvanising and thorough inspection previously to acceptance from the manufacturers. To quote a particular brand, or manufacturer, would, of course, be a gratuitous advertisement, but the best quality can be obtained through any respectable iron merchant in the usual way,—viz., by paying a corresponding price.

THOMAS POTTER.

### CELLARS AND UNDERGROUND ROOMS.

SIR,—Attention having of late been drawn to the above subject, and to the duties of district surveyors in connexion therewith, and fresh legislation in the matter being more than probable, I ask your permission, in the interests of the public, to advert to two points in the working of the Act, which, it would seem, urgently call for notice.

According to a magisterial decision, I am told, only rooms used as separate tenements come within the operation of the Act.

This can hardly have been the intention, unless we are to suppose that the health of lodgers is of special importance.

Also, it appears to have been held that front rooms only are affected by the Act, this view being based on the clause which stipulates that at least 1 ft. of the height of the room shall be above the level of the pavement of the adjoining street. It seems to have been successfully argued that, as there is no street at the back, there can be no pavement-line to be regarded, and, consequently, that the law cannot be made to apply to back rooms.

The result of this apparently is, that whilst not even a single lodger can, with propriety, sleep in a front basement room, unless it be in strict conformity with the Act, the whole family of the owner may, if so minded, repose there, whatever its shortcomings, as serenely as circumstances will permit; while, as to the back room,—the small window of which, as often as not, is half blocked up with rabbit-hutches and the unsavoury dormitories of fowls, if not entirely covered in by a wash-house built out,—there would seem to be almost *carte blanche* to the family, lodgers and all, to "pig-in" à la Russe.

G. M. D.

### PLUMBERS AND THEIR WAYS.

SIR,—I feel it my duty, as a working plumber, to answer the letter that appeared in your last week's number, with respect to plumbers working to lines. I consider it would cost more for architects to get out lines and sections than the fitting and offering-up would come to; but I can assure you that a plumber who thoroughly understands his business, does work to lines of his own getting out. But at the same time there are many who call themselves plumbers who have no idea of even getting-out lines, much less of working to them; and hence the offering-up, scribbling, cutting pipe to waste, &c. I have just been helping to fix three stacks of soil-pipe, with nine closets on each stack, under very difficult circumstances, and not one trap or length

of the soil-pipe was ever offered up, but they were all prepared on the bench, and then taken to their places and fixed, and not one of them was 4 in. out. All I can say is, that builders, &c., should be careful from whom they get their recommended men, as recommendations and references stand for nothing in our trade unless from thoroughly practical men. And I beg to inform "W. T." that, if he has a similar job to do, and will send me the width of closet opening, depth of joist, thickness of wall if the soil-pipe is outside, and distance from floor to floor,—no matter how many traps there are on the stack,—I will guarantee to get it all prepared in London, and make it fit to 4 in. Then he will see that there are "plumbers" who work to lines of their own getting out.

A WORKING PLUMBER.

\* \* \* Mr. Davies and another correspondent have sent us illustrated particulars of the way in which such work should be done from lines, but we do not think it necessary to go into the subject.

### DISPOSAL OF SEWAGE.

SIR,—Surely something could be done by a persistent advocacy for an improvement in our drainage. At present (as you have stated in the *Builder*) we are liable to any amount of disease being bred on the shores of the Thames by the sewage deposits. Why it could not be collected on the marsh lands of Essex, and decomposed by the dry-earth principle, and so distributed by rail and river to assist the farmer in competing with foreign produce, it is difficult to imagine, and by filtration it would surely be possible to convert the bulk of the water into something fit to be returned to the river. With railway communication to all parts of the kingdom, a system of exobange might be arranged by which a farmer could send up so much earth and receive in exobange a certain quantity of valuable manure.

I have tried the dry earth system in England and Canada, and had most satisfactory results. Liquid sewage does not seem to pay, but the dry-earth mixture, I feel sure, would do.

It would be a splendid opening for a company to take up, and I feel sure that they would earn a fair dividend for their capital; and, besides this, be doing good to our fog-oppressed metropolis. I do not send this for publication, but only with the hope that you will bring your superior intelligence to bear on the subject.

AN ARCHITECT.

### SHELTERS IN STREETS.

SIR,—Having read Sir Henry Cole's letter in your last issue, in which he advocates permanent covered ways or porticoes to private dwellings over the public footpath, I quite agree that they are a great convenience and comfort in bad weather, but absolutely useless when fine; and further, a permanent structure at a low level, which is necessary in order to be of any utility, is objectionable over a public footpath, for the following reasons:—

1. The structure would be liable to damage by the road traffic should it project to the edge of the pavement, as proposed.
2. The liability of vehicles running under them, which, in the case of a Hansom, would probably cause serious injury to the driver. But should columns be introduced at the outer angles, the latter danger would be greatly lessened. It, therefore, occurs to me that a sliding or telescope cover of light iron and glass that can be pushed over the footpath by a lever when required, would meet the case in every respect, and this plan could be adapted to any structure.

If ornamental, it should in all cases correspond as near as possible with the architecture or style of its surroundings. The advantages are as follow:—

1. That this roof or cover could be at a much lower level than a permanent one, thus materially affording greater protection to the visitor.
2. It is not likely to meet with equal opposition from the general public, Board of Works, or adjacent neighbours.

JAS. C. GILMOUR.

**Glass Shelters in Streets.**—In connexion with the improvements at the Folly Theatre for Mr. Toole, there is a verandah, 40 ft. long, and projecting to the edge of the pavement. It is constructed of iron and glass, and supported from the building by four wrought-iron cast-iron columns or supports which are a source of danger. It was designed by the architect of the building, Mr. J. J. Thomson, and the work was carried out by Mr. Joseph Stone, of St. George's Ironworks, Southwark.



### LONDON SANITARY PROTECTION ASSOCIATION.

The first annual general meeting of this Association was held at the Society of Arts on the 25th ult.

Professor Huxley, President of the Association, took the chair, and read the annual report, which stated that at the end of 1881 the Association had 192 members, 22 of whom were medical men, who had become members in respect of their own dwelling-houses, thus showing that the medical profession were alive to the advantage to themselves and their families of having the sanitary state of their houses attended to. The need for this attention was shown by the fact disclosed by Mr. Barton's reports that 6 per cent. of the houses inspected during the year were absolutely pestiferous, and it was by a marvellous chance that they had not been hothbeds of disease. In a much larger proportion of cases of inspection, more than two-thirds of the whole, there were, it appeared, general defects.

Mr. Timothy Holmes (the hon. treasurer), in presenting the balance-sheet, which showed a balance in hand of 74*l.* at the end of 1881, said that at the moment of speaking the Association numbered 232 members, and had a balance of 100*l.* in the bank.

Professor Fleeming Jenkin, as one of the consulting engineers, said the work of the Association, as carried out by Mr. Burton, the resident engineer, had been most satisfactory. He had been surprised at the bad state of London houses, which compared unfavourably with the state of houses in Edinburgh.

The adoption of the report and balance-sheet was seconded by Sir William Tyne Power, who called special attention to the advantage to proprietors of hotels and lodging-houses of possessing a certificate from the engineer of the Association framed and hung up in some conspicuous position. The motion having been supported by Mr. E. C. Robins and others, was carried unanimously.

Mr. Robins particularly dwelt on the value of this Association to architects, and said that in his own case he bought a house and put in the drains himself,—new drains throughout,—but there was a smell in some of the chambers, which was unsatisfactory. He sent to the Association, paid his two guineas, and he got his two guineas' worth. The house had a tower, and all the closets, —three in number,—were in the tower. He was not able to get upon the roof of the tower, to test his own pipes by the soil-ventilating pipe; but Mr. Burton, the engineer to the Association, being young and active, ran up a ladder with a can of hot water in his right hand, his bottle of oil of peppermint in his left hand, and his bag in his teeth, walked along the sloping roof of the tower, and poured his peppermint and hot water down the soil-pipe. On entering the rooms to discover where the leak could be, it was found between the first floor and the ceiling.

Various votes of thanks concluded the proceedings.

### SKILLED WORKMEN.

SIR,—I have to thank you, as one who can fairly lay claim to the title of a skilled workman, for opening your columns to this discussion, and to beg you not to allow it to close till something is done to remedy the present state of things.

As an apprentice, workman, trade-unionist, foreman, clerk of works, and surveyor, and for twenty-two years of my life in responsible charge of workmen, and having given this labour question some consideration, you will, perhaps, allow me to say a few words.

There is no doubt that workmen, as a rule, get worse and worse. Even those that are skilled do so little for the wages they receive, that the care and worry of those that have to be responsible for cost is unbearable. So far education has not helped, but rather hindered, technical education. Workmen I have had, with I know not how many grade certificates from South Kensington, and have utterly failed to set out a common skylight; and I have been pestered with men who consulted a price-book, and measured up their work each day, and if any complaint was made, told you how many yards they had done, and the usual trade price, forgetting all incidental office and other expenses an employer finds run up the cost. An examination of the causes for the present state of things shows that many explanations can be given.

The apprentice system is no doubt the best, but I fear this is gone for ever. No doubt the long struggle for supremacy between masters and men conducted to prevent parents apprenticing their sons to a trade.

The funds of schools where lads were educated available to apprentice them have been shamefully diverted from their proper purposes. I know one where the master tells the lads he hopes none will disgrace him by choosing a trade, most of his pupils being in the professions.

Here are the funds for a system of technical schools all over the country ready to hand; the premiums should be used in establishing model workshops, to teach lads how to use the tools of the various trades practically, not too scientifically.

The development of the railways, telegraphs, and various branches connected therewith, have withdrawn from the trades a large number of the intelligent, strong, active, in fact, the pick of the working class; to this must be added the police, where good conduct and intelligence open up promotion to be a superintendent with half the study requisite to make a good foreman.

There is another and more potent element—the contempt and dislike that the present middle class show for workmen, however intelligent; and this is repaid with interest by the workmen themselves, and is the most difficult and dangerous of the many causes, and it is of vital importance that it should be combated on every occasion.

The labour market is crowded with men and youths that would gain a good living if trained as skilled workmen, but who have been taught only to write and keep accounts, and are drawn out of offices by boys from Board schools, to be replaced in their turn by boys from other Board schools.

I have often been amused by the horror of "mamma" at one of her boys wishing to be a common carpenter! Surely, in this Christian country it should be no shame to follow the same calling as the Saviour of the world. I caught one of my youths, of a respectable family, packing his hand-saw in brown paper, as he thought it would disgrace him to carry it through the street.

This treatment of the workmen has driven many of them to emigrate, spending the harvest of their life in the Colonies, after being taught here, and returning, alas! in too many cases, to spend their helpless old age in an English workhouse. I am sorry to see some correspondents attribute this to the action of trade unions. At one time a unionist, I emphatically deny this. Trade unions never were strong enough for anything of this sort; the old trade traditions of non-unionists have done more harm than all the trade unions.

I am not an old man, but I can remember, as a child, seeing the workmen around the tommy-shop, and the ticket for clothes and food was a part of a contractor's weekly pay. In other cases men were kept waiting till seven and eight in the evening outside the employer's door for the small wage so hardly earned. Many workmen will remember when her Majesty called in the light globe; nearly all this loss in weight was taken out of the wage, and many a poor mother had to shorten her children's bread to find a contemptible profit for the employer; from daylight to dark, through all the week, the father of the family never saw his children except in bed.

The trade unionists of the past altered those things, and I am not ashamed to say I was one of them; at least, we have raised the workman that he can look his employer in the face and make his bargain as a man, and as long as it is kept in that path it could not but help the skilled workman. Any interference in the amount or quality of the work on their part, I counsel them, means ruin to them and the commonwealth.

It is from the nettle danger we pluck the flower safety; why not subsidise the trade unions, and offer them technical tutors and special advantages? Here you have the organisation, and depend on it you would give them such an eye-opener as would lift them up to a higher level.

I fear building schools or technical colleges will do little good. I look with deep concern on the medical and scientific schools with their full-fledged M.D.'s that when called in cannot diagnose the disease, and are not sure if it is typhoid or whooping-cough; at the certificated and diploma'd teacher of agriculture that cannot tell a parsnip top from a carrot; at the slipshod young architect that cannot tell oak from pine, or a stock brick from a red rubber; and at the certified teacher of building construction that asks me the use of a tilting fillet for slates.

Drawing, drawing, always drawing, will never make a skilled workman, nor will gazing at 2-in. cubes teach him to judge materials. There is no royal road, but competent teachers will do a great deal; and to you, who have done so much, I look for assistance in this important national work.

R. P., C. W.

SIR,—Kindly afford me space briefly to reply to some of the statements made by your correspondent, "One of the Old School."

Your correspondent regrets the passing away of the old system of apprenticeship, the absence of any system of classification, and the advent of the convector in the place of the skilled one-branch employer. Now, sir, while fully agreeing with "One of the Old School" when he points out some of the evils that have come out of the transition, yet I must assert that he is mistaken when he charges the trade unionists with either creating or perpetuating any of these evils.

I have had considerable personal experience of the old system, and know that between the cupidity of the employers and often the stupidity of the apprentice, it did not invariably produce the best results.

In regard to classification, workmen cannot (with justice to themselves) accept it until employers are willing to apply it in a more honourable manner than they have hitherto done. Their method of applying it gives a premium to inferior work, and leaves to the highly-skilled artisan this position,—he is only employed when superior work is to be done, dismissed immediately he can be spared, leaving to the less skilled and cheaper man the minimum of employment.

This is the system (not trade unionism) that creates and perpetuates the evils that "One of the Old School" deploras. W. P.

### UNSKILLED ARTISANS.

SIR,—I have read the letter in the *Builder* by "Common Sense," on the cause of the retrogressive and unskillful character of the artisans of our day, which he attributes to trade unions. He states that members are admitted into the unions without reference to their ability. In contradiction of this I quote from the qualifications of admission into the largest society of carpenters and joiners. Candidates must be in good health, have worked at the trade five years, be good workmen, of steady habits, and good moral character.

Then, he says it is well known that it would not do for a skillful mechanic to object to work side by side with an incompetent newly-fledged unionist. I should think not, or a non-unionist either. Surely "Common Sense" ought to know that every journeyman is under a master or foreman, or both, and that they (not the journeyman or the union) have the employing or discharging of his fellow-workmen. The fact is, we must look elsewhere for the causes of the bad workmanship we profess to be so grieved about. One very great cause of it is the speculating builder and those who support him; another, the system of contracting for working, which is only another kind of piecework. The list of tenders in your paper every week will testify that the lowest tender is almost invariably accepted. Now, sir, it is not in human nature to lose at a job, if it can possibly be avoided; and as competition is so keen, the lowest tenderers can rarely do the work properly for the price, and so the workmen are hurried on,—told to push it out and not stand particular, &c.

I have, during an experience of fifteen years, known many a good man found fault with, and in some cases discharged, for doing work as it ought to be done, and in a reasonable time; but seldom have known one discharged for turning out a bad job, if only he pushed it off in a little less time than usual. JOINER.

### BAGSHOT CHURCH TENDERS.

SIR,—Some of your readers will remember the announcement in your paper that long titles that in the competition for this church the design of Messrs. Bromilow & Cheers, architects, of Liverpool, was accepted, and that the cost of carrying out their design was guaranteed not to exceed 3,000*l.* Builders willing to tender for the same were invited to send in their names and addresses. They were accordingly furnished with the quantities. The drawings could be seen at the office of the architects at Liverpool. Now, it might reasonably be asked if some arrangements could not have been made for their inspection in one of the rooms of the Bagshot Institute, seeing that these rooms had been used by the committee of the proposed new church. I venture to say this would have been considerably nearer to most of those who tendered than Liverpool. One might naturally come to the



conclusion that if their office had been in New York, builders might see the drawings by calling there. However, tenders were sent in, but the architects, lacking the courtesy of their profession generally, did not think it worth their trouble even to acknowledge them by sending a list of tenders, or publishing them, although asked to do so. There certainly could have been no reason for withholding these unless their publication would have made known the fact that the figures were conflicting with the guarantee which had been made known through the *Builder* and elsewhere. Having seen the drawings and carefully priced out the quantities, I venture to say, and I am not alone in this view, if the drawings are carried out, and in accordance with the quantities, the committee must be prepared to advance considerably beyond the guarantee. Their opinion, of course, will be formed when all the tenders are submitted to them; not, as at their last meeting, only one. Surely, the committee might know if the builders are not to be entrusted with the secret.

Your readers will admit the fairness of the request that builders who devote their time and money in preparing an estimate should at least receive an acknowledgment of the same and a list of tenders.

X. C.

### BUILDING IN CEMENT AND MORTAR.

SIR,—I have read with interest the article on the above in your issue of the 28th ult. Undoubtedly the reason the sample gauged with sea-water eventually became the strongest was in consequence of the saltiness keeping the material damp, and thereby checking the hardening or setting.

I have on several occasions carefully read articles in your journal on tests of cements and limes, but I have by experience found that to obtain really strong tenacious brickwork, in either cement or mortar, the simplest and best method is to use wet materials and stiff-made mortar or cement. The masonry is generally wet, laid slowly, and, instead of drying into dust, as mortar does when bricks are used dry (sometimes even fresh from the kiln), the whole mass sets firmly and much more evenly together, and the mortar, instead of being detached, will adhere to the bricks so tenaciously that if the mortar were made with some of the best limes in general use, and of reasonable proportions, it would be impossible in many cases to clean the bricks after a few years.

The same may be said of cement, especially Portland. Portland cement used with dry porous bricks, &c., although setting apparently very hard and quickly, in a few years frequently falls off in scales, and generally after frost, and simply because it never firmly adhered to the dry bricks, or other material used.

The same may be said of the pargeing to flues,—an important matter.

Many of the fractures seen in new buildings are caused by the rapid hardening of the mortar and cement, producing uneven settlements. Hardness in mortar or cement is not a real proof of strength. There is in good mortar and cement a toughness; also grouting every third course is now, I believe, little practised. It will be a very dusty job pulling down buildings erected in this manner, the mortar being made into thin liquid (and thereby much reduced in strength), and poured on dry materials.

The particles of mortar not absorbed dry into dust.

The mortar in ancient buildings being of such good quality, and retaining its tenacity, is undoubtedly due to the materials being wet when applied. The slow progress of those buildings no doubt greatly added to their stability. The walls, although so old, are generally proof against dampness in wet seasons, not like the walls of the present century buildings. It does not so much depend upon the thickness of the walls, as on the porosity of the materials used. The quality of the labour being very different from that of the present had much to do with the soundness of the structure, the intention being well filled with mortar, not as at present in most cases left open. But I will not say any more at present as to inferior labour, as I have given my opinion thereon before.

Some of the numerous readers of your journal may doubt some of my statements, but I have found ample proofs of what I state in the construction of a very extensive building.

G. R.

**Industrial and Sanitary Exhibition at Sunderland.**—Referring to our notice of this in the last number of the *Builder*, we understand that the Exhibition has remained open during the current week with great success, large numbers attending daily. One of the new inventions has been "The Ord" Patent Gas Engine, exhibited by Henry Warr & Co., of 3, Blomfield-street, London-wall, London, who are sole licensees for the United Kingdom. This has received great attention from a numerous class of the public, being adapted for many purposes, where small motive power is wanted at a moment's notice for driving sewing-machines, churns, chaff-cutters, printing-machines, hair-brushing machines, sausage-making machines, and so on.

### THE QUESTION OF DRIPS.

SIR,—On reading Mr. Christian's address to young architects, it struck me with the straightforward and business-like manner of delivery, and if young students were to take the hints given, there would not be so many broken contracts as there are. But there is one point on which I should like to express dissent. Mr. Christian says, in writing a specification, the young man should not say, "Provide for the necessary drips in the lead gutters," but should always state what drips are necessary. Now, I venture to say that drips are an evil in any roof, and should be avoided.

I have had great experience in roofs, and at several large houses round Primrose-hill there have been leaks in the roof, and slaters, plumbers, and carpenters, have been sent up to see what was the matter. The plumber suggested a new gutter, the slater re-slating, and all at a fearful cost. I was told that for years this leak had been going on, and could not be found out. On examination, I found the roof, the gutter, and the slates all seemed good, and yet there was a leak in the roof. I ordered the slater to take a few slates off on each side of the drip, which was in the centre of the roof or gutter. It was a 1½ in. drip. I then took the lead up at the drip, and there was the evil; the under sheet worked so thin that a hole was worn through at each corner, and the top one cut through at the edge of the drip. I took the old lead up 6 in. from the top side of the drip, and 1 ft. 6 in. from the under side of the drip; then I cut a groove across the boards in the gutter, 1½ in. wide, and dished it out; then dressed the edge of the old lead into it, then I got a block of wood, 1½ in. thick, 15 in. long, and the width of the gutter, and had it cut like a wedge, 1½ in. at one edge and nothing at the other. I put that into the gutter; then I got a piece of new lead, 2 ft. long, and the width of the lead in the gutter, and dressed each end of it into the groove; then made a plumber's wiped joint over it. There was a smooth gutter at once, and an evil that had lasted for years was cured. I have had at least forty houses round the Hill done that way, and cured them all.

In new houses I avoid drips as much as possible, for the plumber in dressing 6 lb. lead into the corners, draws it out so fine and dresses it so close into the corners that the lead is very thin in the corner, and in time it wears through, and the roof leaks. It often happens that the leak at the drip will run along a ceiling joist, and make the ceiling wet at the wall, and a man is called in, and he says it is the fillets that are defective; he gets a job to repair all the fillets, but he does not stop the wet.

I put a gutter to a large roof two years ago, the gutter running along the west side of the house, and round the south side, and about 12 ft. along the east side to the outlet; now that was about 72 ft. run. I had a 7½ in. fall from the top end of the west side to the outlet, and no drips at all, and I have watched it in the fiercest storm, and I cannot see any wet on it, all of it seems to slide off so easy and so even that I cannot see it. Through all that snow last year we had no overflow, nor no soaking of rain through.

CHARLES SPENCE.

### NEW OFFICES FOR THE LEICESTER UNION.

IN the competition (limited to members of the Leicester Society of Architects practising in Leicester) instituted by the Guardians of the Leicester Union, for designs for a proposed new board-room and offices, to cost 5,000l., eleven sets of plans were in. Messrs. Redfern and Sawday have obtained the first position. No money premium was offered for the best design, it being a condition that the author or authors of the design so placed would be entrusted to carry out the work, the remuneration being 5 per cent. on the expenditure. The premium of 20l. offered for the second-best design has been awarded to Mr. J. B. Eyreman, and the premium of 10l. for the third-best design to Mr. J. Tait. We understand that Mr. Murgatroyd, of Manchester, was called in to advise the Board in making the selection.

The design selected for execution is Classic in character, the materials used externally being red brick with stone dressings. The building will be erected on land which the Board have acquired in Peckington's-walk, and will have three frontages, one to the walk, one to Rupert-street, and the third to the angle of Rupert-street and Chancery-street, its cost being estimated at between 5,000l. and 5,500l., exclusive of the site. It will be two stories high.

The Oldham School Board has appointed Mr. Thomas Mitchell, F.S.A., architect for their schools at Waterhead. The Corporation has placed the property presented by Mr. Bowker for a free library and gymnasium at North Moor in the hands of the same architect for necessary alterations.

### CONTROLLING CLAUSES IN ASSIGNMENTS.

WORSLEY V. SWANN.

THIS was an action (before Vice-Chancellor Hall, High Court of Justice, Chancery Division), by Sir William Worsley and his trustees to restrain the defendant from proceeding with the erection of a circus and a model lodging-house or "Peabody building" on a piece of land in the city of York.

The land in question had been sold by the trustees, subject to a covenant, entered into with them by the purchaser, that "any building which might be built upon the land should not be used otherwise than as and for a private dwelling-house," or for any objectionable purpose. It was not denied that the defendant had been erecting the buildings complained of, but he contended that in so doing he was not committing any breach of the covenant, inasmuch as he was entitled to erect any building he pleased upon the land, provided he did not use it in contravention of the covenant. However, he was quite willing, and had submitted at an early stage of the proceedings, to stop the building of the circus; but he urged that the erection of a building to be used as a model lodging-house was not within the restrictive covenant.

The Vice-Chancellor said that, for the purposes of granting an injunction, the plaintiffs were entitled to complain of the erection of any building which was manifestly intended to be used otherwise than as a private dwelling-house. He also held that the terms of the covenant were sufficiently wide to prevent the user of any building to be erected on the land as a model lodging-house.

### THE LAW AS TO DAMP HOUSES IN SCOTLAND.

TOWERS V. YOUNG.

THIS case, heard in Falkirk Small Debt Court on the 22nd of February, is reported in the *Falkirk Herald*.

The plaintiff, Mr. Towers, of Grahamston, sued the defendant, who had been a tenant of his in Russel-street, for the amount of a half-year's rent due by him at Whitsunday, 1881.

Mr. Gibson, solicitor, stated in defence that the house was so damp as to be uninhabitable, that it had been certified by Dr. Haig and by the sanitary inspector to be so, and that the defendant consequently left it shortly after the new year, and was not liable for the rent. In support of his case there were examined, besides Dr. Haig and Mr. Neilson, sanitary inspector, and other witnesses, who spoke to the unhealthy condition of the house.

Mr. Wilson, solicitor, for pursuer, stated, and the pursuer and his daughter gave evidence to the effect, that Young had taken the house knowing it to be damp one, and that this being so he was not entitled to leave the house without paying the rent, or at all events that he was bound to pay rent for the house during the time he had occupied it.

The Sheriff did not entertain this view, but decided that the house was uninhabitable, as had been shown by the evidence, and that Young was not liable for the rent; absconded the defendant, and granted 15s. of expenses. His lordship also remarked that there was the presumption that Mr. Towers could have been pulled up, under the Public Health Act, for renting such a house.

### CHURCH-BUILDING NEWS.

**Paddington.**—H.R.H. the Princess Christian has laid the foundation stone of a new parish church for Paddington, to be erected on the site of the present Church of St. James, Westbourne-terrace. The new building, which will be of late fourteenth-century Gothic style, is from designs of the late Mr. Street, and will be carried out under the immediate supervision of Mr. Arthur E. Street and Mr. A. W. Blomfield. It is estimated that the church, which is intended to accommodate a congregation of 1,300, and which is to be finished by November next, will cost about 14,000l. The walls are to be of brick with black flint facings and Bath stone dressings, the interior to be fitted with oak seats.

**Incorporated Church-Building Society.**—At the last monthly meeting of this society, grants of money were made in aid of the following objects, viz.:—Building new churches at Gloucester (St. Paul), 200l.; Holly Hall (St. Augustine), in the parish of Dudley, 200l.; and Penrhinweib, in the parish of Mountain Ash, near Aberdare, 100l.; rebuilding the Church of Cray (St. Tiid) in the parish of Devynock, near Brecon; enlarging or otherwise improving the accommodation in the churches at Abergorkick, in the parish of Llan-bryther, near Carmarthen; Ashill St. Mary, near Ilminster; Bushill-row (St. Paul's), Finsbury, Middlesex; Pentraeth (St. Mary) near Menai Bridge, Anglesea; and Washington (Holy Trinity), near Fence Houses, Durham.



## Books.

*Album of Decorative Figures.* By J. MOYR SMITH.  
London: Sampson Low & Co. 1882.

What is a "decorative figure"? The phrase is so loosely used now that it certainly needs definition. We should say that the phrase, if it is to have a distinct meaning, implies the use of the figure in a conventionalised treatment, for the purpose of making it assume its place as part of a scheme of decoration, and harmonise with the rest of the work without predominating over it; and the idea also includes the conventional treatment of the figure in reference to the material which is employed, reducing it to such a degree of non-naturalism that it may be within the capabilities of that material, if it be (as in decorative work it generally must be) a material not affording opportunities for attaining realism. In regard to the place of the figure in the scheme of decoration, it is obvious that a figure which is to play such a part must not be endowed, so to speak, with too high a life or too intellectual an expression; in such a case it will rise to the level of a picture, and will appear to be unworthily treated in being mingled with decorative work and made a part thereof. The figure, as part of decoration, should express some easily apprehended and simple phase of feeling, or some special beauty or effectiveness of pose; or it may be introduced simply with the object of showing the fine lines of the figure for the sake of their own beauty, without giving any special expression to the face at all. In any case, it must not express strong emotion or violent action or impulse; for the first raises it above decorative level, and the second disturbs repose, and may even in time become an annoyance to those who have it constantly before their eyes. And as in almost every decorative use of the figure the material itself is likely to be such as to preclude delicate modelling (where representation is pictorial and not sculptural), there is additional reason for the greatest attention to be paid to outline, by which alone the desired expression and character can really be conveyed.

We do not consider that all the figures in Mr. Moyr Smith's book by any means come properly under the definition of decorative figures. The compartment of a frieze in the Sanatorium at Virginia Water, for instance, is much more what may be described as a fresco picture of three figures; the figures are connected together, it is true, by a conventional wall and foliage (not very conventional either) filling up the background, but they are, as far as attitude and dress go, realistic figures sitting on realistic seats, and we do not call them decorative,—they are pictorial. Figures treated in this kind of position, and with this kind of object, must be more idealised, more removed from the reminiscences of real life; they must be figures in the abstract, and belong to no time or place. This is better done in the subjects representing "Legend," "History," and "Epic Poetry." Plate IX., also part of the aforesaid Sanatorium decoration: here the figures are purely abstract, and their costume likewise, and they consequently serve to represent suitably an abstract idea. In connexion with these and some others in the book, it may be observed that Mr. Smith's decorative or conventionalised architecture is generally good, and combines effectively with the figures. The set of designs representing trades, on Plate XVII., are also good examples of decorative figures, and would come in well as the salient points of a conventional wall decoration. The figures of some of "The Months," on Plates XIII., XIV., are in one sense excellent illustrations of the true method of connecting the figure with decoration, each figure being drawn across the centre of a circular background or nimbus, as we might call it, inscribed with conventional ornament; but then the figures are not nearly conventional enough for the background, to which they do not seem to belong; they are semi-grotesque figures in realistic costume, though not the costume of to-day. Mr. Moyr Smith, no doubt, may say that they are intended as jokes, to which we should answer that they are not very good jokes, and that they are certainly not beautiful; and it does seem to be one object of the use of the figure decoratively to produce the impression of beauty. Mr. Marks has set rather the fashion of a run on the grotesque lately in decorative painting, and illustrated it, we need not observe, very cleverly and with much humour; but for all that, we think that

this kind of thing is better suited for what is called *genre* painting, where the object is the realisation of human character, than for the decorative treatment of walls, where such grotesques seem to us to be somewhat impertinent and irritating rather than decorative; we certainly should not care to have our walls so decorated.

The two long panels, Nos. XXXI. and XXXII., a scene from "Twelfth Night" and one from "Henry VIII.," are really decorative paintings with decorative backgrounds, in which the conventionalised architecture is very well treated, and in the "Henry VIII. scene," "Queen Katharine and her Maidens," the artist has been very successful in the drapery of the figures, which falls in very graceful and at the same time natural folds.

*Illustrated Handbooks of Practical Art.* Art-Work in Gold and Silver. By HENRY B. WHEATLEY, F.S.A., and PHILIP H. DELAMOTTE. Art-Work in Earthenware: same authors. London: Sampson Low & Co. 1882.

THESE are two of a series of "Illustrated Handbooks of Practical Art," the object of which is "to bring to the notice of students and amateurs of art, as well as all lovers of the highest excellence in workmanship, numerous examples, both ancient and modern, of the application of beautiful design to articles of every-day use and to the various objects which are frequently employed for purposes of decoration." Each handbook will contain an historical record of the progress of the art of which it treats, from the earliest times to the present, and will be illustrated with from forty to sixty engravings.

The two specimens of the series which we have before us promise very well, so far as such intricate chapters in art can be treated in so small a space. The illustrations are well chosen and well engraved, and the historical portion seems well written and condenses a good deal of information into a small space. We observe that in the "Gold and Silver" volume the authors have fallen into the popular error of describing a bishop's pastoral staff (of which class of article a fine illustration is given) as a "crozier." A crozier was a staff with a small cross, not a crook, at the end, and was the ensign of an archbishop. The bishop's staff with the crook at the end was indeed called "crosse d'évêque," probably because it was the substitute in the bishop's hands for the actual cross which was carried by the archbishop; but it was never called a "crozier."

*On the Preservation of Life and Property from Fire.* By JAS. HENRY HEATHMAN, Fire Engineer. London: Simpkin, Marshall, & Co. 1882.

WE agree with Mr. Heathman in believing that in publishing this book he is conveying information which possesses intrinsic value for the benefit of persons owning or having interest in the management of warehouses, factories, stores, docks, wharfs, banks, manions, hotels, clubs, colleges, hospitals, asylums, work-houses, barracks, gaols, and other buildings, including even the ordinary private dwelling, and as, in almost every instance, a person's property depends for its happy immunity from fire upon the care and attention of the servants and others about him, and as the majority of fires owe their origin to some action or omission, accidental or otherwise, on the part of an *employé*, benefits will undoubtedly accrue from employers' distributing copies of this work among those persons to whom they have to look for the preservation of their property and interests.

The author is a practical man, and the little book is full of useful suggestions, the importance of which has been brought home to him by experience.

## Miscellanea.

**Society for the Fine Arts.**—On Tuesday evening the Lord Mayor and the Lady Mayoress gave a *conversazione* at the Mansion House, in connexion with the City of London Society of Artists and the Society for the Fine Arts. The Mansion House was decorated, and the electric light (that of Mr. Crompton) exhibited the pictures and statuary to good advantage. During the evening some vocal and instrumental music was given. The arrangements were made by Mr. Deputy Edmondson, Mr. E. W. Parkes, and Mr. J. B. Dicksee, the curator of the works of art belonging to the Corporation.

**"Upton Royal" (late Slough).**—At Slough, Bucks, last week, a meeting of the residents was held, under the presidency of the Rev. P. W. Phipps, the vicar, for the purpose of considering the desirability of altering the name of the village to Upton Royal, and memorialising the Postmaster-General and the Directors of the Great Western Railway to use the same instead of that of Slough, which it was said gave people a bad impression of its sanitary condition. Mr. Frederick Charsley, registrar of Eton College, who had convened the meeting, explained that the name of the village had originated many years ago in consequence of the bad condition of the Bath road, boards having been placed in the vicinity to warn travellers to proceed "alow," the latter word having afterwards developed into "Slough," which, according to Johnson's "Dictionary," meant a deep miry place, a hole full of dirt. Some objection was made to the alteration of the name, but eventually Mr. Charsley proposed, "That in the opinion of the meeting the portion of the parish of Upton-cum-Chalsey, now called 'Slough,' should in future be named Upton Royal." The motion was seconded by Mr. Springall Thompson, county magistrate, who thought the change of title would be most desirable and beneficial to the locality. Mr. Elliman protested against the change, and was supported by Mr. Herbert, the latter proving that the name was very ancient, the village having been called "Le Slowe" as far back as 1440, when Eton College was built, the bricks for which were made at "Slowe" 442 years ago. At the close of the discussion, Mr. Charsley's resolution was carried amid cheers. The town has since been placarded with the announcement that "The name of this town is now 'Upton Royal.'" It remains to be seen whether the Post Office authorities and the Great Western Railway Company will fall in with the views of the promoters of the change. It seems that an abortive attempt was made some years ago to change the name of the town to Herschelville, after the great astronomer, Sir William Herschel, who resided there. There appear to be about thirty "Uptons" in England, but only one "Slough." The change is absurd.

**Recent Advances in Photography.**—Last Captain Abney, F.R.S., delivered the fourth and last of his course of Cantor Lectures on this subject in the hall of the Society of Arts last week. He showed that a positive picture could be obtained by light in the camera by means of a preliminary exposure of a plate to white light, and then treating it with a solution of potassium bromide, subsequently exposing it to the image formed by a lens. From this was deduced the fact that a plate prepared with excess of soluble bromide became sensitive in proportion only to the absence of the latter salt. The lecturer predicted that more rapid plates than were now got would be forthcoming by eliminating the soluble bromide altogether. The destruction by oxidation of the photographic image was then vividly demonstrated, as well as the reversal of the image on gelatine plates, of which phenomenon an explanation was given. The use of sensitometers for measuring the sensitiveness of plates was dwelt on, together with the use of photometers for measuring the degree of exposure required for landscape subjects. The phosphorescent spectrum was thus introduced, with illustrative experiments of great beauty. Instantaneous shutters were next alluded to, and the method of securing a register of their rapid action by means of a simple arrangement with a tuning-fork. The application of photography to a particular branch of science was exemplified in some capital generic photographs illustrating types of families and classes of men. Sir F. Bramwell, in proposing a vote of thanks to Captain Abney, spoke highly of the interesting and instructive character of the course of lectures just concluded.

**Coventry** is about to erect, by public subscription, a statue in marble of Sir Thomas White, a London merchant, who was Lord Mayor in the time of Queen Mary. He gave a large bequest for the benefit of the young freemen, and other citizens of Coventry, in 1542. Messrs. Wills, of London, are the sculptors.

**Sir Walter Scott in Rome.**—A number of the leading families of Rome, including the Dorias, Colonnas, Strozzi, Cesarini, Odescalchi, and others, under the presidency of the young Duke of Sermoneta, have resolved to place a memorial tablet on the house in which Sir Walter Scott resided during his stay in that city.



**District Surveyors.**—At the meeting of the Metropolitan Board of Works on the 24th ult., a report was presented by the Building Act Committee recommending that, in the opinion of the committee, the two vacant districts of West Wandsworth and of East Wandsworth and Tooting Graveney, should be offered in the first instance to some of the existing district surveyors, and recommending that the Board do, on Friday, the 3rd prox., at one o'clock, p.m., proceed to make the appointments from the following gentlemen:—(a) Mr. G. Aitchison, district surveyor of Woolwich; (b) Mr. T. Roger Smith, district surveyor of St. Saviour's, Southwark, &c.; (c) Mr. J. B. Redman, district surveyor for the Tower Liberty. Mr. Deputy Saunders moved the adoption of the report; but Mr. Richardson contended that under the resolution of the Board the committee had no power to submit the names of any gentlemen as candidates for the two vacant districts, and submitted, as a matter of order, that the motion for the adoption of the recommendation contained in the report could not be put. The chairman said he thought the committee had somewhat exceeded their powers, and suggested to Mr. Deputy Saunders that he should move the adoption of the report, but stopping at the words "district surveyors." Mr. Deputy Saunders said he would adopt this suggestion, and the motion, thus amended, was agreed to. The Board further resolved, on the motion of Mr. Deputy Saunders, to proceed to make the appointments at its meeting on March 10, and Mr. Freeman moved further that a circular be addressed to all existing district surveyors informing them of the intention of the Board, and inquiring if they desired to become candidates for either appointment. This proposition was also agreed to.

**The New Ashton Fish Market,** which has been in course of erection during the past twelve or eighteen months, was formally opened last week by Alderman James Walker, the chairman of the Market Committee. The alterations and additions which have been carried out, at an expenditure which in the aggregate will amount to 6,000*l.* have resulted, we are told, in the provision of one of the best-arranged and one of the most suitable fish markets in the North of England. Externally the building is of pressed bricks, with polished stone dressings, the two entrances having very handsome polished stone gateways, with pilasters and richly-carved capitals, the spandrels over the arches being enriched with carvings of fruit and birds, &c. Internally the fish market is a spacious hall, 114 ft. long by 30 ft. wide, lighted principally from the roof, which is of cast and wrought iron, boarded underneath to form a ceiling and picked out in colours, the walls being lined throughout with white enamelled bricks relieved by a dado line of pale blue. The stalls have Sicilian marble tops, and wrought iron racks are provided for rabbits and game. Mr. William Neal, of Ashton, is the contractor for the whole work, which has been carried out to the designs and under the superintendence of Messrs. John Eaton & Sons, architects.

**The Royal College of Music**—Under the presidency of the Prince of Wales a large and highly-influential meeting for the purpose of soliciting public support in aid of the foundation of a national institution for the cultivation of music, was held on Tuesday morning at St. James's Palace. The chairman having spoken at considerable length, the Duke of Edinburgh moved a resolution expressing approval of the proposal to establish a Royal College of Music as a national institution, and pledging the meeting to make the utmost exertions individually and collectively to forward the movement by obtaining the necessary funds for founding and endowing a College of Music for the British Empire. This resolution having been seconded by the Archbishop of Canterbury, and supported by Lord Rosebery, was carried unanimously. We have already expressed our views on the subject, and shall before long return to it.

**Additions to the Head Quarters of the Metropolitan Fire Brigade.**—At the meeting of the Metropolitan Board of Works on the 24th ult., it was agreed to enlarge the accommodation at the head quarters of the Metropolitan Fire Brigade, Southwark Bridge-road, at an estimated cost of 20,500*l.*

**The Construction of Electrical Railways in Germany,** for industrial and other purposes, progresses rapidly.

**Newspaper Press Fund.**—The annual general meeting of this society, held on the 25th ult., was numerously attended. Sir Algernon Borthwick, a vice-president, was in the chair, and the proceedings were altogether satisfactory. The report stated that the roll now comprised 422 members, of whom 284 resided in London and 138 in the country. Of the whole 111 were life members. The number of applications by members or their representatives for assistance had been less than in several previous years. The committee had made fifty-one grants to forty-two persons, involving a total expenditure of 862*l.* His Royal Highness Prince Leopold, Duke of Albany, K.G., had consented to preside at the anniversary dinner, which is fixed to take place at Willis's Rooms, St. James's, on Saturday, the 24th of June next. The amount dispensed was smaller than usual, the applications being fewer.

**Steam Digging.**—A large party of landowners, farmers, and visitors assembled last week at Stevenage to see the operations of a new steam-digger, manufactured by Messrs. Proctor & Co., for the inventor, Mr. Parker. The object of steam digging is to reduce the cost of cultivating land, and to substitute for ploughing an operation which market-gardening has shown to be also more profitable. The digger was worked in a large field with great success, making with three forks, each carrying eight tines, cuts into the ground of 9 in. deep by 1 ft. in breadth, and turning the clods cleanly over for exposure to the air. The digging-frame is complete in itself, and carried a ten-horse Robey portable engine, which was mounted on it as its motive power. It is so constructed that backward motion is practicable as well as forward motion. The digging machinery can be applied to or detached from an ordinary portable engine. Mr. Parker's digger can be worked by one man, and will, it is said, turn up an acre of ground per hour at a cost of 2*s.*

**Society of Engineers.**—On Monday, the 6th of March next, in the Society's hall, Westminster-chambers, a paper will be read entitled, "Notes on Electric Light Engineering," by Mr. C. H. W. Biggs and Mr. W. Worby Beaumont. The leading feature is a discussion of some of the minor points which affect the successful arrangement of electric lighting plant, as the heating of the wires of dynamo-machines, internal and external resistance, comparative resistance of various conductors, lamps in series, and in multiple arc, and calculations employed in arrangement of the lamps, &c.

**Uniformity in Building and Sanitary Regulations.**—Mr. Goldstraw writes to say that the report in last week's *Builder* of the discussion at the Institute on this subject contains a slight inaccuracy. With respect to the London system of district surveyorships, he was represented as saying that Mr. Aldridge, President of the Liverpool Architectural Society, was of the same opinion as himself; whereas, he really stated that Mr. Aldridge was of the same opinion as Mr. Boulton.

**Tell's Chapel.**—The monumental decorations of Tell's Chapel are rapidly approaching completion, under the master-hand of M. Stackelberg. That gentleman calculates that his work, which has occupied him for several years, will be finished in the course of the coming summer. Thereupon, the chapel will, as soon as possible, be opened to the public, and will, doubtless, be the object and aim of many a trip to Switzerland.

**Building Exhibition in Birmingham.**—Mr. J. Black informs us that he has been induced by the success of the Building Exhibition held in London under his management to arrange for one of the same character, but more extended in scope, at the Bingley Hall, Birmingham, to take place from April 17th to May 6th inclusive.

**Life-saving Apparatus.**—An Exhibition of Means and Appliances for the Protection and Preservation of Human Life, to be held at the Alexandra Palace, Maswell-hill, is being organised. It promises to be both important and interesting. Mr. Lawrence Saunders, C.B., is the hon. secretary.

**German Evangelical Church in Jerusalem.**—It is intended, by the German authorities, to erect a new Evangelical Church in Jerusalem, and for this purpose the Emperor has approved of additional collections being made in the churches of Germany, and in other ways.

**Diocesan Architect, Oxford.**—Mr. John Oldrid Scott has been appointed to fill the post of Diocesan Architect at Oxford, left vacant by the death of Mr. Street.

## TENDERS

For Beseon sewerage, Contract No. 1. Mr. Herbert Walker, engineer. Quantities by Messrs. Hodson, Price, & Hodson:—

Mesa Brothers	£11,000 0 0
H. Lovatt	8,800 0 0
W. J. Botterell	8,777 0 0
W. Pollett	8,584 0 0
F. Dawson	8,510 0 0
J. Kitchen & Co.	8,300 0 0
A. Faulks	8,251 0 0
G. Cowdery & Son	8,208 15 6
J. Briggs	8,160 0 0
J. Coupe	7,985 10 0
Curral & Lewis	7,985 0 0
Cook, Bennett, & Shaw	7,940 0 0
T. Smart	7,881 7 2
W. Bigley	7,700 0 0
W. Holland	7,581 19 7
Hill Brothers	7,523 0 0
W. Gordon	7,500 0 0
J. W. Prockhall	7,314 15 6
A. Palmer	6,934 0 0
J. & G. Tomlinson	6,800 0 0
Sothley & Son	6,613 15 2½
Geo. Hunter & Co.	6,558 0 10
Foster & Barry (accepted)	6,205 10 6

For alterations and additions at Nos. 14 and 10, High-street, Islington, for Mr. H. F. Porter. Mr. Rowland Plimbe, architect:—

L. L. & Son	£492 0 0
W. Mead	493 0 0
F. Smith	468 0 0
Hogben & Co.	440 0 0
W. Royal	432 0 0
J. Quinry	375 0 0
Deering & Son (accepted)	347 0 0

For the erection of Tredown villa residence and stabling, Sydenham, for Mr. Sydney Smith, Mr. Pawley, architect:—

Smith & Sons	£1,186 0 0
Kemp	1,193 0 0
Smith & Appleton	1,115 0 0
Hellidge & Stuart (accepted)	1,054 0 0

For the erection of the Priory Board Schools, for the Aston School Board. Mr. Edward Monson, architect:—

Shawley & Stafford, Old Kent-road	£9,415 0 0
W. Crook-11, St. Pancras	9,000 0 0
E. F. Kealey, Uxbridge	8,976 0 0
J. Tyerman, Walworth-road	8,682 0 0
Jones & Co., Gloucester	8,390 0 0
W. Olney, Kenal-road	8,182 0 0
C. W. Cross, Shepherd's-Bush	8,085 0 0
J. Dorey, Old Brentford	8,037 0 0
T. Brunsdon, New Brentford	7,947 0 0
H. Baynes, Alperton	7,880 0 0
C. Claxide, Banbury	7,884 0 0
J. Longley, Crawley	7,588 0 0
D. Ireson, Northampton	7,546 0 0
W. H. Wheeler, Hammersmith	7,500 0 0
M. Rowles, Acton	7,424 0 0
G. Lyford, Hammersmith	7,346 0 0
C. Maton, Kew	7,299 0 0
J. Gerrard, Hackney-road	7,267 0 0
W. L. B. Beer, Kensington Park-road	7,183 0 0
J. Cardus, Acton (accepted)	6,985 0 0

For Eddington sewers. Mr. E. Pritchard, engineer.—Contract No. 2.—Cast-iron Pipes and Special Castings.

S.acey, Davis, & Co., Derby	£2,890 0 0
Batterley Iron Co., Alfreton	2,446 0 0
Cochrane & Co., Derby	2,189 0 0
J. & S. Roberts, West Bromwich	2,087 0 0
C. E. Firminstone Bros., Stourbridge	2,015 0 0
Staveley Iron Co., Staveley (informal)	—

\* Accepted.  
† Not accepted in consequence of failure to complete in stipulated time.

For new chancel, organ-chamber, vestry, and baptistery St. Paul's Church, Preston. Messrs. Myers, Vennors, & Myers, architects. Quantities supplied by architects:—

D. Tullis & Son	£2,554 4 2
R. Heathcote	2,047 5 10
J. Wainsley (accepted)	2,029 8 3

For alterations and extension of premises, Exchange Buildings, and Dorrell-place, Brighton-road, for Mr. A. Philips. Mr. J. William Stevens, architect. Quantities supplied:—

Maxwell Bros.	£1,118 0 0
Taylor	1,101 0 0
Pack Bros.	1,094 0 0
Bolding	965 0 0
Smith & Son	886 0 0
Holliday	834 0 0
Axford (accepted)	827 0 0

For sundry alterations and additions to dwelling-houses, Ladywell Park, Lewisham, for Mr. Dalton Miller. Mr. J. William Stevens, architect:—

Smith & Son	£255 0 0
Mattcock Bros.	941 0 0
Holliday (accepted)	721 0 0

For two warehouses, for Dr. Yarrow, in Old-street. Mr. Allen, architect:—

Brass	£1,817 0 0
Butty	1,619 0 0
Wall Bros.	1,489 0 0
Subey	1,435 0 0
Lawrance	1,430 0 0
Harris	1,347 0 0

For building two warehouses, Windmill-street, Finsbury, for Mr. Thos. C. Usher. Mr. J. Groom, architect. Quantities supplied by Mr. Mark W. King:—

Philips & Sisker	£5,431 0 0
Langmead & Way	4,947 0 0
Thos. Little	4,837 0 0
Couder	4,880 0 0
Stimpson & Co.	4,746 0 0
Bangs & Co.	4,600 0 0
Mattcock Bros. (accepted)	4,615 0 0

For the construction of the Aston section of the Birmingham and Aston Tramway:—

Jacob Biggs (accepted)	£5,461 18 9
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# The Builder.

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SATURDAY, MARCH 11, 1892

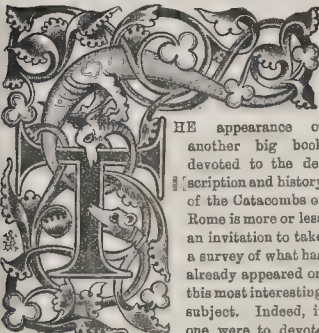
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### The Catacombs of Rome and Christian Art.\*



THE appearance of another big book devoted to the description and history of the Catacombs of Rome is more or less an invitation to take a survey of what has already appeared on this most interesting subject. Indeed, if one were to devote any considerable

space to reviewing such a work, without showing how it is but one link in a long chain, the importance of this single link would be unduly brought forward, and the readers of these remarks would be misled into a belief that the treatise in question was a singular and special work, reflecting in the solitariness considerable *cuidos* upon its compiler. Without in any way detracting from such merits as may be differently discoverable by those who study M. Roller's "Catacombes de Rome," it may be advisable to slightly touch upon some of the more important of the works which have been written about the Catacombs. In the first place, the sort of mystic sanctity popularly admitted to hang over these interesting underground cemeteries no doubt operates upon most people in such a manner that they may allow their interest to become developed in a prejudiced manner. The birth of Christianity at Rome, as a codified system with an organised body of teachers such as St. Clement would seem to indicate existed at the beginning of the first century, is somehow inevitably connected with the Catacombs. How the Christians were persecuted and sought the shelter of the Catacombs, and in the larger spaces in them conducted their services with pure and pristine simplicity, are ideas which seem to press in upon the imagination without any precise reason, but, as one might say, quite naturally. History of the Catacombs, commenced with such preconceptions only, is, no

doubt, immensely interesting, as it develops and enriches the possibly slight and shadowy base upon which it rests in the same ratio as it may seem to become unbalanced and disturbed if attempts be made to work out historical facts and probabilities into the apparently dark recesses of the still earlier past from the ascertained date of events and monuments connected with the Catacombs.

Broadly speaking, the bibliography of the Catacombs may divide itself into two sections,—one in which Christian history is the predetermined end of all discussion upon the subject, and the other in which history, unqualified by sectarian thought, may be worked as far backward as possible. The bulk of the works already published come under the heading of the first-named section. The sixteenth and seventeenth century antiquaries, Bossio and Botari, were apparently stimulated to their respective tasks as much by sectarian zeal as by the spirit of antiquarian inquiry. The learned De Rossi, 200 years later, is the generally-accepted authority upon matters concerning the history of the Catacombs, the art displayed in them, and the meaning of the symbolism which animates the art. Others, such as Lord Lindsay, Mr. St. John Tyrwhitt, the Rev. Dr. Northcote, and Mr. Brownlow have each added observations and speculations concerning the subject. In a freer manner, an American savant, the Rev. J. P. Landy, has treated the "Art and Symbolism of the Primitive Church as witnesses and teachers of the One Catholic Faith and Practice." His labours have (strange to say, perhaps) been mainly directed to collecting types of similar symbols which abound in Oriental countries, and belong to periods and religions long antecedent to Christianity or its symbolism, and of comparing them with their Christian imitations, thereby edging the opinion that Christianity as a new religious system is indebted in its ritual to many existent forms and ceremonials of non-Christian faiths. From the historic side of the question such a contribution to the bibliography of Christian art and the Catacombs is most valuable, and should encourage the birth of new considerations and reflections upon the whole subject. It is true that the Rev. Dr. Northcote and Mr. Brownlow in their two volumes,—professedly condensations of De Rossi's work,—devote a chapter to the relation between Pagan and Christian art. Following very much in these lines, M. Roller has done the same. Yorrick had a good practice of rating the merits of his sermons by little notes on the outside of them. And it sometimes seems desirable that other writers in expounding their notions should fall into a similar method of gauging their performances. For instance, in M. Roller's book, what a boon it would be to his readers had he annotated his various chapters. He might have inserted in the margin neat little headings,— "Historical," "My Own Reflections," "Rhetorical Embellish-

ment," and so forth. As it is, one frequently comes across ideas which must probably have occurred to most people, dressed out in a finery of magniloquence or presented in a sort of free-and-easy conversationalism, neither of a character encouraging to readers to pursue the task of going through the two volumes.

M. Roller explains in his Introduction the object of his labours, which have only been undertaken after many years' residence in Rome and constant visits to the Catacombs and the various remains of Christian art collected in the Lateran Museum and the Vatican. The aim of his exposition is principally the same as that of other Catholic antiquaries, and we have not discovered any marked novelty in them. They seem to be accompaniments of photo-lithographic illustrations taken in some instances from the various paintings, inscriptions, and sculptures direct. The illustrations thus are of first importance, and the erudition second. M. Roller owns almost that little, if anything, is to be added to De Rossi's work, and accordingly makes free use of the learned Italian's text, as well as many of his plates. The abridgment of De Rossi, compiled by the Rev. Dr. Northcote and the Rev. Mr. Brownlow, is plentifully illustrated with woodcuts and chromo-lithographs, and the arrangement of the text is well adapted to attract readers. Their work is published, like M. Roller's, in two volumes; but theirs are of octavo size, and not so formidable as M. Roller's big quarto tomes. The first part of Dr. Northcote's and Mr. Brownlow's "Roma Sotterranea" is devoted to History, and the second to "Christian Art." M. Roller's consists of a series of 100 chapters and 100 plates, with Introduction and *Résumé*, but, unfortunately, no index.

M. Roller, commencing with the plan of a cemetery, discusses the difficulty of making one, and accordingly gives a plate of the plan of the Catacombs and *apennaria* adjoining the western side of the Appian Way,—that is, a plan of the Catacombs, or cemetery of Callistus. Chapter II. explains the stratification and system of the "tufa" or mould into which the catacombs were cut. Tombs, galleries, and caves are next dealt with in detail. Some of these are illustrated by woodcuts, some by photo-lithographs or "heliogravures." In Chapters IV. and V. the caves or cubicles are discussed. The catacomb-makers, or *fossorens*, with illustrations of paintings of such labourers found in the Catacombs, form the matter of Chapter VI. At Chapter VII. we are introduced to instruments of martyrdom. To these succeed vases, lacrymatories, and such like, examined from the tombs, in the course of describing which M. Roller enters upon the consideration of the antiquity of signs of the cross, not mentioning, however, the use of such marks amongst pre-Christian peoples and sects. These, however, form the subject matter of Chapter LXXXVIII. In succeeding plates a fairly representative collection of the early rude little tablets, with

\* Les Catacombes de Rome: Histoire de l'Art et de Croyanances Religieuses pendant les premiers Siècles du Christianisme. Par Théophile Roller. Paris: Vve. A. Morel & Cie, Libraires-Éditeurs, 13, Rue Bonaparte, 1891.

Roma Sotterranea; or, an Account of the Roman Catacombs, especially of the Cemetery of St. Callistus, compiled from the works of Commendatore de Rossi, with the consent of the author. New edition. Rewritten and greatly enlarged by the Rev. J. Spencer Northcote, D.D., Canon of Birmingham, and the Rev. W. R. Brownlow, M.A., Canon of Plymouth. London: Longmans, Green, & Co., 1879.



inscriptions and incised symbols and cyphers, is given. Most of the originals are now let into the walls of the staircases in the Lateran Museum. Emblems—like the pair of scales, a leaf, a dove, a wine-barrel, a lion, a pair of pincers, a pickaxe, an anchor, a fish, wreaths, a dolphin—are to be seen on those presumably most ancient. Of apparently later time are those like the figure of a little man in a box, which is understood to mean Noah and the Ark, or like a man stretching his hand towards a swathed figure upright under a canopy, which signifies the raising of Lazarus. The ram and peacock also appear, and the shepherd bearing a sheep across his shoulders. This last is frequently sculptured upon sarcophagi which date from the fourth century. It is the figure of the Good Shepherd, but is, in idea and design, very similar to the pre-Christian figures of the Hermes-Kriophoros, an engraving of which is given in Dr. Northcote's book, from the original preserved at Wilton House. Dr. Northcote's lengthy argument to dissociate the Hermes-Kriophoros from the Good Shepherd fails in effect, when the representations of this subject are brought side by side. But the more successful of M. Roller's plates are those of the sculptured sarcophagi. These valuable works of art,—valuable archeologically rather than as displaying a high standard of composition, drawing, or, indeed, of stone and marble cutting,—were some time ago taken from the Catacombs and placed in the long gallery of the Lateran Museum. In these it is interesting to note the recurrence of the subjects of the Old Testament, like the Fall, Moses striking the Rock for Water, Jonah and the Whale, and of the New Testament, many of the miracles of Christ. As Dr. Northcote truly says, this collection of Christian sarcophagi, i.e., sarcophagi of the Christian era, is the finest in the world, and, *en passant*, one cannot resist expressing the hope that a few casts of some of the richer specimens,—the tomb of Julius Bassus, for instance,—may sooner or later find their way to some public collection in this country.

Some few of M. Roller's plates giving examples of the arabesque and *figura tempera* paintings, have been done by aid of the magnesian light from the originals; others are merely copies from engravings which have appeared in De Rossi's work. In some respects the chromolithographs of the wall paintings in Dr. Northcote's work are more real and satisfactory than those of M. Roller's. From paintings and sculptures M. Roller returns to inscriptions presumed to have been made by Pope Damasus; and then he takes us through a course of "dogmatic" inscriptions in which profession of Christian faith is clearly stated: as, for instance, "Young Urbica, sweet spouse, who reposes in peace in the name of Christ." These have been thought to be not earlier than the fourth century. The varied objects, such as gold ornaments glazed in circular forms or medallions, lamps, &c., to be seen in the Vatican are also illustrated. From this cursory glance over M. Roller's work, it will be apparent that an arbitrary, if not empirical, arrangement of subject has been adopted, the object of which is not quite clear. To some extent the arrangement may be considered chronological. The various aspects of the different objects are, however, interwoven; and little if anything is said upon the technicalities concerning the divisions of handicraft which the entire collection comprises. M. Roller's *résumé*, which fills some twenty pages, is perhaps the principal novelty to which he can lay claim. Throughout his work, the religious view of the subject and history, supervenes. And one regrets this all the more since it has already been skillfully handled by de Rossi and Dr. Northcote and Mr. Brownlow. Persons who have not thought much of such matters will, no doubt, be interested to learn that incidents like the Nativity, with the ox and the ass grouping themselves around the oradle, do not appear pictorially in Christian art until the fourth century. The legend which gives rise to this picturesque idea is said to have first appeared in a written form in the "Évangile de l'Enfance," by Matthias,—a religious writer who collected and wrote out many similar legends in the fifth century. The learned Christian antiquaries have remarked upon the inappropriateness of setting forth the humble origin of the Saviour of the World until such time as public opinion had sealed what is called the triumph of Christianity,—namely, in the fourth century.

Turning now to Dr. Northcote's book, we may learn that the recorded history of

the Catacombs has been gathered from old martyrologies and itineraries. The preservation of many of these ancient records is due, says Dr. Northcote, to "the exceeding care of the primitive Church in collecting and preserving a faithful record of the last words and deeds of her martyrs." The earliest quoted are those presumed to have been made in consequence of St. Clement's division "of the seven regions of Rome among faithful notaries of the Church, who should each in his own region with diligent care and zeal search out the acts of the martyrs." This act of St. Clement is assigned to the first century,—a period, in fact, when according to other historians of the social condition of Rome, the Church, as we now regard it, was virtually unknown. Its organisation was *in limine*, according to such. St. Fabian, Pope in the middle of the third century, is said traditionally to have imitated St. Clement's example in perpetuating a well-organised system of registering the events connected with the early martyrs. These statements, then, about St. Clement and St. Fabian almost lead one to feel that historic evidence of this character hangs in an unbroken chain from the first to the third century. Unfortunately, however, just as one is coming to so satisfactory a conclusion, Dr. Northcote dispenses our satisfaction by saying that these records of St. Clement and St. Fabian perished during the persecutions of Diocletian. Then he raises our hopes once more by telling us that some of the records surely escaped destruction, since Eusebius is credited with having edited a collection of them. Alas! Eusebius's edition of the Roman martyrologies is not now discoverable. However, St. Jerome may come to our aid, for he is reputed to have made a translation of Eusebius's collection. But again, St. Jerome appears to be of no use, for his work has seemingly perished. The "Martyrology," which goes by his name, published by Florentini, at Lucce, in 1688, "which is the most ancient that is extant, was compiled, and not very carefully, from the calendars of various churches, and contains therefore some repetitions, inconsistencies, and contradictions." "One compiler of this Martyrology must have lived in the time of Melchisedech, who was Pope A.D. 311-314, and another in the time of Boniface I., A.D. 418-422." It will be seen then that, at least for the first three centuries A.D., there are no contemporaneous writings concerning the martyrs and their use of the Catacombs. Tradition may possibly have been more precise in those times than in the present. But this is open to doubt. And this being so, it is permissible to question the grave precision with which the exact burial-places of possibly supposititious martyrs are nowadays indicated. About 336 to 354 A.D. it is supposed that the "Christian Almanac" was compiled, to which, in 354 A.D., Dionysius Filocalus added some "highly ornamental illustrations." Next, come inscriptions on stones set up by order of Pope Damasus on many of the supposed martyrs' tombs, and some few of which are now to be seen in the Catacombs. Goths, Lombards, and other sacrilegious barbarians destroyed many of them. The more numerous of the inscriptions now to be seen are said to have been produced in imitation of the originals, by "learned ecclesiastics or pious pilgrims of the ninth or tenth centuries." The "Liber Pontificalis" is a ninth-century compilation, by Anastasius, from more ancient documents. The statements in the "Liber Pontificalis" are often at variance with those of the Almanac of Filocalus. Similar want of agreement is found in respect of the Martyrologies of Bede (eighth century), of Ado (A.D. 875), archbishop of Vienna, and Usard, a Benedictine Monk of Paris, in the days of Charlemagne. This last-named work, it is to be observed, is the foundation of the Roman Martyrology now in use. During the Pontificate of Pope Urban, in the middle of the third century, the martyrdom of St. Cecilia is reputed to have taken place, but the acts of her martyrdom,—so picturesquely described by Chancer in his "Second Nunne's Tale,"—cannot lay claim to any higher antiquity than the fifth century. The place shown as the crypt of St. Cecilia is believed to have been a square cave, but some century or so after the presumed martyrdom was perpetrated, Pope Damasus embellished it. To his work in still later times succeeded the construction and ornamentation of the shrine by Sixtus III., and so, perhaps, the glorification of the Saint may evolve as time asserts itself, and makes more remote, the persecution of some Christian woman who died by

the hands of authorities enraged by her persistent avowal of the truth of her faith. The veracity and authenticity of the martyrologies must be full of interest to those who require to establish them beyond the region of question, but, as we have before remarked, they cannot be seriously taken as lights upon the darkness of the first three centuries' history of the Catacombs and Christian art.

The next class of ancient documents upon which writers of the history of the Catacombs have chosen to rely are the itineraries of pilgrims. These, Dr. Northcote considers, are more useful. The itineraries, like the martyrologies, do not date, however, from before the middle of the fifth century; indeed, if so early. William of Malmesbury's account of the visit of the Crusaders to Rome, A.D. 1095, contains extracts presumed to be from itineraries of the seventh century. There are similar records of later date, in which traditions concerning the saints and their relics are perpetuated, enlarged, or diminished, according to the inclination of the various compilers. In the tenth century the Catacombs had almost passed out of mind. The site of them was nearly forgotten. From that time until the fifteenth century it appears that they passed from recollection. Franciscan friars visited the Catacombs in 1432 and 1482, and left inscriptions of their visits. In 1578 a spirit of inquiry concerning these early burying-places sprang into liveliness, and instigated Alfonso Ciaconio, and two Flemings, Philip de Winghe and Joannes Macarius, to commence investigations; their writings, however, were not brought before the public in any complete or printed form. In 1593 Bossio, whose MS. work is preserved in the Bibliotheca Vallicelliana at Rome, took up the investigations of his immediate predecessors. And forty years later the first edition of Bossio's "Roma Sotterranea" was published. It is not within our present means to continue this rough reference to the various steps by which the history of the Catacombs and Christian art has become developed. We have probably borrowed sufficient indication of its progress from Dr. Northcote's work to show that there is still a wide field for others to wander over in their inquiries of such matters, and to fit them into the general history of art, which, from our own part, has the greatest interest for us.

A modern phase, tending to the popular exaltation of poets and their heroes, as in the case of Dante, Shakespeare, Browning, and Ruskin Societies, finds, if we may not be considered too secular to say so, a parallel in the creation by the Romish church of its calendars of saints and martyrs, and other similar heroic personages. Dante's Beatrice was certainly, in her prosaic reality, an actual personage. Idealised by the great poet, she becomes transcendental. In the same manner it appears that the early Christian martyrs have a real and ideal being. The ideal being is that, however, which the Romish Church has preferred to select for association with the earlier history of the Catacombs. It is no part of the present observations to enter into the merit of such associations. We make mention of it merely to invite the attention of our readers to the consideration that such legends of the Church seem to have no intrinsic value in an antiquarian and historic inquiry into the origin and use of the catacombs.

Those who seriously desire to obtain an impression of the condition of Rome during the first three centuries A.D., cannot do better than consult Gibbon's "Decline," and, with the information obtained therefrom, to understand practice in respect of burials and disposal of the dead, they may usefully mingle Dr. Northcote's observations upon early Roman tombs. The deduction, or perhaps we may go so far as to say the natural issue of reflections, from such information is, that the Catacombs in their beginning had little, if anything, to do with the first Christians at Rome. Rome, at that time, was infested with various religions. Egyptian Serapis, Persian Mithras, lesser deities, *lares et penates*, inherited by Romans from Greeks; together with Jewish tenets, Gnostic doctrines; and much else, were all in a way tolerated and in various directions influenced Roman society in its habits. Cremation, as a means of disposing of dead bodies, was used, and burial was also in fashion, restricted perhaps to the richer and select few rather than in general use by the many. Fine tombs were erected, as along the Appian Way, and relatives and friends came thither to do honour to the defunct by holding feasts at their tombs,—an early Roman form of



Christian *agape*, and of later acts of devotion done in Middle Ages and onwards at the shrines of martyrs. Crushed and kept in servile abjection as the dependents of Roman magnates might be, the spirit of consideration and kindness from time to time had opportunities for shining under the benignity of rulers like the Antonines. The wealthy, from fostering the practice of entombment and burial for themselves, gradually helped in extending it in respect of their followers and servants, and signs of wider benevolence in this particular direction are manifested in facts like that of Babina Gemellas, who purchased a large tract of land for the burial of a hundred of his poorer fellow-citizens.

Burial-clubs, as is well known, arose in Rome in the first century, and on this subject Dr. Northcote's Chapter II. of Part I. is extremely interesting. "The number and constitution of these Roman burial-clubs is a subject to which the attention of scholars has only recently been drawn. It was first broached by Mommsen; but nobody before De Rossi had pointed out their bearing upon the fortunes of the infant Church." Burial thus gradually superseding cremation, the question of sufficiency of space for the disposal of bodies and the making of cemeteries asserted itself, and evidently obtained the required attention. It is, perhaps, probable that imported Egyptian influences at Rome may have aided the development of cemeteries and burying-places, since the well-known reverence of the Egyptians for the dead, to say nothing of the crafty speculations of Egyptian priestly undertakers, or *choachytes*, had long before supplied Egypt with considerable *campi sancti* and subterranean galleries for burial.

About Rome in the first century A.D., and before, the digging-out of sand for building and other purposes had caused the formation of systems of subterranean passages, called *arenaria*. Now it is a particular point with many historians of the Catacombs to set their faces against the supposition that these *arenaria* can have been connected with the making of the Catacombs. It is, however, known that in some cases the *arenaria* have been converted into places of sepulchre. The Catacombs, as distinct from *arenaria*, are similar passages out in compact mould or earth called *tufa*, and this sort of material is evidently better adapted for underground excavations than sand rocks. In many instances old sand *arenaria* are found not only in close proximity to, but actually forming part of and interlacing themselves into, the earth-cut Catacombs. A few considerations like these seem to furnish fair grounds for conjecture that, as burial of the dead became popularised, the disposal of the corpses in disused *arenaria* at first, and then, as convenience dictated, in similar passages cut into the earth contiguous to the *arenaria*, became a recognised method of burial with Roman citizens generally. In spite of intolerance, the Christian sect, with its special tenets as to burial, arose, and the peculiar advantages of subterranean passages, not only for burials, but also for unobserved and secret accomplishment of Christian devotions, may have recommended themselves to the devotee. And in regard to circumstances favouring the growth of Christian doctrines, we may note here a few remarks of Gibbon to the effect:—"I. That a considerable time elapsed before the emperors considered the new sectaries as an object deserving of the attention of government. II. That in the conviction of any of their subjects who were accused of so very singular a crime, they proceeded with caution and reluctance. III. That they were moderate in the use of punishments; and IV. That the afflicted church enjoyed many intervals of peace and tranquillity." The poverty of the earliest underground tombs,—inscriptions and such like,—all point to a use of the Catacombs by persons either of a poor class, or without desire to introduce into these underground places any of the decorative sculptures and paintings which abounded overhead. It is not until the fourth century, when Christianity was supplanting Roman Paganism, and became formally recognised by the ruling powers, that art of pretence in painting and sculpture virtually found its way into the Catacombs. The relics of the art of the first three centuries are not of a high standard of merit. Speaking generally, it seems to belong to a poorish class of persons. In the fourth century, however, the best phase of Roman art was all but extinct, and the Roman Christians attempted, with their antecedents of

poor art, to practise more ambitious art. All that they could do at best was an art imitative of that in which they then lived. The art which, from religious and other causes, they had previously and avowedly despised, was now almost dead.

Hence, whatever likeness is possibly seen between Christian wall-paintings and those of Pompeii, Herculaneum, or the Palace of the Cæsars, there is no question of their being, *quâ* technique and grace, far inferior in quality to that of Roman art in the first century. The Christians, in truth, had lost a period of close upon 300 years, during which, had they been possessed of real ecclesiastical organisation and property, they might have come to the encour of the expiring pagan art. They might have infused into pagan art purity of thought, and who can say whether this might not have given new impulse to what had degenerated through luxurious use, and was dying through a phlegmatic temperament consequent upon luxury?

A different reason, and one propounded at some length by Mr. Lundy, for the absence of any marked demonstration in the first century of Christian symbols, paintings, and sculptures in the Catacombs, as well, too, for the selection of the underground passages for the first performances of their simple rites, and the holding of fraternal meetings, is said to lie in the "Discipline of the Secret" (*disciplina arcani*) of their faith. This discipline, Mr. Lundy seems to show, is a direct imitation of the *disciplina arcani* to be found in connexion with the mysteries of Mithras, Samothrace, and Eleusis. Apart altogether from the doctrinal direction of any such mysteries or secrets, it is to be observed that the necessity for the existence of such mysteries and secrets appears to have been felt by propounders of almost all faiths. This is much like what occurs now. With this difference, however, that the basis of any special branch of knowledge or code of rules which are believed to be likely to be of use to mankind, is at the present time set forth as simply as possible for general acceptance. Nowadays, propounders of knowledge, thanks to the almost universal sense of freedom, strive, as a rule, to place their propositions or doctrines in a clear and readily-understood shape, inviting expansion of them by any one. In earlier times, freedom was feared, and hence the necessity for mystery and secrecy. Exclusiveness in possession of doctrines acted as an attraction to those outside the circle of exclusive possessors; and, as in the case of Christianity, it was not until this attraction had operated upon a sufficiently large *clientèle* that the mystery and secrecy gradually diminished. On the other hand, jealousy of power which the assumed possession of mystery and secrecy seemed to confer upon them, the teachers of Christianity, the early presbyters and bishops, together with their chief, the Pope, maintained and exercised their right as the direct inheritors of inner tenets of the Faith, which, as people became conversant with the doctrines of Christianity, were revealed by these teachers. It is not altogether uninteresting to note that the system of monopolising secrecy found a revival to some extent in the recent annunciation of the Pope's infallibility. With his Holiness rests the power of infallibly deciding for people who will accept his decision what mystery new or old is "*de fide*."

It has been an aim with the majority of writers on Christian art to identify all inscriptions, cyphers, and symbols belonging to the earliest Christian periods with Christian significance. Scarcely a single person has generously collated the most frequently recurrent of such cyphers, with similar cyphers known to have been used by sectaries other than Christian. The materials for such a collation are abundant, and so far as we know, Mr. Lundy is the solitary individual who has made any attempt in this direction. But he, again, is more often than not led away by his own predilections for establishing the Christian meaning of symbols. The discovery of a piece of plaster rudely scratched with the body of a man, surmounted by the head of an ass, arms extended as though crucified, a little figure on the left, and the Greek inscription, "Alexamenos worships God," raises the ire of Christian antiquaries. Such a thing can be nothing else than a caricature of a most sacred subject. The Rev. Mr. King, in his work on the Gnostics, finds it to be a relic of Gnostic piety. The controversy about it has exercised such German and Italian pundits as are prone to see Christianity

in almost all symbolism or cyphers used during the first centuries A.D.

There is no doubt whatever that Pagan symbols were used by Christians. In fact, in the early days, and even as late as Tertullian, the Christians had few symbols or rites distinctively different in appearance from those of other creeds. Mr. King considers that the symbols and rites of the Mithraic religion were frequently used by Christians,—symbols and rites remaining almost the same as before, but the meaning attaching to them alone being modified by Christian thought and precept. Tertullian denounced Mithraic symbols and rites analogous to Christian symbols and rites, as the subtleties of the devil in "mimicking certain things of those that be divine," overlooking the essence of the situation that the worship of Mithras, so popular in Rome, preceded Christianity. We need not discuss why Christians should have adopted Pagan forms for the expression of their faith.

The great area of facts and fancies, covered by the history of art of the Christian period can surely be dealt with in some concise and simple form, without necessarily opening the still wider field of polemical controversy. Each inquirer may have his own peculiar opinion, as to the mysticism of signs and drawings, but this does not touch the matter-of-fact treatment of the condition of a phase of Roman art during the early periods of Christianity. What is much needed is a chronological arrangement of the remains of early art of the first three centuries A.D. carried out in some such plan as that adopted by Agincourt in his "History of Art by its Monuments." The task is no light one. Still the materials are almost to the hand of any one who feels emboldened to attempt it. With these few remarks we must conclude our observations, already too long, and yet too brief in respect of their subject, leaving the doctrinal value of Christian art a bone of contention amongst the partisans of various faiths.

#### SOME ARTISTIC BOOKS FROM ABROAD.

The commencement of the new year is always a busy season with the publishers, both at home and abroad. The public certainly cannot complain of not being supplied with ample means of acquiring information. A generation and more has passed since De Quincy's well-known calculation of the impossibility of even the most voracious reader wading through a tithe of the books, not in existence, but appearing annually. Since then the book-market has been yearly more and more active. The spirit of the present day in England seems opposed to complete and costly publications. It is the many, not the few, who have to be considered now. In the production of artistic works the Continent, it must be admitted, stands ahead of us, and the English reader is fortunate who is able to avail himself fully of the stores of information thus placed within his reach.

Let us glance at some of the many works produced abroad. Chronologically, it is certainly with the "*Histoire de l'Art dans l'Antiquité*" that we should commence; a work, which, in spite of its title, is, in no small measure, addressed to the general public by its authors, M. George Perrot, of the French Institute,—a case-hardened Eastern traveller and professor,—and M. Chipiez, whose architectural abilities largely aid the archaeological research of his *collaborateur*, and whose works on the Greek orders and on the Greek monuments in Chalcidæ are not unknown in this country. In the volume which appears this season we have the history of the parent art of Egypt, the first portion of a series to be devoted to the art of Assyria and Persia, Asia Minor, Greece, Etruria, and Rome. Much as has of late years been written concerning Egypt, it may be said that this work is the first complete and, certainly, the most recent study which we possess of the art of the land of the Pharaohs, the discovery of which so clearly revealed the origins of the long unexplained beauty of Greek art, that debt of gratitude to the East of which Winckelmann and more than one other distinguished archaeologist had but the faintest conception. Now, however, the discoveries of recent years have enabled us to sketch out, roughly after all, the history of ancient art,—of the art, that is, which preceded that of Greece. Here, in M. Perrot's volume, we have, in a form befitting the gravity of the subject, the history of Egyptian art from its earliest known commencements in Memphis,



To the first part of this comprehensive work on the art of antiquity, praise must be awarded. The illustrations are chosen with care and from authentic sources. While thus producing a work addressed to the learned, the aim of the authors is none the less to popularise the study of ancient art,—an understanding of the beauty of which, they justly argue, should be no more overlooked in modern education than is the literature of those Classic times the genius of which was so brilliantly manifested in its contemporary artistic creations. As interesting to Egyptologists, let us not forget to mention the recent publication of an excellent Italian work of reference, "Dizionario di Mitologia Egizia," by Lanzoni.

The little "Manuel d'Archéologie Grecque," which takes worthily its place among the books of the season, is one of an important series published under the patronage of the French Government, and of which four volumes of the ultimate hundred have already made their appearance. The series to which these volumes belong, "La Bibliothèque de l'Enseignement de l'Art," is published with the praiseworthy object of supplying to students and the public generally a complete artistic encyclopedia. Within the reach of every purse (the price is barely 3s. for the well-printed volume, profusely illustrated), the "Library of Art Instruction" is intended to supply an expressed want of works to serve as sources of reference to the daily-increasing class of young art students of both sexes to whom the more expensive works are not only impossible of purchase, but far too special. Let it be remarked also that the outside public are largely gainers by the erudition thus afforded in a limited space. In every case the most competent authorities have been insured in the extraordinary list of forthcoming volumes. In the course of the next four months it is to appear a fresh series of seven volumes, dealing generally with the subject of art, a *Précis* of the History of Art, Sculpture, Painting, Architecture, Engraving, Ornamentation, and Music. At later intervals we are to have a further series of special volumes on French painters, the Italian, English, Spanish, and modern French schools, ceramics, French and Italian sculpture, an artistic inventory of France, figured mythology, Etruscan and Roman archaeology, Gothic architecture, tapestry, Byzantine art, Oriental architecture, French styles, and the modern processes of engraving, with other volumes on the architecture of antiquity, of Italy, of the North; on carving, building, precious stones, bronze, costume, &c. The idea so generously conceived promises positively to work a revolution in the direction intended. The knowledge of art which will by this means be spread will, it is hoped, produce the results which it has been constantly urged would follow on the publication of a series of competent works, dealing technically and artistically with the arts, the study of which is so singularly neglected in our early education. We have come in our country to understand this, though there yet remains an opening for a thoroughly-conceived series such as M. Quatrin's "Bibliothèque Grecque" promises to prove. Of the "Manuel d'Archéologie Grecque" we may have on another occasion to speak; suffice it to say that on a small scale it is an excellent hand-book, well prepared for the object it is intended to fulfil. The size of the volume prevents any serious display; but as an excellent idea, worthy of note, each chapter is preceded by a short bibliography of works of reference, from which further information may be gained. It is delightful in a work of this kind not to find vamped up a host of the stock wood-blocks that too often do duty on these occasions. Of the 141 illustrations, except a few borrowed from Schliemann's recent works on Troy and Mycenæ, all have been specially prepared for the book. Of the other volume of the series, that on "Mosaics," by M. Gerspach, with its sixty-eight cuts, the same may be said. The reader has here a complete history of the commencement and development of this interesting and instructible art, of which Ghirlandajo so truly said that it was "painting for eternity." M. Duval's "Anatomie artistique" will prove invaluable to many a student unable to purchase the expensive works to which he is generally obliged to refer, while M. Havard's "Peinture Hollandaise" gives a clever sketch of the many painters of what he refuses to call the Dutch "school," on the score that its painters appear to have had no definite aim in view, or to have made no effort to transmit that aim to their successors, the traditions and secrets of each artist being lost at his death.

Another work, one more important, M. Havard has contributed to the list of artistic books of the season, a work entitled "L'Art à travers les Mœurs," in which the lively author who has shown us so successfully the fallacy of our belief in the fogs of Holland, traces, as his title sets forth, the position of art in the development of the world's history. M. Havard is a supporter of the now well-understood *milieu* theory, the influence, that is, of "surroundings," of contemporary feeling, civilisation, and culture on the art of each epoch. In each period, he says, "art appears as the faithful representative of our tendencies, of our needs, of our tastes"; art being, according to the same authority, the direct emanation, the exact product of a determined epoch, by means of its creations, we can unerringly re-constitute that epoch; a general rule to which, however, it may be remarked his own work affords not a few exceptions. M. Havard discusses delightfully on his theme, and produces a world of interesting information to support his views. Under such competent direction it is only what might be expected that the illustrations are as excellent as they are numerous.

Of another book treating generally of the arts it may not be out of place to speak here, of the "Grammaire des Arts décoratifs" by the lamented Charles Blanc, a work which appeared only a few days previously to the death of the industrious Académicien. This Grammar of the Decorative Arts serves as a companion volume to the Grammar of the Arts of Design, which appeared some years since; the new work is, in fact, the application to practical purposes of the rules there laid down. It is more particularly to the decoration of the house that the author devotes his attention. As may be imagined, the field is vast. In the small space at our disposal it is impossible to give any analysis of the volume; the views of the French regarding household decoration vary singularly from ours; the English reader, however, cannot fail to gain valuable ideas from the experience of so tried an authority as Charles Blanc. The decoration of the house he wishes us to regard as a duty not only to ourselves, but to our friends; and an indifference to its consideration should be regarded, in fact, as an act of impoliteness. The literary style of the work is of the same fascinating simplicity which the lamented writer was almost the first in France to introduce into the criticism and discussion of artistic matters.

Having deviated somewhat from our chronological order, let us "hark back." We jump from the very modern consideration of household decoration to the days when true decoration was still really understood, as shown in such a work as Herr Man's "Geschichte der Decorativen Wandmalerei in Pompeji," with its plates, which recall the delicate colouring of the originals. The decorative traditions are still in existence in the period which M. Röllt has taken as his theme in his work on the Catacombs, "Une nouvelle Exploration des Catacombes," a history of the art and religious beliefs of the first centuries of Christianity. It is still the chain of Classic art which is described by M. Marrast in his "Vie Byzantine au 6e Siècle," and still in a measure it is the Classic tradition that, revived by the "Precursors of the Renaissance" of which M. Eug. Muntz has so much to tell. It is a story, it is true, that is not now so unfamiliar as it was some years ago. We have learned to respect the works of these earnest pioneers in the difficult path to that ideal perfection which, in the best periods, art has always had before it. After generations of oblivion and even ridicule we now have come to appreciate the grace, the youthful simplicity, the life which breathes under the uncouth exterior of the early efforts of the artists of the Italian Renaissance among whom the architects stand out so grandly. M. Muntz, who has told us so much concerning the art of Italy, and whose name is familiar to all readers of the *Revue des Deux Mondes*, *L'Art*, and the *Gazette des Beaux Arts*, relates in his new volume the story of the revival of the Classic traditions; we are warned that it is no history of the movement, yet the reader is given an ample sketch of the extraordinary period which stretches from the thirteenth to the sixteenth century. It is, of course, with Niccolò Pisano that the artistic revival opens, the premature efforts of that Classic-Gothic artist preceding, let it be remarked, some sixty or seventy years the literary revival led by Petrarch and Boccaccio. We are presented, it is true, with no new ideas, but certainly with no want of facts, references,

arguments, and especially, illustrations. By the same author should be mentioned a no less interesting work, "Un Maçon au XVe Siècle," Art and Letters at the court of the Popes during the brilliant fifteenth century. Here, however, a whole mass of new facts have been dragged by the author from the obscurity of the Roman libraries, where his earnest search has succeeded in unearthing a precious mine of unpublished manuscripts and documents relating to the artists employed by the Popes. Another work bearing much on the same subject should not be passed over, "Sig. Bertolotti's 'Artisti Lombardi a Roma'; the industrious writer who has already told us so much of the Belgian and Dutch painters in Rome, of Benvenuto Cellini, and of Borromini the architect, has now gathered a mass of information relating to the Lombard artists employed during the last five centuries in Rome. From the days of the *magistri comacini*, Lombardy largely supplied the Papal capital with its artists, painters, sculptors, and architects, *stuccatori, intagliatori, goldsmiths, &c.*, and of these Sig. Bertolotti has much to tell.

M. Charles Yriarte has given us a new and richly illustrated work, entitled "Un Condottiere au XVe Siècle," an interesting account of the "cultivated court" of the Malatesta at Rimini, where Leo Batista Alberti built, for the famous Sigismond, his master-piece, the Church of San Francesco. Dealing with the same period, too, is M. Heiss's "Medailleurs de la Renaissance," a superbly illustrated series, commencing with that master medallist, Vittore Pisano. To that fascinating land of the arts, Italy, there are many other interesting works devoted; one deserves mention, "La Vie privée à Venise," by Signor Molmenti, a French translation of a work brimful of curious facts and anecdotes.

M. Ephrussi's superb volume on "Albert Dürer et ses Dessins," with its rare and exquisite reproductions of the drawings of the Nuremberg master, will be welcomed by all art-lovers. We have heard from many sources the incidents of the sad life of the industrious artist. M. Ephrussi has now used as his mine of research, the mass of drawings by Dürer, which are scattered over Europe. These, it is usually stated, number about 300; there are, our author assures us, over 1,200, not one of which has he failed to examine. We have reproductions in the volume of 100 drawings in the text, and thirty more on separate pages.

We find Van Dyck's life and familiar portraits, so many of which are of historical characters in our English history, the subject of a richly-illustrated folio, by M. Guiffrey, in one of the series which Quatrin has been publishing annually, and of which we have already reviewed the "Holbein" and the "Boucher." Another volume of the season presents the public with a number of spirited etchings, by M. Ungers, from the pictures of Franz Hals, the boisterous friend of the refined Van Dyck, "Bancquet d'après Franz Hals," a work, the text of which, though written in French, comes from the country of the painter. The life of Correggio proves, at the hands of Mme. Mignaty, a countrywoman of the refined Parma painter, a charming artistic study ("Le Corrège").

Germany has produced among many books deserving mention a valuable work on costume, the continuation of Herman Weis's "Kostume-Kunde," dealing more especially with the costume of antiquity, while the brothers Egger have devoted much interesting study to the life of the gifted German sculptor "Daniel Rauch"; Herr Lübke has published an enlarged edition of his "Geschichte der Renaissance in Deutschland," in which he holds up as an incentive to the modern Germans the great deeds of their ancestors.

Important additions have been made by Turgan to his valuable work on the great manufactories of France, "Les grandes Usines," while mention should not be neglected of M. Guérin's valuable publication on the Holy Land, "La Terre Sainte," its history, sites, and monuments, the work of an industrious artistic and archaeological traveller in a country fraught with even more than the usual interest that is always attached to a foreign land. Messrs. Hachette have published an illustrated modern text of the "Histoire du gentil Seigneur de Bayard"; Sig. de Amici's "Marococco" has been translated into French, and with its illustrations worthily takes its place beside M. Gourdan's "Suisse" and "Italie," and Doré's and Davillier's "Espagne." Messrs. Audley & Bowes's hand,



some work on the ceramic art of Japan has met in France with a greater success than even in our country, and Didot has reprinted the edition in a more convenient form, and with the addition of numerous illustrations. Another work on the "History of Ceramics," by M. Garnier, is worthy of note. Paul Lacroix has completed his well-known and richly-illustrated series by his volume on the "Letters, Science, and Arts of the Seventeenth Century"; and M. Clement, the art-critic, has enlarged his work,—which has already been translated into English,—on Michelangelo, Raffaele, and Leonardo da Vinci, into an illustrated volume of the greatest interest.

#### THE DUDLEY GALLERY.

THE "General Exhibition of Water-colour Drawings," which opened this week, presents no very marked feature to distinguish it from similar exhibitions of other years. It is rather strong in landscape, and if anything rather less strong than usual in figure subjects. Among the landscapes some of the best are the small works by Mr. Alfred Parsons, such as "In the May Time" (32), "Meadows by the Thames" (43), and others, presenting the characteristics of a style which is now well known in English picture-galleries; a style which owes something to Corot, though the resemblance is more traceable in the artist's oil paintings than in his water-colours. The first-named drawing is a beautiful little work. Mr. Joseph Knight's large drawing, "Lingering Light" (199), at the top of the room, is a more ambitious work in regard to subject than this artist usually paints; it represents the side of a great hill, filling up nearly the whole field of view, on which the last gleams of the evening light are thrown, while the base of the hill and the foreground are in twilight. The drawing displays those quiet brown tones with which we are familiar in all this artist's productions, and which he seems to see in every scene; it is not a powerful drawing, but it is at least a very beautiful and highly-finished one. Flanking this are two large works by Mr. Arthur Severn, "Ice on the Thames at Battersea" (185), and "Rising Tide, Sark" (203); the former a very beautiful water landscape, the latter rather a failure, owing to the very tame and mannered treatment of the sea. Mr. K. Macanlay shows us a new method in the spotty and stippled treatment of water in "A West Highland Fishing Town" (5), and "An Idle Hour at the Quay" (149), effective but rather too palpable mannerisms. Mr. A. B. Donaldson's "Old Bridge at Lincoln" (137) is a fine study of old houses and water in those warm, sometimes rather heated, tones which he affects; he succeeds in impressing us, however, with the sentiment of the scene, in which he rarely fails. He treats also the well-worn subject of "Rome from the Pincian Hill" in a small drawing (368). Among less hackneyed subjects may be noticed a fine and powerful drawing by Mr. H. A. Harper, "Jerusalem: Sunrise" (265), showing the varied piles of the holy city, partly lighted by the rays of the rising sun, the whole looking as if the buildings had been tumbled together by some incomprehensible caprice. Mr. Pilleau's small drawing, "The Two Colossi, Thebes, during an inundation of the Nile" (263), is a very delicately-toned and aerial little work, very small in scale, but not without solemnity of effect: the two colossal blocks, reminding one of the description of the giants in Dante's "Purgatorio," rise out of a waste of water that has overflowed the land round them. A drawing, called "Clover" (401), by Mr. Max Lucy, a name new to us, deserves notice; it is a scene in which a clover field, rising from the foreground to a high horizon in the middle distance, is the principal subject, crowned at the highest point by a group of trees. "Oak Valley, Cannock Chase," by Mr. Birtles (259), is a very beautiful little landscape, remarkable especially for the soft aerial tone of the distance. In a grander key, though on a small scale, is Mr. H. Moore's "Glen Dochart, Late Autumn" (85), a dark Highland scene, with a cold snow-covered hill-side in the background, the scale and perspective of which are very finely given. Among other landscapes may be mentioned a very fine, free, powerful work, by Mr. Edwin Ellis, "Sand Hills, North Wales" (38), recalling the style of David Cox; "A Trout Stream," by Mr. W. G. Addison; "An Invitation to Dinner" (54), a landscape with two figures, those of a woman and a duck, the general effect in which

is good, but the trees are too much in the "sea-weed" manner which some landscape-painters now affect; the "Marsh Mill" (103), by Mr. A. W. Weedon; "By the Wayside," by Mr. W. G. Addison (161); "On the Ouse, Bromham," by Mr. R.W. Fraser (424), a drawing very faithfully rendering the appearance of that sluggish but in its way pleasant river, with its borders of pollard willows; and in the centre of the screen is a study of foreground, boulders and the stumps and stems of trees, entitled "In the Pass of Killcrankie" (611), by Mr. Raskin, which strikes us as deficient in the facts of local colour and texture,—the realism, in short, which alone can render such a subject really interesting; we have seen much better artist's work by Mr. Raskin than this.

Among the drawings in which figures play an important part is a really original and clever one by Mr. A. Melville, the "Interior of a Turkish Bath" (181). The treatment, from an artist's point of view, of scenes of everyday life such as this is always interesting when well done; indeed, we have not nearly enough of it, and this is exceedingly well done. The hot, dimly-lighted interior, with the circle of figures in placid and luxurious ease, is made into a most effective picture, somewhat unusual in manner and tone, and reminding us a little at first glance of some of the Eastern interiors and other scenes by Anatole de Beaulieu. Mr. Joseph Clark has a pleasant little picture, a cottage-door scene, under the title "Good Night, Father" (39); and Mr. Dollman's "Les Misérables" (138), may be grouped or contrasted with this. It is a cottage exterior, where a man and his dog have been eliminated from the cottage on washing-day, and compelled to take up their quarters outside. The man has his pipe to partially console him; the dog is not so fortunate, and his expression constitutes a bit of canine humour, or humour in canine painting, as good in its way as Mr. Caldecott's dogs in the illustrations to a well-known nursery rhyme. Miss Linnie Watt's "Far from the Madding Crowd" (258) shows a very graceful and natural figure of a girl resting on the ground in the seclusion of the wood, and the landscape is as good as the figure. Of Mr. Arthur Stock's two companion works, "Raising the Ghost" and "Laying the Ghost" (303, 321), the ghost being of the old sheet and turnip-lantern variety, the first hardly seems a good enough joke to have been worth painting, but in the second the contrast between the irate face of the master with his cane, who has "laid" the ghost, the frightened perpetrator of the deed, and the half-human expression on the overthrown turnip-lantern, is amusing enough, and well worked out. "Mothers' Meeting," by Miss Caroline Paterson, a small drawing of two young girls with their dolls, is both very well executed and marked by very delicate humour. There are other more or less pleasant figure subjects, but none that are particularly noteworthy. In landscape, however, there is more of force, vigour, and variety of style, and less of mannerism, than is sometimes the case in this exhibition.

#### THE RIGHT OF SUPPORT TO BUILDINGS BY BUILDINGS.

THE now famous case of *Angus v. Dalton*, or rather *Dalton v. Angus*, as it actually is in its latest and most important stage, namely in the appeal to the House of Lords, has quite recently received a supplement in the decision of Vice-Chancellor Hall in the case of *Lemaître v. Davis*, 50 *Law Journal*, Chancery Division, p. 173. In *Dalton v. Angus* it was settled once for all that the owner of buildings has a right of support for such buildings from the adjacent land when they have been in existence for a period of twenty years. This conclusion was, as some of our readers will at any rate remember, arrived at on different grounds by the judges who advised the House of Lords and by the judicial members of that House themselves. Lord Selborne distinctly and boldly gave it as his opinion that the right to support was a right within the Prescription Act, and therefore that twenty years' enjoyment gave an absolute statutory right to support. Lord Blackburn, without denying that the Lord Chancellor's opinion was correct, yet based his judgment on the ground that an enjoyment of the right for a period of twenty years gave the owner, so to speak, of such enjoyment a prescriptive title to the right to support; and among the judges Mr. Justice Fry came with

regret to the conclusion that a long series of judicial decisions had so formulated the law as to make it impossible to hold that twenty years' enjoyment did not give a right, though such law was based on no principle at all. Such, then, was the case of *Dalton v. Angus*, to which Vice-Chancellor Hall has just added a very important and legally logical sequel.

The result of *Lemaître v. Hall* may be stated in half a dozen words. It was therein judicially decided that not only does an enjoyment of support for twenty years give buildings a right to such support from adjoining land, but also from adjoining buildings as long as such enjoyment has been neither secret, nor by force, nor discontinuous. This, it will at once be seen, is the most important development of the case in the House of Lords, and one which may have important practical consequences. As Vice-Chancellor Hall truly says, it is impossible to find a distinction in legal principles between the right to support from land for buildings and from buildings for buildings. The right of support by land to land, which it was decided long ago was a right given by English law, is one which differs from the right of buildings to support from adjoining land, because the former is a natural right which attaches to the possession of the land. But a right of support to buildings is a different right in its inception, being of a quasi-artificial character, and therefore whether it be land or buildings by which buildings are supported matters not. If the owner of buildings obtains a right to support from his neighbour's land because the land has supported his buildings for twenty years, and whether it is held that this right arises from the operation of the Prescription Act, or from actual enjoyment, whether founded on the fiction of a lost grant or not, or from the actual state at which English law has arrived, equally also if it be buildings which have supported buildings, the right must be created. Vice-Chancellor Hall, in his judgment in *Lemaître v. Davis*, seemed to consider he must rest his opinion on the fact that Lord Selborne held that the Prescription Act applied to such a right as the one in question. It does not seem necessary to make the right depend solely on the operation of this statute. As long as there is no logical and legal distinction between the right to support from land and buildings, the conclusions of the House of Lords in *Dalton v. Angus* must be applicable, whether based on the ground stated by Lord Selborne or the other members of the Court.

But there is, as it seems to us, a distinction of some practical importance between the case of support from land and support from buildings. In *Angus v. Dalton*, Lord Selborne stated that against such a servitude as that claimed in the case before him the owner of the adjoining land "has his own remedy, if he chooses to prevent and interrupt it. That power of resistance does, and must in all such cases, exist. They (the servitudes) can always be interrupted, and that without difficulty or inconvenience, when a man wishes and finds it for his interest to make such a use of his own land as will have that effect." Soon after the House of Lords delivered their judgment, in our comment on it we pointed out that such interruptions as the Lord Chancellor points to were, in the case of support from land to buildings, by no means so easy as he seemed to think, and that to let down your land, and so let down your neighbour's house, was quite a different thing from putting a hoarding in front of his window or a bar across a pathway. Now this objection is still more forcible in the case of support from buildings. Mr. Justice Fry, in the course of his interesting opinion, says, "Is the support of the house by the adjoining soil preventable? I think not. It is, of course, physically possible for one man so to excavate his soil as to let down his neighbour's building, and a man may or may not have occasion to excavate his own land for his own purposes, but such an excavation for the sole purpose of letting down a neighbour's house is of so expensive, so difficult, so churlish a character, that it is not reasonably to be required to prevent the acquisition of a right," and he thus proceeds: "In fact, in the case of adjoining houses it would be to require a man to destroy his own property in order to protect his right to it." This, more forcibly than we can put it, sums up the practical objection to this recent development of *Dalton v. Angus*: to prevent the acquisition of the right it requires "a man to destroy his own property in order to protect it." It must be confessed this is somewhat a



*reductio ad absurdum* of the doctrine of the House of Lords; but it must also be confessed that it is a perfectly logical conclusion. In the case before Vice-Chancellor Hall, the actual building was a cellar belonging to an inn called the Mitre Tavern, and it, together with the wall of the tavern, was injured by the support from the adjoining buildings being taken away in the course of their demolition for the purpose of improvement. In such a case as this it seems difficult to see how any practical step can be taken to prevent the acquisition of the right; for whether it is worse to destroy your own building to prevent your neighbour gaining a right which may at some future time be a cause of grave inconvenience to you, or to let such right be gained, and take the chance of its never being burdensome? It may, perhaps, be said, that if you threaten your neighbour, then, unless he will admit that he only has the right to support by your permission, and only for so long a time as you choose to let him have it, you will destroy your own building so as to prevent the acquisition of the right, he will at once make the required admission. But experience must have sufficiently shown us that there are scores of persons who, knowing the grave inconveniences and the great expense which must attend the carrying out of such a threat as this, will refuse to make any such admission, and trust to the inconvenience and expense preventing their neighbour from carrying his threat into force. There are, of course, other and well-known arguments to be urged on the other side, especially that it is expedient that a right after being enjoyed for a certain time should become absolute. Into these we do not propose to enter, they are at the bottom of all kinds of prescriptive titles, whether to light, to roads, or to the absolute possession of landed property. But it was impossible, in commenting on and pointing out this important extension of the doctrine finally fixed as a part of the positive law of this country, by the case of *Dalton v. Angus*, which is caused by the judgment of Vice-Chancellor Hall in *Lemaître v. Davis*, not to show at the same time the grave difficulty which exists in preventing the acquisition of this right. The difficulty was noticed in *Dalton v. Angus*, and was deliberately considered to be one which did not overrule the more important benefit of a prescriptive title to the right to support from land. It possibly may have to be considered by the same high tribunal at some future day in relation to the support of buildings, but meanwhile, as long as *Lemaître v. Davis* is good law, building-owners must submit to it as best they can.

#### FIFTY-SIXTH EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THESE exhibitions depend, in a great measure, for their attractiveness upon pictures which have been formerly exhibited elsewhere, many of them being works of Members and Associates of the Academy, and these frequently their most important productions. This year there are fewer large canvases than usual, and although examples of the handiwork of Millais, Alma Tadema, and others, have graced former exhibitions, there are none such in the present one.

Mr. Lockhart's brilliant and effective "Cid and the Five Moorish Kings," which held the place of honour at the last Manchester Exhibition, holds a like position here, and there is a portrait of the artist by Mr. Pettie, a head in profile, upon an heroic scale, in which the strongly pronounced colouring that characterises the works of the sitter has been emulated by the painter of his portrait. It is a *tour de force* in oil colours upon canvas, such as is more usually produced in the form of a bas-relief in bronze.

Mr. Hugh Cameron's "Funeral of a Little Girl on the Riviera," is the most important work he has produced, and is to form one of the permanent attractions of the Dundee Public Gallery. For simple pathos, purity of colour, and rendering of open-air sunshine, it holds a high place, and it is remarkable for the absence of that forced exaggeration of colour, detail, and texture which is apt to be engendered by the desire to catch the eye in a public exhibition. Mr. MacWhirter exhibits a very attractive view of "A Valley by the Sea," in which birch trees (which are his speciality) appear in combination, with a foreground of ferns and brushwood, where hares enjoy a respite from persecution. In the distance appears a village, and beyond

an expanse of sea glittering in the warm summer sunshine.

Mr. Colin Hunter's "In the Gloamin'," affords him scope for the rendering of the rippling surface of an arm of the sea touched by the last gleams of sunshine, upon which appears a flotilla of fishing-boats, the broken reflections of which are deftly rendered. The scene is closed by an amphitheatre of purple hills against a glowing sunset.

Mr. H. F. Lawson's picture, entitled "Her Father's Home," representing a poorly-clad flower-girl peering into a church, where the rite of baptism is being performed, is not without suggestiveness of the kind found in periodicals of the good type; but it is larger in scale than the subject seems to call for, the figure is rather loosely drawn, and the pervading tone of colour is an unpleasant yellow.

"The Monk Painter," by Max Michael, may be accepted as displaying mastery over technical details, effective composition, and rich combination of colour; but it has little interest otherwise.

Mr. MacTaggart continues to paint for distant effect; or rather, we should say, for his work to be looked at from a distance, and when so observed, "Away to the West" fuses into a rich effect of sea lighted up by bright sunshine; and the children dabbling in the water are as clearly defined as they would be if the spectator had the sunshine fall in his face. There is more labour and skill required in producing these formless details than may be generally supposed, — it is the artist's ideal. He can be definite enough when he chooses.

A similar effect is aimed at by Mr. Otto Layde in "Off and Away," — children sliding down a sand-bank; but the result is not the same. The local colour in the faces of the children is hot and crude, the sand-bank seems to be composed of mud and sea and sky, and looks painty even from the other side of the room. The composition, however, is good, and the action spirited.

The group of rustic "Labourers Resting," by Mr. Robert McGregor, is rendered with charming simplicity and truthfulness, both as regards character and effect. None of the group appears to think of anything but self, excepting the young mother, who snatches the first moment of respite from toil to attend to her infant. Mr. J. Watson Nicol seems to be falling into a careless habit, as appears from his principal contribution. "If this be Vanity would be Wise," representing a cavalier about to smother a kiss from a sleeping beauty; it is essentially a subject for costume painting, but neither in texture nor colour are the draperies well rendered. Mr. Nicol is capable of better things, as appears from his other picture, "The Malignant," which aims higher as to motive, and is better as regards execution.

Mr. James Archer has well utilised his autumn holiday by depicting a "Moor under Ben Vrachie," a desolate expanse of brown heath, with much impressiveness. We congratulate Mr. Archer on his work. Mr. Beattie Brown has made a start in a new direction; his "Noontide after the Storm, in the Valley of the Spey," a river overflowing the meadow land on its banks, is freshly treated, and has a good sense of air and distance.

Mr. E. Gavin continues to represent graceful Moorish maidens, and she at the "Holy Well" is one of the most graceful, and the picture, as a whole, is a fine combination of colour. Nearly as good in colour, but very different in subject, is that entitled "The Flower Mission," where two handsome healthy girls, just budding into womanhood, gladden the eyes of a boy in a sick ward by presenting to him a bouquet from a basket of flowers.

Mr. R. Herdman's "Antigone" displays his usual refinement of execution and feeling for deep and new colour. The expression of the lady's face is subtle and indicative of the emotion she experiences; but she is a modern Englishwoman (of a refined type, doubtless), and not an ancient Greek. This produces a feeling of unreality which is destructive to the thorough enjoyment of the excellent qualities of the work. The irrepressible Prince Charlie appears here, under the patronage of Mr. W. B. Hollis. He is represented in consultation with a few of his adherents after the defeat of Culloden. In grouping, colour, and light and shade the artist is seen at his best. The subject is a somewhat hackneyed one, but it is here treated in a more realistic than romantic manner. Another incident from Scottish history is given by Mr. James Hamilton, "James IV. and Princess Margaret." The queen is exhibit-

ing her skill on the lute, while the king listens on bended knee, the ladies of the Court being grouped around the seat of the performer. This group shows skillfulness of arrangement, but the king seems to occupy too isolated a position. Mr. Hamilton has made a bold stroke, and appears to have good stuff in him. May he go on and prosper. Mr. Clark Stanton is both sculptor and painter. His "Peg Woffington's Portrait" is a very effective bit of genre, in which the situation is well hit off.

There are in the galleries an unusual number of good portraits, amongst which we note Sir Bartle Frere, Duncan McLaren, late M.P., J. A. Froude, and others, by George Reid; Dr. John Muir, by J. H. Lorimer; Sir William Collins, by Robert Herdman; Samuel Cousins, R.A., by Frank Holl; Lady Colquhoun, by Norman Macbeth; Mrs. Lawrie, by William MacTaggart; and Sir Theodore Martin, by James Archer.

#### THE STUDENTS' DESIGNS AT THE INSTITUTE.

THE room at the Institute of Architects has been filled during part of this week with drawings sent in competition for the various prizes which, as elsewhere mentioned, were awarded at the meeting last Monday. They exhibit a great amount of labour, but not in all cases an equally satisfactory evidence of thought or consideration applied to the real ends intended to be promoted by the competitions. The drawings submitted for the late Sir W. Tite's prize for designs in the Italian style were not considered by the Council to be such as to justify them in awarding the prize at all; and, with every kind disposition towards the students, we cannot but concur in this decision. The designs submitted for this prize are, in fact, so much below the average of merit in the other cases, that we see in them evidence of a decided indifference on the part of the rising architectural generation to the style the study of which Tite desired to encourage. This is to be regretted. The type of architecture which is now included under the term Italian is one which is peculiarly worthy of study, not only because it has produced what in many ways may be called the most suitable style for town buildings of the higher class, at once stately, elegant, and applicable to the practical wants of modern life, but also because it is a style of architecture full of suggestions which may very well be worked out into new forms, and afford the basis for a good deal of really original treatment. That so many young architects should be content to run after and to copy baldly the poor and *rococo* detail of the Queen Anne style, and that they should turn away with indifference from the far more refined ideas and details of Italian architecture, seems to indicate a great want of feeling for the distinction between refinement and debasement in architectural style.

We do not draw this latter contrast, it is true, from the drawings actually sent in to the Institute, as Queen Anne style, *par excellence*, is conspicuous by its absence in this year's designs. We only compare the number of Queen Anne designs to be seen constantly in professional competitions, often obviously by clever young architects, with the indifference to the suggestions of Italian architecture, of which the Tite competition this year is only one instance. In the award made in the principal competition, — that for the Soane Medallion, — we are somewhat startled by an apparently spasmodic reaction in favour of the most violent and "wolfish" type of Gothic. The perspective view of the prize design, considering that it is for a town clubhouse, looks at first sight like a sombre kind of joke. It represents a Gothic building of the wildest type, in the midst of a Gothic town of the wildest type, bristling with towers and turrets, and so shaded as to convey the impression at first that large quantities of ashlar facing have come off in great patches, leaving the brick backing visible. Were this design publicly exhibited as the one which the central body of architects had selected as most worthy of praise among designs for a town club, we much fear that the irreverent public would indulge in some of that jeering which it is now so fashionable to indulge at the expense of the much-misunderstood and maligned profession of the architect. There are, however, two sides to the matter. In bestowing the Soane Medallion, the Council of the Institute have also to consider as to the bestowal of the legacy of fifty pounds to assist the student in travelling and studying architec-



ture, and we understand that the award was made under the feeling that, *outré* as the selected design is in character, it nevertheless showed more force and originality, and in some respects better planning, than any of the others. On examining the designs generally, we admit that we should have some difficulty in deciding what other could be fixed upon for the prize. After eliminating some decidedly youthful and feeble designs from among the fourteen, the remainder which could have been considered at all in reference to the prize are exceedingly deficient in originality, and present very ordinary and sometimes very defective plans. Had the decision gone by the external architectural effect only, we should certainly have preferred either "Union" or "Pall-mall" for the prize. The latter, which has a medal of merit awarded to it, is a Jacobean design, with large bays running through all the stories, and very effectively treated, and it certainly combines picturesque effect with sufficient suitability of style for its object. "Union" is a late Decorated Gothic of domestic type, with square-headed transomed windows, and is a very pleasing building in general effect. The plans in both are defective in arrangement: in "Pall-mall" the lavatory is on the second floor, and the windows are too small. The plan of the selected design, "El Dorado," is superior in compactness and general arrangement to these, and would be also a more effective interior. The author of it shows a great deal of ability, and if he will give more attention to the practical side of architecture, and learn not to regard it as an excuse for indulging in wild and grotesque grouping, he may very likely, at a more advanced period of his studies, show that the choice of the Council has not been a misplaced one. Still, while there is so much complaint being made as to the impractical character of the architectural profession, and efforts to turn the tide of study into a more practical direction seem to meet with so little success, we certainly regard it as unfortunate that the Institute should have appeared to directly sanction this kind of picture-making, however cleverly displayed; they might have possibly done better to withhold the prize, as a practical indication that none of the competitors had shown a proper appreciation of the problem put before them.

Of the drawings submitted for the Institute Silver Medal, the one to which the Medal is awarded is far away the best; and the other two, in fact, have no claim to compete with it. The building illustrated is St. David's Cathedral; the other two competitors furnish drawings of Old Shoreham Church and Stokesley Castle respectively. The drawings look as if care had been exercised in regard to correctness, but they are rather tamely executed.

The Grissell Medal is one of the few direct encouragements which are given in the Institute to purely practical architecture; in this case the subject is the design for a bridge. The prize in this case also, admits of no dispute; the author of it has gone into the construction of foundations, abutments, and roadway with much more attention than is exhibited in any of the other designs, and his work is remarkable for beautiful and accurate drawing also. He adopts an elliptic arch of large span and very flat crown,—dangerously flat if the bridge were on a large scale; but he has appreciated the practical requirements in such a case by the provision of a wide central waterway. The Gothic design by another competitor, with narrow pointed arches springing from very near the water level, looks well enough, and resembles in these particulars many picturesque though inconvenient old bridges; but it would be absurd to submit such a design for a navigable river now; no one would accept it; it would be regarded as practically choking the navigation. Such a bridge now-a-days would be too truly, according to the author's motto, a "*pons asinorum*."

**The Architects of the Oratory.**—One of the gentlemen named as the architects of this building in our notice last week, requests us to say that the other gentleman mentioned is not associated with him in the work; but as the other gentleman, not many weeks ago, writing in the name of both, requested us to state that the building was under their joint care, we must allow them to establish their special rights in some other way. There has been a mystery about the affair from the commencement, and we are not concerned in unravelling it.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS: PRIZES.

At the Special General Meeting, held on the 6th March, Mr. Horace Jones, Vice-President, in the chair, before the business of the evening commenced the Chairman invited the meeting to direct the Secretaries to convey to the Patron of the Royal Institute of British Architects, her Most Gracious Majesty, a dutiful assurance of deep thankfulness that it has pleased Almighty God to preserve the Queen's life in the midst of great danger, a life deservedly dear to every British subject no less than to the Members of the Institute, and to humbly express a hope that the Queen's life may be long preserved to the benefit and happiness of her people. This having been carried by acclamation, the Hon. Secretary announced that—

Arthur John Gale, Associate, had been elected by the Council to hold the Godwin Bursary for the current year, and that he proposed to travel in America.

It was resolved that, subject to Her Majesty's gracious sanction, the Royal Gold Medal for the year 1882 be presented to Baron von Ferstel, Architect, Hon. & Corr. Member (Vienna).

**The Tite Prize (Value £30).**—The Secretary announced that, in consequence of the inferior character of the designs and drawings submitted this year for the Tite Prize, the Council had decided not to give the Prize. The number of competitors was four.

**The Grissell Medal.**—Subject: A Stone Bridge. List of Competitors: No. 1. Device: the "*Pons Asinorum*"; No. 2. "*Imperishable*"; No. 3. "*Juvat impigros Deus*"; No. 4. "*Ad valorem*"; No. 5. "*Periander*."

The Secretary announced that the Council had awarded the Grissell Medal to the author of the design (No. 2) bearing the motto "*Imperishable*"; and that the Council regretted their inability to award a Certificate of Honour to the author of the design (No. 5) bearing the motto "*Periander*." This name and address of the successful candidate were found to be:—H. Phelps Drew, 17, Salgrave-road, West Kensington-park, W.

**The Soane Medallion and Fifty Pounds.**—Subject: A Design for a West-end Club. List of Competitors: No. 1. "*El Dorado, Yo hé Trovado*"; No. 2. "*L*"; No. 3. "*Peckaniff*"; No. 4. "*Che sarà, sarà*"; No. 5. "*Renaissance*"; No. 6. "*Pall Mall*"; No. 7. "*Tempus fugit*"; No. 8. "*Union*"; No. 9. "*They dreamt not of a Perishable Home who thus could Build*"; No. 10. "*Mediocora Firma*"; No. 11. "*Dispatch*"; No. 12. "*Gamma*"; No. 13. "*Work and Despair Not*"; No. 14. "*Mousie*."

The Secretary, having read the recommendations of the Council respecting the award of the Soane Medallion and (subject to the usual conditions) £50, stated that the Committee for Medals and Prizes had specially reported thereon, and that the Report, which had been adopted by the Council, was as follows:—

Your Committee have to report that, although the number of Competitors (14) for the Soane Medallion this year is larger than usual, the practical qualities of the designs as regards the distribution of plan do not carry out the recommendations of the Council, viz.:—"That the candidates should apply themselves to the useful and practical embodiment of the specified accommodation," and in those plans where an attempt has been made to grasp the special requirements of a West-end Club, the elevations show a want of that dignity, breadth, and, it may be added, character of design, which should distinguish a building of that class. Having arrived at the decision that no one design embodied, in plan and elevation, the requirement asked for, the Committee proceeded to re-examine all the drawings, to see which of the competitors had displayed the greatest amount of thought and study on the whole design, and they arrived at the conclusion that the design marked "*El Dorado, Yo hé Trovado*," though wanting in the character usually ascribed to a West-end Club, displayed so much thought and study and so much originality and talent in the design of the elevation, section and perspective, that they recommended its author to be the recipient of the Soane Medallion. The Committee further recommended that a Medal of Merit be awarded to the author of the design bearing the motto "*Pall Mall*," as having produced a carefully studied plan, and an honourable mention to the design bearing the motto "*Union*" for considerable merit in the perspective drawing. The Committee regret that the design bearing the motto "*Dispatch*" was not completed, so as to have given it a chance in the award.

Whereupon it was resolved—That the Soane Medallion and (subject to the usual conditions) £50 be awarded to the author of the design

(No. 1) bearing the motto "*El Dorado, Yo hé Trovado*." The name and address of the successful candidate were found to be—Arthur Beresford Pite, 44, Bloomsbury-square.

Resolved—That a Medal of Merit be awarded to the author of the design (No. 6) bearing the motto "*Pall Mall*." The name and address of this gentleman were found to be—Leonard Stokes, 13, Holland-street, Kensington, W.

Resolved—That a Certificate of Honour be awarded to the author of the design (No. 8) bearing the motto "*Union*." The name and address of this gentleman were found to be—G. H. Shackie, 8, Great Marylebone-street, W.

**The Institute Silver Medal and Five Guineas: Drawings.**—Subject: For the best illustrations, drawn from actual measurement, of any important building—Classical or Mediæval—hitherto unpublished in that manner. List of Competitors:—No. 1. "*Spes*"; No. 2. "*Grosvenor*"; No. 3. Device of a Leaf.

Resolved—That the Silver Medal of the Institute and Five Guineas (Drawings) be awarded to the author of the drawings (No. 2) bearing the motto "*Grosvenor*." The name and address of the successful candidate were found to be—Thomas T. Scott, 14, Bank-street, Carlisle.

Resolved—That a Certificate of Honour be awarded to the author of the drawings (No. 3) bearing the device of a leaf. The name and address of the successful candidate were found to be—R. Elsey Smith, Laurel Bank, Forest Hill.

With reference to this award it was subsequently resolved—That, in future, the sum of Ten Guineas (instead of five guineas) be annually given with the Institute Silver Medal for measured drawings, and that, in the present instance, an extra sum of five guineas be presented to the successful candidate, Mr. Thomas T. Scott.

**The Institute Silver Medal and Ten Guineas: Essays.**—Subject: The stall-work, canopies, and rood-screens of the fifteenth century (English only). No. 1. "*Perseus*."

Resolved—That the Silver Medal of the Institute and Ten Guineas (Essays) be not awarded this year, and that the same subject be given next year.

#### PROPOSED AMENDMENT OF THE METROPOLITAN BUILDING ACT.

##### CURIAL CONTENTS OF WAREHOUSES.

At the meeting of the Metropolitan Board of Works on the 3rd inst., the following report was presented by the Building Act Committee:—

"Your committee have to report that they have considered the letter from Mr. R. D. Dalby, chairman of the Fire Offices Committee, expressing a hope that the Board will consent to withdraw the 19th Clause in the Metropolitan Management, Building, and Floods Prevention Acts (Amendment) Bill, referred by the Board on the 27th of January last. This clause gives the Board power in certain cases to authorise the construction of warehouses or other buildings used for the purposes of trade and manufacture, containing more than 216,000 cubic feet, without divisions by party-walls. The Fire Offices Committee have submitted to your committee, who were authorised by the Board to confer with a deputation from that body, that any increase in the curial contents of buildings of this description would be fraught with great danger to the public, and would increase the expense of fire extinction in the metropolis. Your committee, having fully considered the representations made to them, are of opinion that the clause in question should not be proceeded with, and they therefore recommend that the Solicitor be instructed at the proper stage to take measures for the withdrawal of the clause from the Bill."

Mr. Deputy Saunders, Chairman of the Committee, moved the adoption of the report.

Mr. Richardson thought the Board should decline to withdraw the clause in question. If they were beaten in Parliament, they could then withdraw; but after the attention and consideration that had been given to the subject, the Board ought not to give way at the first sign of opposition.

It was pointed out by several members, however, that the retention of this clause might imperil the passing of the other portions of the Bill; and Mr. Freeman said he was afraid that this was one of the cases where they must stoop to conquer.

The motion was carried.

**The National Standard Land Mortgage and Investment Company (Limited)** notify that they have declared an interim dividend at the rate of 5 per cent. per annum.



## CONTINENTAL GATHERINGS.

WHAT in Paris has long been a hotly-discussed point, has at length been decided,—the remains of the Palace of the Tuileries are to be removed. What portions of the ruins can be preserved will, of course, be respected; a specially-appointed commission is at present considering the question. Many of the fragments will doubtless be used as suggestive decorations in the gardens, while the architectural details of more artistic merit will be removed to one of the State museums. Experts fear that, what with the fire and the ten years' subsequent exposure to the weather, the stone will be in a sad state of crumble; indeed, an idea of the probable eventual appearance of our Houses of Parliament may be obtained by an inspection of some of the portions of the now doomed Tuileries. Since the terrible night when the great clock stopped, its hands staying ever since that memorable 23rd of May at ten minutes past nine, the ruins of the once brilliant palace have been open to wind and rain; the sparrows flit about the golden walls and perch on the twisted sconces of the *Salle des Maréchaux*; the shutters are torn from their hinges; the red and black splintered stone crumbles slowly away; the whole has the desolate appearance with which we are all familiar of a house that has been burnt clean out. Of Catherine de Medici's palace, what little was left by the restorers is now gone; the central pavilion, which is the least injured, is, by good luck, perhaps, the only existing portion of the original plan of Philibert de l'Orme, to whose work successive generations have added on what had come to be known as the Tuileries. Now, however, the whole will disappear, and few will regret that so sad a reminder of the terrible reign of the Commune as the ruins now preserved in the midst of re-built Paris and its gaiety will thus be removed, to leave only the recollection of the fame of a palace which, strange to say, till within a century has been little occupied by French royalty.

From the lagoons comes a disagreeable intimation. The Church of Sta. Maria della Misericordia, long sadly desecrated, is threatened with demolition. A lengthy lawsuit respecting the ownership of the church, lying between the Government and the Moro family, has been settled in favour of the latter. They have immediately, it is stated, offered the whole for sale, with its interesting objects of art, not least curious among which are many tombs of the ancestors of the family, the same to which is attached the Venetian legend handed down to us so inaccurately in "The Moor of Venice." The church having been commenced by the united families of Giolli and Moro somewhere about the middle of the tenth century, there have naturally been great alterations. The seventeenth century laid heavily its hand on the old church, in the shape of a façade; but into so sad a state had the old building fallen that about sixty years ago the restorers had to be called in. Damp and neglect had worked their usual havoc, a few pictures still remained, one by Cima, a number by Bonifazio; there was also the tomb of the fourteenth-century Captain Jacopo Moro, the work of Bartolommeo Bono, the artist of the beautiful series of capitals of the columns in the arcade of the Ducal Palace. Some thirty years since, the church and its various curiosities were set in order and preserved from further injury. The whole has now been sold by the owners, and who can say how far the mercenary zeal of the dealer may go? It is urged that the law, in the interests of art and of Venice, should decide what objects belong to the family and what to the nation. It is a difficult question; the Venetian aristocracy, with their centuries of pedigree, are poor, and the antique code of honour and pride has sadly relaxed in these degenerate days. Our contemporary *L'Art*, in its issue of January 15th last, gave a sketch of the church, accompanying a letter from the Count Zarzi, of the Museo Correr, and whose name will be remembered as having been foremost in the outcry against the proposed restoration of St. Mark's.

When is Italy to cease to amply us with its envied artistic treasures? Two sales are announced to take place in a few weeks at Gubbio, in one case the collection of the Marchese Ranghiesi-Biancaleoni; pictures, statues, majolica, arms, jewelry, &c., all the choicest products of the Italian art industry of the past. As a supplement another nobleman of the same town has announced his intention

to relieve himself at the same time of his family pictures.

Recent ministerial changes in France have retarded many excellently-commenced plans. None surely was of greater promise than the creation of a special school for the formation of museum officials, the school to be placed under the charge of the Director of the Louvre Museum. From heads of departments down to the attendants the candidates are to receive a course of instruction to fit them for their posts. Here, we think, is certainly an excellent idea, one worthy of consideration. Our Museum authorities learn their duties only after long years of experience, but this very experience would constitute them excellent framers of a mode of education by which much saving of time might be effected, and a more thorough system adopted from the heads down to the underlings, who, educated in their special duties, would constitute a far more effective staff than when simply serving mechanically under superior direction. The duties of the modern museum official have assumed a far more defined and responsible character than is generally supposed.

We learn also that a commission has been appointed by the French Government to inquire into the hygienic condition of the various schools throughout the country, an inquiry which cannot fail to effect many excellent and sorely-needed reforms. One member of the commission is to report his personal experience of the inspection of the schools in other countries.

Another measure of hygienic precaution recently adopted in Paris is deserving of mention. The "Administration de l'Assistance publique" has built and set in circulation in the neighbourhood of the hospitals a number, as yet only very small, of cabs specially intended for the transport of the wounded, and of patients suffering from contagious diseases. These cabs, which can be warmed in winter, have, of course, been built with a view to being easily disinfected. In course of time each vestry-hall of Paris will be provided with one or more of these cabs.

PRACTICAL REMARKS  
ON THE SEASONING OF WOOD.

THERE have been promulgated from time to time so many different theories concerning the best way of seasoning wood, that, whilst taking the subject once more in hand, we feel that we are not only approaching debatable ground, but that we are stepping on to that which has been already well-nigh exhausted by writers.

Let us commence this paper by remarking that wood is an elastic material; that it expands under the influence of moisture; and that it contracts again when, by the process of drying known as "seasoning," the moisture has been evaporated from it. A thin coating of paint or other material, when applied to seasoned wood, may be the means of keeping out moisture, and, of course, if it be kept out, the wood will not be in any way affected by it; but if the moisture be permitted to approach dried wood the sponge-like character of the material will absorb it, and it will expand in proportion to the amount of moisture that has been absorbed.

We have remarked that a coating of paint or other similar material will, when applied to wood, exclude moisture, and we may further remark that, by the action of the evaporation of the natural juices of wood, it would appear a sort of fine skin is given to wood, which skin is sufficient, frequently of itself, to exclude moisture. We will furnish an example of this fact by detailing a case which came under our own observation. The flooring-boards of an old floor in a dwelling-house were taken up for the purpose of being re-planed. They had been laid down considerably over twenty years. Before being taken up the joints were seen to be quite close-fitting. After having been planed over the boards were relaid, and with the result that in about two months all the joints had considerably opened, and it was found to be necessary to again take up the boards and relay them, so as to secure close-fitting joints. It was the fact that by the removal of the old skin evaporation had recommenced, so the wood had undergone a second process of shrinking.

Wood requires time in which to season, very much in proportion to the density of its fibre. But this rule is not without an exception, for

pitch pine, which is not at all a densely-fibred wood, requires a long time in which to season even when the process is conducted under favourable conditions.

This occurs probably in consequence of the resinous character of pitch pine, the resin clogging the pores of the wood, and thus stopping up the channels through which the moisture would otherwise exude. There are some woods,—and mahogany, ebony, and some other of the tropical woods are of the number,—that, even in their living state, contain very little moisture.

Plants that are of slow growth contain less moisture when in a living state than do those whose growths are rapid. A mahogany tree requires 500 years in which to mature, and, as a consequence, its texture is exceedingly dense. Being dense in texture, it requires a long time to properly season, and during that lengthened period it shrinks very little. Mahogany should not be kept longer than necessary in the log, because inasmuch as the outside portion of a log contains the greatest amount of moisture, and it being the exposed part, it will, as the wood dries, shrink more than the inner wood, and so, to allow for the outside shrinking, outside shaves will and must occur.

The same remark applies with equal force to all log timber, but we name the circumstance in connexion with mahogany particularly for the reason that it is a general practice with some to keep mahogany logs in their unseasoned state, under the misapprehension that the logs do not deteriorate. When it is required to keep the logs in comparative bulk, it will be found to be a convenient method to have one cut put down the centre of them, which, as a rule, will be sufficient to obviate any tendency to outside shake that may arise in consequence of their shrinking on the outside. When cut, mahogany boards should always be laid aside to season in the same order as they have left the saw. Strips of accurately sawn wood should be placed at intervals of a not greater distance than 12 in. from each other, and we are inclined to advise that the strips of wood be placed even closer together than that.

It is advisable that some woods should be seasoned quickly, and that others should dry slowly. Mahogany must be seasoned slowly. To season it thoroughly and well, periods should be allowed in something like conformity with the following table. Care should also be taken that the strips of wood which separate each board should have their positions changed at least once in each year, and the whole of the boards should have their sides reversed once in each year, so that the sides of the boards which were below should, by being reversed, be placed upwards, and vice versa. The remarks made concerning the seasoning of mahogany boards may be taken to apply also to wainscot oak boards.

Table apportioning the Time to be allowed for Seasoning Mahogany and Wainscot Oak Boards under favourable Conditions.

Thickness of Boards.	Time to be allowed for seasoning in the open.
1 inch .....	12 months
" .....	"
" .....	18 "
" .....	24 "
1 1/2 .....	27 "
" .....	30 "
2 .....	33 "
" .....	36 "
3 .....	39 "
" .....	42 "
4 .....	48 "

It is, perhaps, superfluous to add that some kind of improvised roof must be provided under which to shelter the seasoning board from the damaging effects of the sun, the rain, and dirt. It is the practice with some to preserve the ends of mahogany boards, when they are undergoing the process of seasoning, by nailing a strip of wood on the end of each board. Of this practice we do not altogether approve, for the reason that it retards, to some extent, evaporation. A roof which sufficiently overhangs the ends of the boards is a complete preventive, and is, more advisable.

Newly-felled pine timber contains about 39 per cent. of moisture. The specific gravity of pine is (to water=1000) 0.9121. It can be air-dried to 0.5502, and artificially dried to 0.4200. The specific gravity of fir is 0.8700. It can be air-dried to 0.4700, and artificially dried to 0.3800.

Inasmuch as pine-deals reach this country in a narrow range of length, they can be placed in a position for drying which they would not well occupy if the range of lengths was longer. It is the practice with many joiners to "perch" their pine boards to season; but we are opposed



to the practice of placing the boards in any position where they become dirty, and impregnated with smoke, dirt, and grit. We hold that the object to be attained in the seasoning of wood is to slowly evaporate the moisture which is in the wood, without permitting the wood to lose its sawn shape, and at the same time to keep it perfectly clean.

It is here worth while penning a few notes relative to the importance attached to keeping wood clean, because the matter is one which is, now-a-days, receiving considerable attention. It is only of late that steamships have been largely employed to bring over foreign sawn timber. Shortly after the introduction of steamships into the wood-carrying trade, timber importers had the advantages which these vessels afford over sailing ships made clearly manifest to them by the preference which consumers of wood showed for the excellent condition in which the wood brought over in steamships reached them. The quick passages made by steamers afforded no time for any kind of fermentation of the sap to ensue, and there being no sea-washed deck-cargo to spoil the general appearance of a parcel, the preference for clean-looking stock began to direct the attention of consumers to the advantage of keeping seasoned wood also clean. There is no greater mistake made than to suppose, as some do, that the bulk of wood in a timber-merchant's yard necessarily improves with time. Timber importers learn to their cost that, instead of improving, it deteriorates very quickly indeed; and one of the questions which many timber importers have set themselves to consider is, whether it is not advisable for them to incur the cost of erecting large sheds under which they can store their better quality deals, and thus keep them clean.

Pine boards should be seasoned on very much the same plan as that which we have recommended for the seasoning of mahogany boards. We suggest only this alteration, that they should be placed where the wind can reach them, for they should be dried quietly. The reason for this is that pine is a wood which is prone to rapid decay, and therefore the quicker it can be placed in an absolutely dry position,—such, for instance, as being made up into internal joinery work,—the better.

Redwood is a difficult timber to season properly. The lack of uniformity in the lengths of redwood deals renders the adoption of the same plan as that which we have suggested for the seasoning of pine boards inconvenient, because inasmuch as the long boards would hang over the others the leverage would be certain to cause the boards to bend. Perhaps the best way is to place them on their edges in a frame although in this situation they would be likely to twist somewhat. The general practice is to "perch" them, but if they be at all "shelly," and "shelliness" is a fault usually attached to the finer kinds of redwood,—such as Archangel and Omega redwood, the rain is apt to penetrate into the "shelly" parts of the boards, and should frost succeed the rain it splits and rives open the boards terribly. It would thus appear to be imperative that redwood should be seasoned under cover. Wind is a useful agent to assist in the drying of redwood.

Baltic whitewood, of all classes, seasons quickly, and as the wood rapidly deteriorates under the action of the rain, the sun, and frost, the quicker it is dried the better.

Whitewood cannot be satisfactorily dried by artificial means, for it twists under the action of heat. Whitewood hardens very much by being exposed to the weather. The reason of this is that from its sponge-like texture the pores of the wood rapidly close when evaporation ensues.

We can recognise no advantage in incurring the expense of seasoning bearing woods. Of course, if the wood is positively wet, it must be dried of the superfluous moisture, but that may be considered to be sufficient. Flooring-boards are best seasoned by being "perched" on an elevated position, where the wind can freely circulate through them, and cause them to rapidly dry. The ends of the boards should be well lifted out of the damp earth. Perches of different heights should be erected, so that the long boards can be dried upon a high perch, and thus they are prevented from bending sufficiently as to cause them to dry in a twisted form. For the sake of preserving the face sides of the boards clean, it is a good plan to "perch" the boards in pairs by placing two boards with their face sides together. They will dry perfectly well when so placed, and no little advantage is

secured by having the boards turn out clean on the face side, for in a number of cases it will be found unnecessary to re-plane them when laid. We have commented in the commencing portion of this paper upon the danger of flooring-boards undergoing a second shrinking process on the removal of the dried faces of the boards.

It may here be remarked, and the comment is well worthy of the attention of architects, that the shrinking of flooring boards when laid is oftener to be accounted for by the fact that after the floor has been laid the boards have been replaned up so as to give a clean new-looking surface, than for the reason that the boards have been insufficiently dried.

The practice of drying the boards with their face sides together secures, as we have remarked, clean faces, and thus avoids the necessity of having the boards replaned after they have been laid, and as a consequence reduces their liability to shrink.

We have indulged in repetition on this point for the purpose of giving emphasis to our views, regarding them as being of some importance.

The system of stacking flooring-boards to dry in triangular fashion is much to be condemned for several sufficient reasons. The first is that, when so piled, boards will hold no inconsiderable quantity of snow or rain water.

The second is that they do not dry in those places where the boards must necessarily touch each other in the crossing.

The third reason is that when the boards are in long lengths they have a natural tendency to "swag" in their centres, and so to dry in a twisted or crooked form.

It is to be borne in mind that, although wood the grain of which is of a twisted character has a natural tendency to dry crooked, yet that it can, by being judiciously weighted, be kept straight.

This fact, however, suggests to us that even straight-grained wood will dry in a crooked form if, when left to season, it be allowed to assume a bent form, and that this being so it is imperative that the piling of wood into position for seasoning should be directed by care and intelligence.

H. S.

#### PROPOSED WORKHOUSE EXTENSION, ST. PANCRAS.

COMPETITIVE PLANS.

The drawings submitted in this competition, limited to five firms of architects, viz., Mr. H. H. Bridgman, Mr. Elijah Hoole, Messrs. John Saville & Son, Messrs. Wilson, Son, & Aldwinckle, and Messrs. Young & Hall, have been on view during the week in the Vestry-hall, Pancras-road. The requirement of the Guardians was the reconstruction or partial reconstruction of the present workhouse, with the view of providing accommodation therein for 2,000 inmates. Only six weeks have been allowed to the competitors for the preparation of the designs. The Board of Guardians and the Local Government Board have been for some time at issue as to the possibility of providing the required accommodation on the existing site. The Guardians contend that this can be done, but, as a concession to the view of the Local Government Board, they instructed the competitors to prepare alternative plans, one showing how the present site could be made to provide the required accommodation, and the other showing what could be done with the site of Cook's-Terrace thrown in. The present workhouse, which was commenced in the year 1809, should really only accommodate 1,400 inmates, but it at present, we are told, is so overcrowded that it contains 1,900. It is understood that the author whose design is selected will be chosen to carry out the work, the other competitors being paid an honorarium of 75*l.* each. In the event of the design placed first not being carried out from any cause, such as the disapproval of the Local Government Board, the Guardians reserve to themselves the right of discharging the architect on the payment to him of 300*l.* It seems that no professional referee is to be appointed to advise the Guardians in making the selection. If not too late, we would strongly urge the Guardians, for the sake of their constituents, the ratepayers of the parish (if not out of consideration for the competitors), to take independent professional advice before coming to a decision. The attainment of efficiency, combined with economy, should be the aim of the Guardians; but it is hardly to be expected that they can, unaided, pass an ac-

curate judgment as to the comparative merits of the designs in these respects.

We append a few notes as to the designs submitted, taking the competitors in alphabetical order. The motto system has in this competition been discarded, each competitor putting his name upon his drawings and the report accompanying them.

Mr. H. H. Bridgman.—Scheme A provides accommodation for 2,033 inmates, while scheme B shows additional area added to the site by taking in the ground upon which Cook's-terrace now stands, and provides for 1,937 inmates. Scheme A would, if carried out, necessitate the removal of the whole of the blocks abutting on the St. Pancras burying-ground. It also necessitates the removal of the main block of the present building, and of the relieving-wards and other buildings. The cost of this scheme the author estimates at 69,262*l.* The alternative scheme (B), by reason of the acquisition of the site of Cook's-terrace, involves the demolition of fewer of the existing buildings than would be necessary for the carrying out of scheme A. The cost of this alternative scheme (B) is estimated by the author at 54,475*l.* The design of the buildings under scheme A is "Free Classic" in character, while the buildings proposed to be erected under scheme B are proposed to be of Gothic character.

Mr. Hoole.—By Scheme A, Mr. Hoole provides accommodation on the existing site for 2,000 inmates, but demolishes fewer of the existing buildings than is contemplated by any of the other schemes. The new buildings are proposed to have floors and flat roofs, all of fireproof construction (rolled iron joists and concrete). The scheme also includes the erection of an additional story on the walls of the existing main building, by lifting the roof and interposing between it and the top of the present walls a framework of iron, filled in with double panels or slabs of concrete, having air-spaces between. This method of constructing the additional story is adopted for the sake of lightness. The extra story thus gained is to be used for dayrooms and workrooms. The cost of this scheme, including fencing, lighting, and draining, is put at 84,225*l.* Scheme B proposes to demolish only four small dilapidated blocks from among the existing buildings, the remaining blocks of the existing buildings being simply rearranged with regard to furniture and inmates. Two new blocks of considerable size are, however, to be provided on the Cook's-terrace site, accommodating about 800 inmates altogether. The cost of this alternative scheme, including paving, fencing, lighting, and draining, is estimated at 75,685*l.*

Messrs. John Saville & Son.—In scheme A these competitors retain the existing main block, kitchen and offices, dining-hall, lying-in wards, the infirmary, and a few other blocks. They also propose to raise an additional story on the existing main building. With regard to the Cook's-terrace site they believe that if it is used at all the whole of it should be used. They propose to erect on it (scheme B) three blocks four stories high, accommodating about 600 inmates. Floors of rolled iron joists and concrete are proposed to be used in the new buildings. The designs are of a domestic Gothic type. The authors estimate the cost of carrying out scheme A to be 90,000*l.*, the cost of executing scheme B being set down at 73,000*l.* Scheme A provides accommodation for 2,250 inmates, and scheme B for 2,050.

Messrs. Wilson, Son, & Aldwinckle, submit three designs, A1, A2, and B. The design marked A1 proposed to retain and improve the present main building, also the present dining-halls, kitchen, stores, &c. It also proposes the erection of a new laundry, general stores, workshops, and engine and boiler house in the rear of the present main building, and to extend the dining-halls eastward, and to build a chapel adjoining the latter. These, together with the existing halls and kitchen, constitute the new administrative block. On the north and south of this new administrative block, and to the east of the main building, will be erected six blocks or pavilions for inmates, all with their axes north and south. This scheme provides accommodation for 2,005 inmates, at an estimated cost of 66,000*l.* Scheme A2 differs mainly from A1 in that the old main building will be taken down, retaining all the other old buildings retained by the former scheme, with the addition of the lying-in and infants' wards building, which it is proposed to convert into a male infirmary, with wards for imbeciles on the ground floor. This scheme



provides accommodation for 2,016 inmates, at an estimated cost of 78,000*l*. Scheme B proposes to retain the present main building, the dining-halls, the kitchen department, the lying-in and infants' ward building, the old infirmary building, and the relief offices. The new buildings proposed to be erected on the present site under this scheme will comprise two pavilion blocks, one for able-bodied and one for sick and imbecile inmates; also new school houses, isolation and receiving wards, &c., similar to those provided in scheme A1. New buildings, four stories in height, to contain bedridden wards, will be erected along the whole length of Cook's terrace. This scheme provides accommodation for 2,049 inmates, at an estimated cost of 58,500*l*.

*Messrs. Young & Hall.*—Design A submitted by this firm proposes to give the required accommodation by clearing the existing site of all buildings except the kitchen and dining-hall block. With the exception of these buildings, this design consists of an entirely new arrangement of buildings, on the pavilion principle, with administrative block facing to King's-road. The cost of carrying out this design is estimated at 104,544*l*. The floors throughout are proposed to be of rolled iron joists and concrete. Design B submitted by these competitors retains the following existing buildings, viz., the main front block, the lying-in block, the infirmary, and the kitchen and dining-hall block. The authors propose to utilise the whole of Cook's terrace, building accommodation thereon, in one block, for 780 inmates. The new buildings on the existing site under this scheme are arranged, as far as possible, on the pavilion principle. The total cost of this alternative design is estimated by the authors at 86,962*l*. The buildings are plain and unpretending in style, but the planning appears to have been very carefully studied.

Since the foregoing was in type we learn that at an adjourned extraordinary meeting of the Guardians, held on Thursday morning, a letter was read from Mr. Bridgman, one of the competitors, suggesting that an architect of reputation should be called in by the Guardians to report upon the several schemes before any decision was come to. A letter was also received from Mr. E. J. Phisick, sculptor, of Marylebone-road, forwarding his reasons in favour of the selection of the plans sent in by Messrs. Saville & Sons.

On the motion of Mr. Bolton, by one of the Guardians, it was resolved, by 7 votes to 6:—

"That, having regard to the sufficiency of the present site for efficient workhouse accommodation, clearly demonstrated by the reports and plans of all the competing architects; and having regard to the fact that it will be by far the least expensive course to provide workhouse accommodation on the present site alone, the design and plan to be selected shall be one of those providing for workhouse accommodation on the present site."

A deputation from the Vestry of St. Pancras attended to present a resolution adopted by a committee of the Vestry, expressing the opinion that the most efficient and economical schemes submitted by the competitors for the reconstruction of the workhouse were, in every case, the schemes marked "A."

It was moved by Mr. Drew, and seconded:—

"That the further consideration of the subject be referred to the Workhouse Accommodation Committee, with authority to consult an architect as to the merits of the different plans relating to Scheme A, whether the instructions of the Board and the requirements of the Local Government Board have been complied with; whether the necessary workhouse accommodation can, as it appears by the plans, be provided on the present site of the workhouse; and whether the same can be provided at the price estimated."

This motion was lost, 5 voting for it and 6 against.

It having been resolved that the Board should at once proceed to select a design and adopt an architect, the Board adjourned to the Vestry-hall to examine the designs. On their return, it was resolved, on the motion of Mr. Skoines:—"That the five architects be reduced to two." A show of hands was then taken for each of the competitors, and the result was as follows:—

Bridgman .....	3 votes.
Houle .....	2 "
Saville & Son .....	6 "
Wilson, Son, & Aldwinckle ..	8 "
Young & Hall .....	1 "

It was then resolved, on the motion of Mr. Skoines:—"That the names of Messrs. Wilson, Son, & Aldwinckle, and Messrs. Saville & Son, having the highest number of votes, be again put to a show of hands." This was accordingly done, and the result was:—

Wilson, Son, & Aldwinckle ...	7 votes.
Saville & Son .....	4 "

It was finally resolved:—"That the Scheme A No. 1 of Messrs. Wilson, Son, & Aldwinckle be accepted and sent to the Local Government Board for approval, and that the architects be requested to put themselves into communication with the Local Government Board."

#### THE INTERNAL DECORATIONS OF THE ROYAL AVENUE THEATRE.

The Royal Avenue Theatre must have been noticed by most of our readers. It is situated at the end of Northumberland-avenue, and has an odd aspect from being plastered against the end of the railway bridge in swallow-nest fashion. The architect is Mr. F. Fowler, of the Metropolitan Board of Works (Fowler & Hill), and the building has been erected by Messrs. Kirk & Randall for a gentleman whose mission appears to be to build theatres and sell them,—Mr. Sefton Parry.

Within, the accommodation is more considerable than would be supposed outside. It will seat 1,200 persons, we are told. To what extent the performances will be interfered with by the passing trains we cannot yet say. The dressing-rooms, we are sorry to hear, are under the auditorium, a deep basement having been formed.

Our present purpose is with the internal decorations, which have been executed by Mr. Boekbinder and some other foreigners, and are certainly more artistic than most of the theatrical work we have seen lately. The embellishments in *relievo* are wholly of *carton pierre*, that is to say, the background is so well as the raised ornamentation thereon, no plaster being used. The ceiling of the auditorium, which is circular, is divided into compartments, radiating from the central chandelier by figures with expanded wings, holding in one hand a palm branch which passes through a wreath of laurels in the other hand, crowning a portrait of a dramatic author, of which there are twelve, namely, Shakespeare, Beaumarchais, Van Vondel, Congreve, Calderon, Corneille, Goethe, Racine, Goldsmith, Schiller, Sheridan, and Molière. These portraits are artistically executed by Mr. Henri Verbeecken, of Antwerp. Beneath the ceiling is a cove, on which are highly enriched panels, adorned with paintings in *camdeu* of *mascarons* of the Nine Muses and Apollo. The cove forms at its extremities two spirals, well modelled with trophies of musical instruments. The proscenium itself has a ceiling of seven panels taking the shape of an arch, crowning the elevation of the stage-boxes, the topmost of which on each side is surmounted by a *fronton*, on which are nested figures of children holding a medallion between them. On each side of these boxes are two well-modelled Caryatides, holding vases from which spring lights supported by four consoles of Tragedy, Comedy, Drama, and Baroque. The two figures over the centre of the stage symbolise Music and Song, and support the royal arms. The ornamentation of the boxes, balcony, and amphitheatre is artistic, and does credit to Mr. Boekbinder. The prevailing tone is ivory and gold.

#### ART AT NEWTON ABBOT.

IN connexion with the Newton Abbot School of Science and Art, an Art Exhibition will be opened in the Alexandra Hall on Wednesday, April 12. Mr. Norman Shaw, R.A., and Mr. J. C. Horsley, R.A., are the judges. A special feature of the Exhibition will be tile decoration in *sgraffito*. This style of pottery ornamentation has been in vogue in Devonshire for some hundreds of years. It has recently been re-associated on general pottery in North Devon, and now by the Newton Art School on tiles; its effects for strings and panels will be seen at the Exhibition. This style of work appears to be susceptible of wide adaptation.

There are numerous prizes for painting on tiles, and several chased silver badges are offered, chiefly for amateur work. Amongst the donors of these special prizes are the Duke of Somerset (Lord-Lieutenant of Devonshire), and the Earl of Devon.

Mr. Horsley will deliver an address to art students on the occasion of the opening of the Exhibition.

A similar Exhibition, held in the town last year, appears to have been very successful.

#### THE RATHHAUS AT AIX-LA-CHAPELLE. BULB-SHAPED SPIRES.

The Rathaus at Aix-la-Chapelle is a building of various dates, which is said to occupy the site of the ancient palace of the German Emperors. The main body of the edifice is oblong in form; the side fronting the market-place forms a façade two stories high, pierced with large square-mullioned windows, the spaces between which are adorned with panelling and canopied niches. The date given to this part of the building is 1353, but it certainly looks considerably later. Attached to either end of the Rathaus are dissimilar towers of very rough rude masonry, and evidently of considerable antiquity; their lower portions are, without doubt, Romanesque work, and they certainly formed a portion of the old castle of the German Emperors. How these towers were originally terminated it is now impossible to say; at present they support two of the most singular examples of the "bulb-shaped spire" to be seen in Germany. However much architects may find fault with these curious structures, they are remarkably picturesque, and the charming contrast of colour offered by the grey slates covering the upright portions of these steeples and the green of the copper with which the bulbs are coated, makes them very attractive objects to the painter. As will be seen from our engraving, although at first sight the two spires seem to be of the same design, yet they are found to be totally different when more carefully examined.

No satisfactory explanation seems yet to have been given of the origin of these bulb-shaped spires or steeples. Nor is it quite clear whether they first appeared in Holland or in Germany. They seem to have found more favour in the north than in the south of Europe, for while they are seen in abundance in Holland, Belgium, Germany, the north of France, and examples are not infrequent in Norway, Sweden, and Denmark, yet they are not common in Italy, Spain, Portugal, or the south of France. It is said that the spire of the lantern at Antwerp Cathedral is the earliest existing construction of this kind. Whether there is any authority for this statement we know not. It has been also suggested that the Dutch invented this kind of steeple during their great tulip rage and that the bulb of the tulip suggested the form of these spires. This certainly seems improbable.

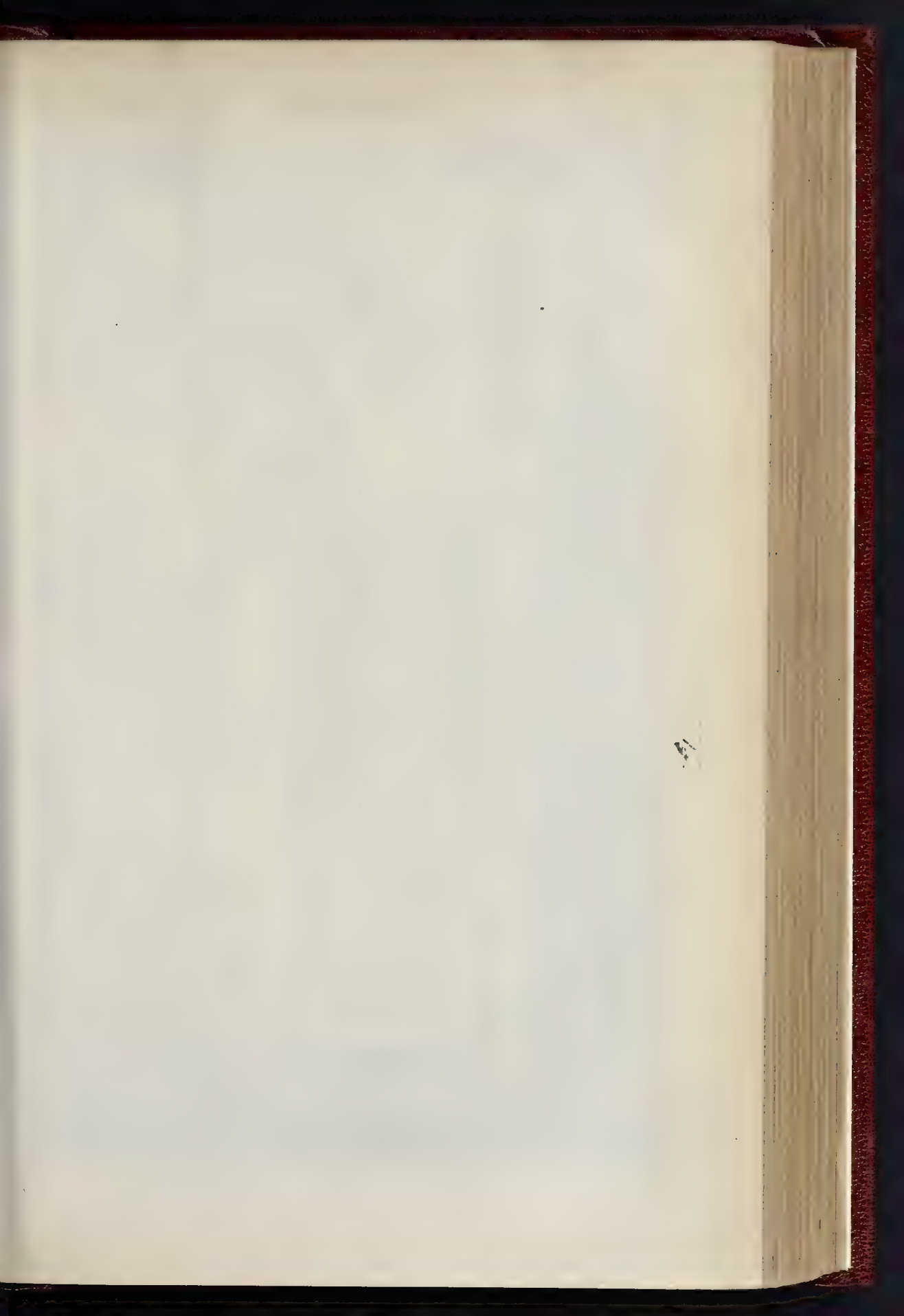
If this form of spire were common in Portugal we should at once have said that its origin was undoubtedly Indian, and that its form was copied from the Indian temples; but it does not appear to have found favour in the eyes of the Portuguese.

Another theory is that it invaded Europe from the East by way of Russia, Hungary, Bohemia, &c. This is possible, but as far as we know, the examples of this form of spire to be found in Hungary, Bohemia, &c., are all very late; we doubt whether any of them are anterior to the year 1600. Nor are they so developed or anything like so picturesque as the Dutch examples.

An inclination towards the bulb form may be noticed in the lanterns over the domes of St. Mark's, Venice, and perhaps this may suggest another origin for the bulb-shaped spire. Although the metal coverings to the dome of St. Mark's date only from about the fifteenth century, in all probability they were reproductions of the old Byzantine works, and it is therefore possible that the bulb-shaped spire may be a kind of Byzantine revival at the close of the Middle Ages. We have frequently alluded to the curious attempt which appears to have been made in Germany to revive the *Romanesque* at the close of the fifteenth and in the sixteenth century, and this may have been the result of an attempt to revive the Byzantine. The bulb-shaped spire never seems to have been popular in England, and but few examples are to be seen in this country.

**Value of a Town-hall.**—It is authoritatively stated that the Kensington Vestry have received for the current year, with some weeks unexpired, the sum of 1,800*l*. for the letting of the hall and rooms.

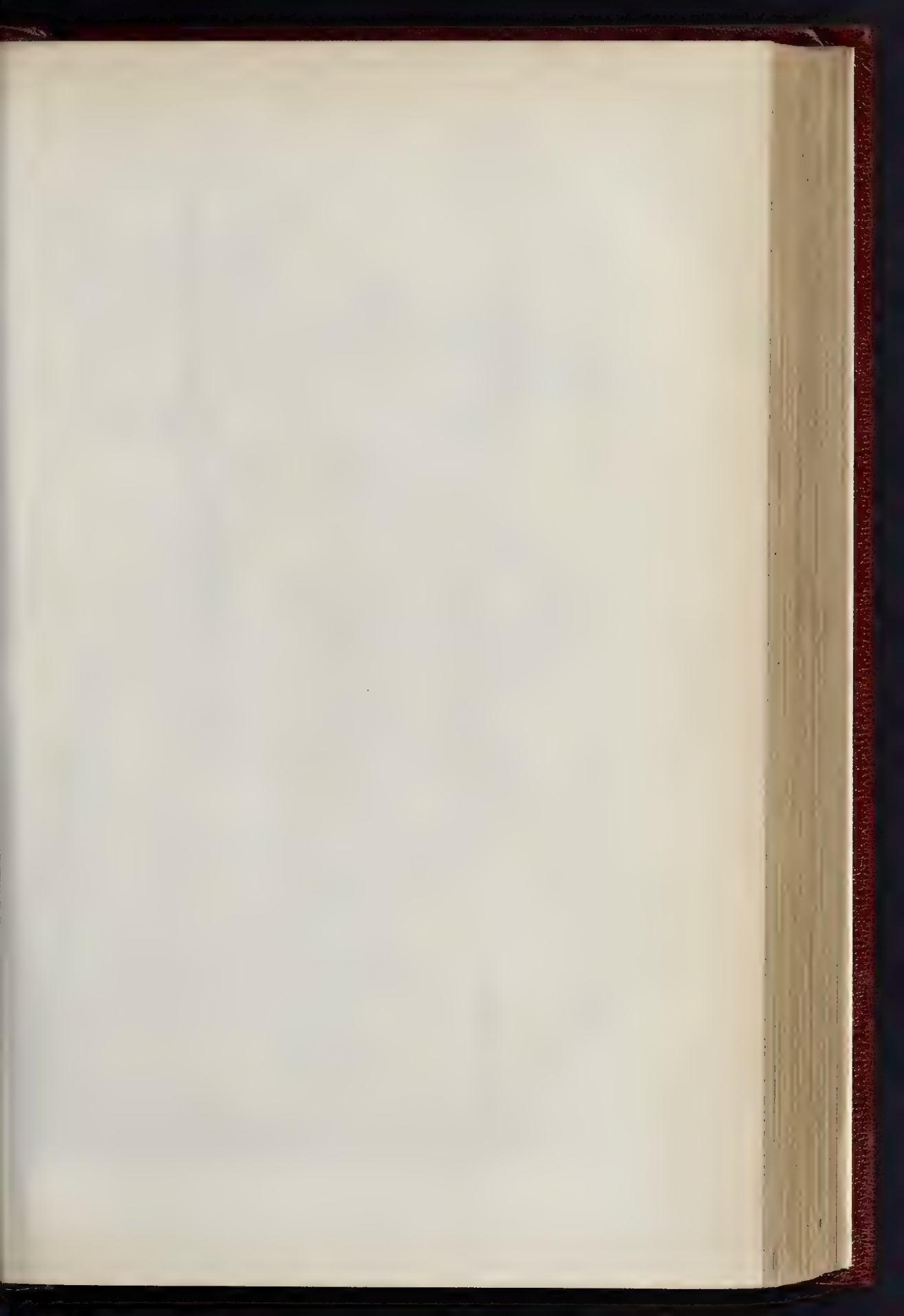




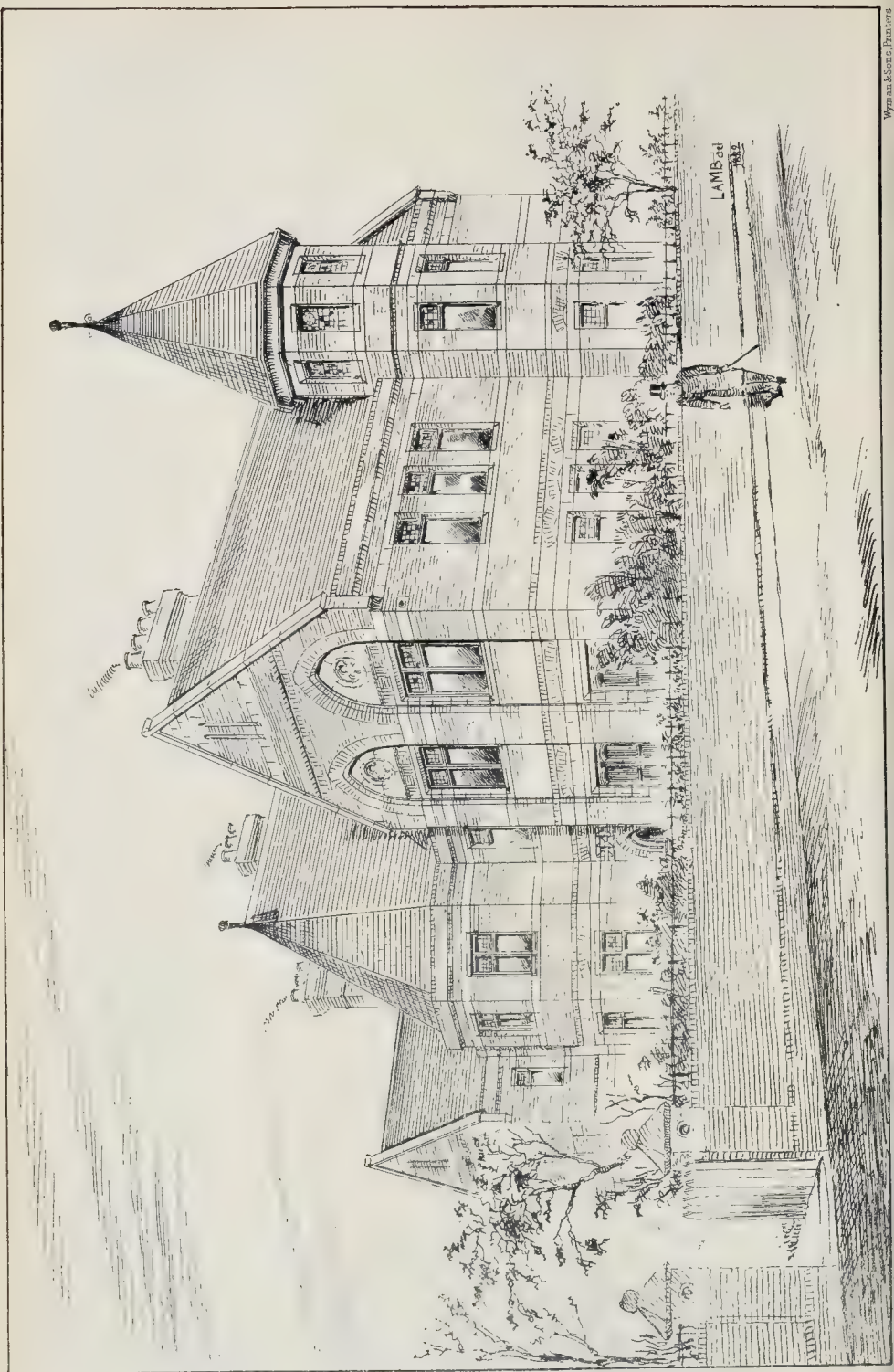


THE RATHHAUS AT AIX-LA-CHAPELLE: BULB-SHAPED SPIRES.

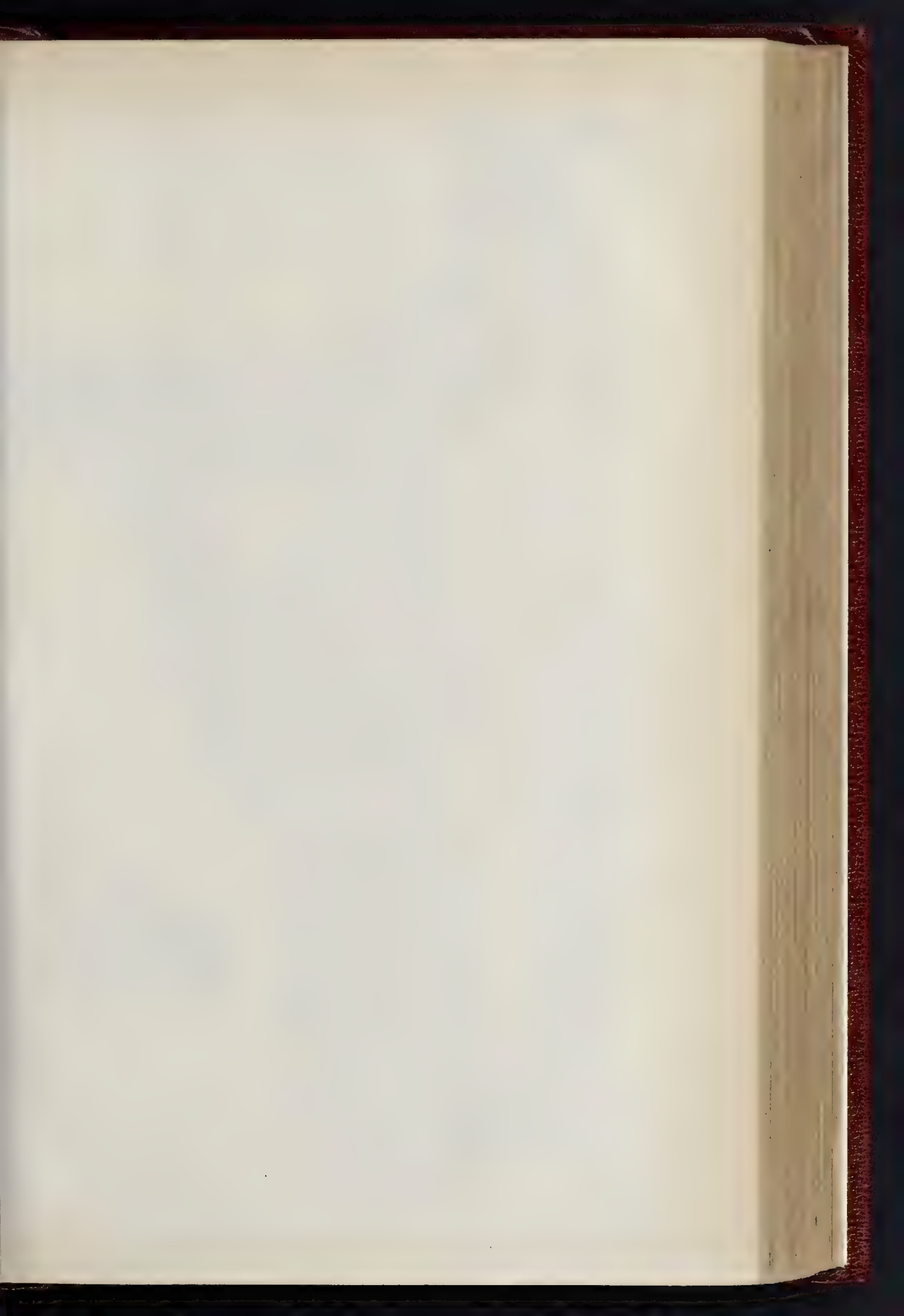




THE BUILDER. MARCH 11, 1882.







THE BUILDER, MARCH 11, 1892.







Whiteman & Bass Photo. Co., 236 High Hillborn

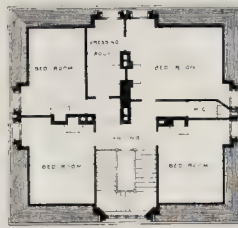
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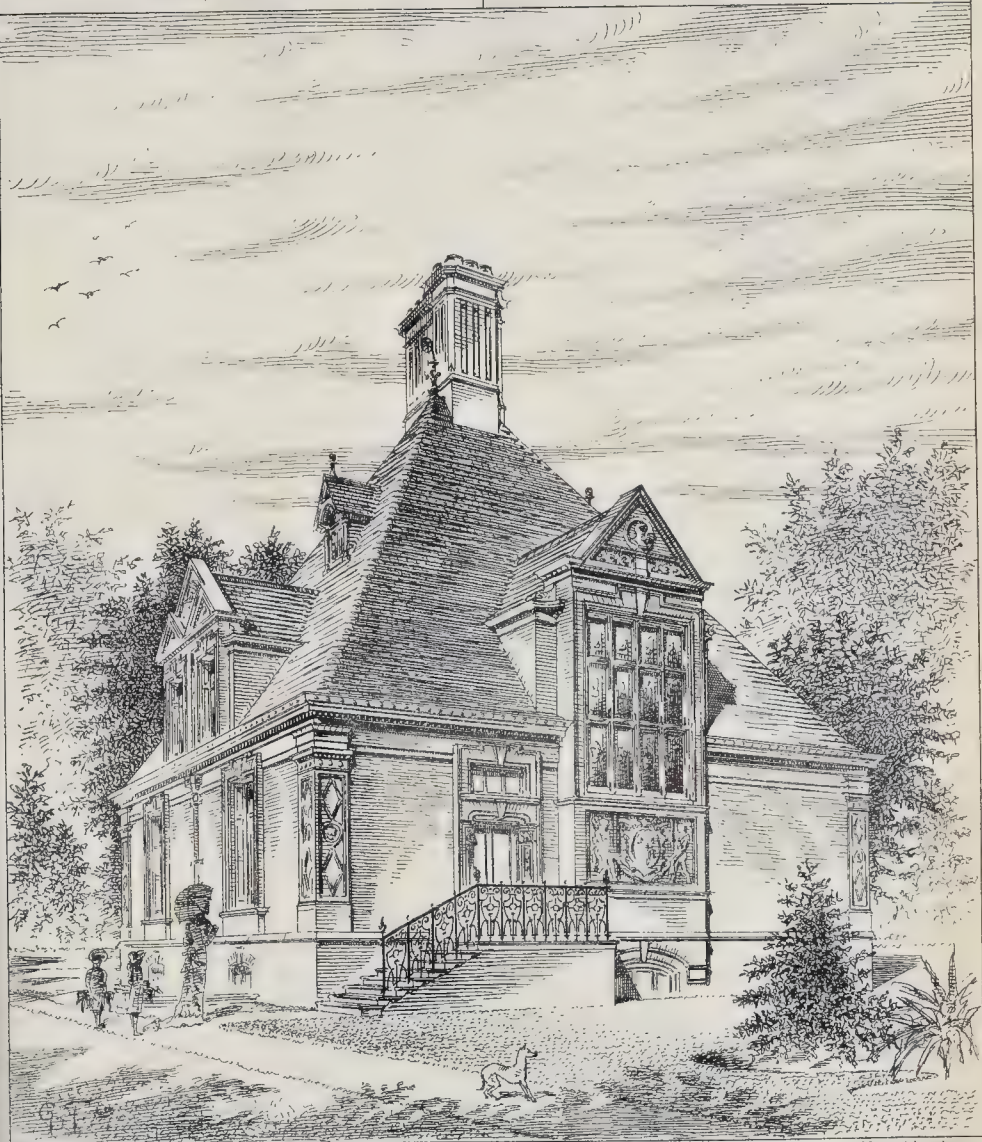




GROUND PLAN.



BED ROOM PLAN.



H. G. W. & Sons Photographs

Wymann & Sons Ltd. 75

A HUNTING LODGE IN THE ARDENNES, FOR THE DUCHESS OF OSSUNA.—MR. EDWARD J. TARVER, ARCHITECT.





## A PRIVATE SCHOOL NEAR LANCASTER.

This school is proposed to be built on a vacant plot of land a short distance from the town, for the Rev. Wm. Barton. Accommodation is provided for 120 boys. There is a large dining hall at the back, which will be used as a lecture-room when required. The architect is Mr. Jas. A. Burton.

## PROPOSED ROMAN CATHOLIC CHURCH, MOTHERWELL.

ONE of our illustrations this week is the proposed Catholic Church of Our Lady of Good Aid, Motherwell, for the Very Rev. James Glancey, D.D., which will probably be commenced soon. It is in the (R. C.) archdiocese of Glasgow. The church has been designed by Messrs. Pugin & Pugin, of Westminster.

## A HUNTING-BOX, ARDENNES.

THIS hunting-box has been built for the Duchess of Ossuna, from a complete set of working drawings and full-sized details, prepared and sent out by Mr. Edward J. Tarver, architect. It is appropriately situated in the historical Forest of Ardenness.

For who visit the spot are likely to feel with Touchstone, who, first exclaiming,—"Now am I in Arden"; adds,—"The more fool I; when I was at home I was in a better place."

## IDEAL DWELLING-HOUSES.

ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on Friday, the 3rd inst., Mr. Aston Webb, president, in the chair,

Mr. E. Ingress Bell read the following paper:—

In considering how I could best respond to your invitation to furnish a paper for discussion this evening, it occurred to me that it might be not altogether unprofitable or inopportune if I were to bring to your recollection some pictures of domestic architecture, drawn for us by contemporary masters in the higher walks of imaginative literature, and that the "ideal dwellings" which these pages supply would,—when viewed in the light in which I shall endeavour to present them to you,—repay a little attentive examination. For, although you may not at first feel disposed to attach much importance to the individual opinions and preferences of the writers alluded to when they treat of architecture, there are, nevertheless, certain circumstances connected with their treatment of the subject which are, I submit, worthy of our careful consideration.

We must bear in mind, first of all, that they are themselves artists, and that all art is one in principle, however various may be the media of artistic expression. Their minds are, therefore, presumably, open to a recognition and appreciation of true art wherever they may meet with it. The art they exercise is, moreover, closely allied to our own, inasmuch as it is a creative one. By means of a multitude of minute touches, which may be not unreasonably likened to the materials which the builder employs, they construct a complete, effective, artistic, and consistent whole. They must, while giving the utmost finish to their works, resist, as we are called upon to resist, all temptation to such an over-elaboration of details as would detract from the general unity and impressiveness of the design. The MSS. at South Kensington show us the care which was bestowed on the finish of their works by authors whose flowing style reads with the glosses of perfect spontaneity,—how sentences, phrases, words even, were written and re-written, times out of number, until the exact shade of expression was caught. And we know, from other sources, that to the last moment the general structure of the story, the due relation of the several characters, their proportion, and relative prominence, were subjects of the most anxious and even painful thought.

There is more than a merely etymological affinity between their "plot" and our "plan." Both demand the same inventive faculty,—the same fertility of resources, the same unwearied nicety of adjustment; and the ordering of telling masses, the grouping, light and shade,—the supremacy and subordination of the parts, the antitheses, contrasts, and little verbal artifices,

and even the dramatic incidents and situations (all disposed with a view to the general effect), find a close if unsuspected analogue in our own really successful work. As artists, their minds are, as I have said, specially receptive; their instinct rarely betrays them into admiration of what is worthless; and although they are not, of course, alive to purely technical excellencies or defects, they are, from habit and experience, predisposed to appreciate the higher qualities of architectural art, and, in their descriptions of it, they generally seize upon its broader effects. Their calling, moreover, demands an insight into human character; and we, who live, I fear, too much in a narrow world of our own, and regard our art too exclusively from one particular point of view, may learn much from writers who stand, in some measure, as interpreters of the public sentiment and indexes to the public sympathies.

For, it is of the very first necessity that the writers in question should place themselves completely *en rapport* with their audiences. They do not address us from the vantage-ground of an official platform. Unlike the preacher and the moralist, whose unpleasant duty it is to admonish or rebuke, their function is primarily to entertain; and their art finds its only opportunity in the interest they are able to awaken. Unless, therefore, they are in harmony with the views and feelings of the classes to whom their works are addressed, those works will remain unread. Their success is in proportion to the community of sentiment between them and that world to which they appeal. And the remarkable, and indeed, unbounded, success achieved by writers to whose works I shall presently more specifically refer is an evidence of the skill and certainty with which they have touched some of the common instincts of humanity.

When such a body of writers, distinguished by keenness of observation, and a close acquaintance with human character and motives, are found to be in accord on any particular subject, we may be pretty sure that the world is on their side; and when the subject of their agreement is the art in which we are all more particularly interested, their utterances assume for us a value which we must not under-estimate.

My present business is to suggest that, on the subject of domestic architecture, there is a very remarkable general agreement amongst them, and to submit that the particular variety of the art which enlists their common sympathy has, for the reasons above adverted to, a special and peculiar claim upon our attention. I propose, then, to place before you some short extracts from the works of a select few of the writers alluded to,—selected, not because they happen to make for any preconceived view of my own, but because they are representative men of their class, and, beyond all controversy, the most eminent in their own peculiar domain. And I would invite each one of you to test my theory from your own wider range of reading, and so, either to confirm or confute it.

The first place is due to the poets (although they will not, for obvious reasons, have, for us, the same value as their literary brethren), and your thoughts will instantly turn to the Lanreates' elaborate picture of an ideal palace, "a lordly pleasure-house,"—a mansion "royal—rich and wide." He gives us at the outset a sort of block-plan of the structure. There are four courts, each with a central fountain and enclosing cloisters. There are "long-resounding corridors," great rooms and small, "all various, each a perfect whole," and so on. Becoming impatient of these prosaic details, he breaks forth into a rapturous eulogy of the ornamental portions of the structure,—the gilded balconies crowned by censuring angels, the wall-paintings, the traceries of costly stones, the perfumed incense, and all that wealth of seductive imagery with which the poem abounds. The bias of his mind is distinctly seen, and we could almost draw in detail the splendours he dilates upon with so much emotion. In very weariness at this unrelieved beauty, he turns at length for repose to a "outage in a vale"; but his final aspiration is still towards those palace towers, "so lightly, beautifully built," and to the graceful forms and lovely colours which are with him an over-mastering passion. We can easily epitomise this supreme effort to give expression to the poet's ideal pleasure-house. Lofty towers, a various skyline, bristling with gilded statuary; freescos, mosaics, gold,—a more than Oriental blaze of colour to enchant the eye,—and, faintly audible throughout, the plash of perfumed fountains, to lull the sated sense. This is, of course, a "castle in the air." It is the *soul* which is to

sit apart in contemplation of all this sumptuous array of treasure, or pace, in passive isolation, the shadowy cloisters of its silent courts. But the picture is valuable as showing us the direction in which this perfect artist sought an image of the utmost conceivable architectural magnificence.

From one of the most beautiful of modern poems, the "Earthly Paradise," I could cull countless passages repeating the same feeling, and in which the poet, dealing even with Grecian myths, gives the architectural accessories an ideal character differing but little from the above.

But to leave these aerial flights, and descend to a firmer footing, let us turn to the "ideals" of some of our most renowned writers of fiction. To begin with the greatest of them all, you will remember well, in that immortal work, "Esmond," the description which its author, with the feeling of a true artist, gives of the ancient home of the Castlewoods:—

"It stood on a rising green hill, with woods behind it, in which were rooks' nests, where the birds at morning, and in returning home at evening, made a great cawing. At the foot of the hill was a river, with a steep ancient bridge crossing it, and beyond that a large pleasant green flat."

The Hall of Castlewood was built with two courts, whereof one only,—the fountain court,—was now inhabited, the other having been battered down in the Cromwellian wars. Still in good repair was the great hall, near to the kitchen and buttries, a dozen living-rooms looking to the north, and communicating with the little chapel that faced eastwards, and the buildings stretching from that to the main gate, and with the hall, which looked to the west into the court now dismantled.

The Restoration did not bring enough money to the Lord Castlewood to restore this ruined part of the house, where were the morning parlours; above them the long music gallery, and before which stretched the garden terrace, where, however, the flowers grew again which the boots of the Roundheads had trodden in their assault."

In the "Virginians" there is a further reference to the old Hall, "grey with many gables and buttresses, and backed by a darkling wood."

This faithful loving portrait of so many an old English home,—so tender and so true, so broad and painter-like in its sweep,—brings the whole scene instantly before us. We seem to stand beneath the lichen-covered walls, and to listen to the drowsy clamour of the rooks.

If it should be urged that this is a picture of a *real* house, and not of an ideal one,—that its features are such as belonged to houses of its class at the date at which the story is laid, that they were prescribed by historical necessity, and, as such, unavoidably adopted by the author, I would suggest that the treatment of the subject shows clearly enough where the painter's heart was. For, let us set against the tenderness with which he portrays for us this dear old Castlewood Hall, the almost savage scorn with which he outlines, with equal precision, the country seat of my Lord Carabas:—

"At the entrance of the Park there are a pair of great, gaunt, milked, lodges,—mouldy Doric temples,—with black chimney-tops, in the finest Classic taste."

He gave the porter a shilling (the first he had seen for some time) and proceeded.

"The gates were passed; a damp, green stretch of park spread right and left, immeasurably; confined by a chilly grey wall."

In the midst of the park is a great tank, or 'lake.' A shabby temple rises on either side, and is approached by a rotten barge, that lies at root in a dilapidated boat-house.

The house was an enormous mansion, square, vast, and dingy. It was flanked by four stone towers with weather-cocks. Rows of black windows, framed in stone, stretch on either side right and left. Three stories, and eighteen windows of a row! In the midst of the grand facade is a large Ionic portico, approached by a vast, lonely, ghastly staircase.

But these stairs the great people do not ascend. Lady Carabas would be wet to the skin before she got half way up to the carved Ionic portico, where the four dreary statues of Peace, Plenty, Piety, and Patriotism are the only sentinels. You enter these palaces by back doors.

Up the long avenue I walked in solitude. At the seventy-ninth tree on the left-hand side the insolvent butcher hanged himself. I scarcely wondered at the dismal deed, so woful and sad were the impressions of the place. For a mile and a half I walked, alone, and thinking of death."

You will here note the lavish employment of adjectives to heighten the effect—"gaunt," "mouldy," "ghastly." They are piled one upon another in a manner which, in less practised hands, would have defeated their author's aim.



If you think this redundant use of them unfair, I beg you to remember that such a view would make for my contention, by showing the strong animus of the writer when dealing with one particular variety of architectural style, a temper of which his works supply numerous examples.

If, in the case of Castlewood, the circumstances connected with the story may have dictated the kind of structure to be sketched, no similar necessity was placed upon the author in this latter instance. Here, in the unfettered use of his discretion, he has chosen to associate all that is sordid and worldly, all that is at once pompous and mean, with architecture of a type with which we are all familiar. Words could not convey to the mind a more depressing scene than the one presented to us with elaborate sarcasm. There is something almost ferocious in the irony with which he names the four statues adorning the useless and unused portico of this poor bankrupt noble, in whose forelorn mansion there may still, let us hope, be a place for patriotism, scarcely for piety, and assuredly not for either peace or plenty. The darkest touch of all is the suggestion that the suicide of the insolvent tradesman was due to the delinquencies of the noble marquis. Now, you will not, I hope, suppose that I go so far as to suggest that bankruptcy and suicide are concomitants of Palladian architecture. Kindly keep in view my main position, viz., that in the minds of these most observant and popular of all writers, empty display and cold discomfort are almost always associated with one type of dwelling, and that the hospitalities, the amenities, and the joyfulness of life are as invariably associated with another type.

The "ideal dwelling-house" of the novelist is, in short, an eminently picturesque one: upon some of its special characteristics I shall touch presently. It is generally drawn from Tador or Stuart originals,—and the worst that can be laid to its charge is a reputation for the possession of some harmless ghost which only adds piquancy to the general interest.

By way of further illustration, let us pass to the works of a writer of scarcely less originality and power than the author of "Esmond," the authoress of "Adam Bede," than whom no writer of modern fiction has shown a more lively sense of the distinctive charms of English landscape, or the possession of a truer appreciation of our native architecture. The following is, perhaps, one of the most perfect architectural miniatures ever drawn, having all the truth, grace, and sweet suggestiveness of a picture by Frederick Walker:—

"Mr. Garth's house was a little way out of the town,—a homely place, with an orchard in front of it; a rambling, old-fashioned, half-timbered building,—which, before the town had spread, had been a farmhouse, the attic still smelling deliciously of apples and quinces."

We can easily supply the missing features,—the boldly-jutting fire-side nooks, the varied and fantastic grouping of the chimneys, the hospitable porch, the mullioned windows. We see clearly the type of house which claimed her admiration. It is said that in the house above described the authoress passed her girlhood. However that might be, her object certainly was to present us with a picture of an attractive middle-class English home. If she took a real house for her model, it was because in that she found her "ideal." If there were any room to doubt her preference in this matter,—a preference which all her works make quite clear,—the following pregnant passage from her pen would set the matter at rest. "We get fonder," she says, "of our houses if they have a physiognomy of their own as our friends have." Thus the varied and artistic treatment of domestic architecture, such as that which differentiates the Medieval, Tudor, and Stuart styles, was that which evidently commended itself to her sensitive and refined nature.

And similar instances, in any required abundance, might be given from writers of the first rank, including even Carlyle. In order to obtain a sufficiently wide base for my argument, I have, although not a novel reader, dipped into all the modern higher-class novels at hand, and I find that on this subject the writers are "all in a tale." I will not quote from them in detail; but if I am not wearying you with these pen pictures I should like to read you one more extract. I have saved the most delicate morsel for the last; and although you have all met with it, and many of you may remember it well, you will, I dare say, excuse my closing

the series with a picture by the master-hand of Dickens. It is a really delicious piece of most appreciative and artistic description; in which we get a glimpse of the interior, as well as of the exterior, of his "ideal dwelling-house,"—an ideal which recurs with but little variation throughout all his works. "It was one of those delightfully irregular houses";—and here one may pause to observe that this is the characteristic which is always appreciated by the artist, whether his medium of expression be the pencil or the pen:—

"It was one of those delightfully irregular houses, where you go up and down steps out of one room into another, and where you come upon more rooms when you think you have seen all there are; and where there is a bountiful provision of little halls and passages; and where you find still older cottage rooms in unexpected places, with lattice windows and green growth pressing through them."

Mine was of this kind, and had more corners than I ever counted afterwards; and a chimney (there was a wood fire on the hearth) paved all round with pure white tiles, in every one of which a bright miniature of the fire was blazing.

Out of this room you passed into a little gallery with which the other best rooms communicated, and so, by a little staircase of shallow steps, with quite a number of corner stairs in it considering its length, down into the hall.

From this you came on to a room which was part library, part sitting-room, part bedroom, and seemed, indeed, a comfortable compound of many rooms.

Out of this you went straight, with a little interval of passage, into a plain room, with a small room adjoining; or you might, if you came out of another door (every room had at least two doors) go straight down to the hall again by half a dozen steps and a low archway, wondering how you got back there.

Such, with its illuminated windows, softened here and there by shadows of curtains, shining out upon the starlight night; with its light, and warmth, and comfort; with its hospitable jingle (at a distance) of preparations for dinner; and just enough wind to sound a low accompaniment to everything we heard, were our first impressions of the house."

And then follows a similar description of the quaint old furniture which adorned and completed the dwelling,—a description which is too long for me to read to you.

Now was there ever drawn so delightful a picture of a delightful house? "Delight-fall" is surely the only word that will properly describe it. It combines all the best points of those houses previously adverted to, with others not found in them at all: Tennyson's "great rooms and small,—all various,—each a perfect whole"; the halls and galleries of Castlewood; the cosiness of Mr. Garth's homely cottage. It is crammed full of suggestions and studies for a painter, and over all comfort reigns supreme. The planning is not the cold, formal arrangement of a suite of public offices, or the like,—proper enough in its place; it is just that charmingly artful, though apparently haphazard, disposition, whose end is perfect convenience, providing alike for the freest social intercourse and the completest personal retirement, and compared with which the balance, compactness, precision,—I had almost said the priggishness,—of Classical plan is as prose is to poetry, or as water is to wine.

If you will call to mind the works of those contemporary architects who have distanced all competitors in their success with domestic work, you will find that they faithfully reflect the peculiarities of the buildings sketched for us above,—the side-lighted long and wide galleries, the quaint little halls and nooks, the many-cornered rooms, the broad, low, many-lighted windows with seats beneath their sills,—in short, all the little adaptations, expedients, and surprises in plan, arrangement, and general design, upon which so much of our interest in the old work turns. So closely do these successful modern works resemble those whose descriptions I have read to you, that it would be impossible not to believe that the architect had followed the novelist, did we not know that both were alike indebted to those charming originals which are still left to us in happy abundance throughout the length and breadth of the land, and which seem to be (as indeed they are) a part of the progressive growth and life of the nation. In this they possess a marked advantage over those imported examples of the Italian Renaissance, which, however excellent they may be in the abstract, appear to be (so to speak) beyond the nation's power of assimilation.

To take an instance. Few buildings have been so fortunate in securing the unanimous

approbation of the critics as the fragment of Inigo Jones's palace at Whitehall. Its proportions, detail, and *ensemble* have each and all received unstinted praise. It is, moreover, connected with, perhaps, the most tragic incident in our annals. The window through which a king walked to meet an ignominious death at the hands of his subjects still looks down upon the broad and populous street. For years I have occupied a room facing that building, and I think I may say that, with the exception of some foreign or American tourist, I never yet saw a human being pause before it, notwithstanding this double claim upon his attention. The foreign manner in which it is designed not only fails to arouse any interest in the beholder, but it would almost seem to possess the sinister property of effacing all remembrance of the tremendous scene to which the building was a witness. The continuity of historical sequence is broken by it, and it is incredible that so un-English-looking a structure can really form an integral portion of English history. Allied with much that is unapproachably excellent in our native architecture of the sixteenth and seventeenth centuries, there are, no doubt, many defects from which this example is free; defects of style, of taste, of execution, of construction perhaps. From the circumstances of the time this could not well be otherwise.

I am not now concerned to defend our English Renaissance architecture, or its modern counterpart, from the charges brought against it by the purist and the doctrinaire. If I were I might appeal from the art of Shakespeare's time to that of Shakespeare himself. No one treated all merely pedantic rules and prescriptive limitations with a more audacious freedom. His anachronisms, anomalies, and inconsistencies (about which he was quite careless), can be pointed to by every critical nuskull. But his works will, nevertheless, remain a power and a delight till time shall be no more, whilst the classical drama of succeeding century, with its punctilious regard for the "unities," and all its mechanical perfection of mere form, is already a dead thing.

The truth is, there are qualities about our old English houses akin to those inspiring our old English ballads, which, with unthought diction and (may be) halting metre, still and their way straight to the heart, move swiftly and more surely than if clothed with the classic purity of Milton, or the perfect literary finish of Pope.

I shall not trespass much further upon your patience. You will, I hope, agree with me as to the fact that, from various considerations,—social, historical, and artistic,—architecture of a certain type is invariably associated, in the minds of a most observant and popular school of writers, with pleasant images; and further, that from the unique position which they occupy in the world of letters, it is reasonable to infer that they represent the public sentiment, and have, in fact, furnished us with a clue to the public sympathy.

The problem before us all is to maintain and increase our hold upon this sympathy, by cultivating those special charms and graces which our forefathers never failed to impart to their works, and by adding thereto those sanitary and other ameliorations of which a less fastidious age did not feel the need. The artistic instincts of your average client are not robust enough to put up with the smallest discomfort for appearance's sake. If your pretty ornaments let in the wind and the rain, nothing can save them. He will have them out on the first opportunity, and substitute for them gaping sashes, which will destroy at a blow the scale of your building. Our concern, then, is to see that they are weather-tight, and we may retain them. Gables and dormers mean gutters and flashings. Let us look to our plumbing. If that is defective, they, too, will go, to keep company with the ornaments, and our work will be robbed of a valuable source of effect. And so on through the whole catalogue.

The first desire of those who build is *comfort*. Like the aspirant in Tennyson's poem, their chief longing is "at ease" to dwell. Their house is a retreat from business and the "carking cares" of life; and everywhere within its walls you may read (with the mind's eye) "there is no joy but calm." Make, then, as a first step, your client perfectly comfortable, and, believe me, you will find that he is, like the rest of the world, amenable to the charms of a really and rationally artistic design. If he hesitates at the outset it is because he fears that something is to be sacrificed for effect. Disabuse his mind



of this, and the shape which the house shall take is practically wholly in your own hands. In determining that shape we ought, from every motive, to adopt a manner which appeals to the widest sympathies. For domestic work, there is one style which, in spite of all that may be said against it, has the overwhelming recommendation of being already established in the affectionate regard of the nation, and enshrined in our national literature, and it is to the further development of this style that we should, in my opinion, bend all our energies. You will, perhaps, ask why, if the public really enjoys this picturesque architecture of the sixteenth and seventeenth centuries, and we are in accord with the public preference, do you address us on the subject? I answer, because there are signs that we are on the eve of another change. Forgetting that it is one of the principal ends of art to appeal to the imagination, we are beginning to question the *rationale* of these mixed styles, and are investigating their character and antecedents. It has been shrewdly remarked that our passage from the genuine Medieval to the pure "Classico" was by way of these styles, and that we are now repeating the journey,—a journey which can only end in a revived *Classico*. This consummation is awaited by many with undisguised satisfaction, and the chorus of acclaim is daily increasing. In my humble opinion, it would be, so far as domestic architecture is concerned, a calamity. And therefore do I put in my plea (on grounds which I do not remember to have seen urged before). Upon you it will mainly depend what the architecture of the immediate future shall be. And I respectfully leave it to your judgment whether it would not be a blunder to adopt again an alien manner, which has nothing in common with our national habits or traditions,—and which probably no art can render permanently acceptable to the English mind; and to abandon a style in the revived use of which we have already attained a marked proficiency; which is flexible enough to meet all our wants; which lends itself to the employment of any material, however humble; which has been popularised and endeared to us by writers of enduring fame; which has its roots deep down in the national life and in the national memories; and which possesses, moreover, in a pre-eminent degree those attributes which never fail to charm alike the poet, the painter, and the man of letters.

## DISCUSSION.

The Chairman said that Mr. Bell had given them a delightful architectural pastoral, setting forth,—without many details, however,—what he would wish to see, and what, no doubt, many of them would wish to see. A dwelling-house, as Mr. Bell had rightly said, should be built in the style of the country in which it existed, and an English house should not look like an importation from Italy or elsewhere. How far Mr. Bell's ideals of dwelling-houses were compatible with modern requirements he had stopped a little short of telling them. Low windows, such as were a feature of the Tudor style, were hardly suited to modern requirements in the way of ventilation, and it was not likely that the generality of people would care to be obliged to go upstairs or downstairs in merely passing from one room to another. As to corridors, he quite agreed with Mr. Bell that a good corridor was a delightful feature in a building, but, at the same time, it was very wasteful. If it took the form of a long side-lighted gallery, in which pictures and other works of art could be placed, it formed a very charming feature in a building; but corridors which were mere end-lighted passages from one part of the building to another were very undesirable, and should be dispensed with wherever possible, even though they formed playgrounds which were very popular with the children of the house. As to the desirability of every house possessing a physiognomy of its own, he thought that the architect should try to get hold of his client's ideas, and then try to express in the building the character of the man (if he had any). Mr. Bell's remarks had dealt exclusively with ideal houses in the country, but something might usefully have been said on the subject of ideal town-houses.

Mr. Thomas Blashill had much pleasure in proposing a vote of thanks to Mr. Bell for his paper, which had been very pleasant in manner and matter, and was very far from being, in any part of it, short of real utility. He thought that Mr. Bell had been a little too hard upon

the *Classico* style, but he was inclined to sympathise with him. He (the speaker's) experience of Palladian architecture had not been very fortunate. Not very long ago he made a pilgrimage to the home of Palladio, Vicenza. On the day of his visit it happened to be raining hard, and he saw Palladian architecture from under an umbrella. The aspect was really miserable, and he felt very much as the unfortunate butcher mentioned in the quotation from Thackeray must have done. That was in what was ordinarily termed "sunny Italy." In this country the climate differed so greatly from that of Italy that they might very safely act upon Mr. Bell's advice and abstain from importing Italian styles. Dickens, in addition to the passage cited by Mr. Bell, gave a very interesting picture in one of his works as to the effect of history upon buildings, pointing out how much more interesting buildings were to us when we knew that great people had lived and died in them, and that their halls had resounded to the pattering feet of children who became famous men and women. But, because such associations were part of the old buildings of the kind which Dickens and Thackeray described, it must not be thought that a mere reproduction of the old forms in buildings which had no old associations would or could be as interesting as the old buildings themselves. With regard to "George Eliot," one remark which she made regarding architects was very unfortunate. It was to the effect that "Adam Bede could do work about a house very much better than it could be done by an architect." Such an observation, coming from a writer of "George Eliot's" judgment, was, it was to be feared, dictated by some bitter experience.

Mr. Gilbert R. Redgrave, in seconding the vote of thanks, said that the ideal houses which had been treated of by Mr. Bell were pre-eminently houses for the country, and they were, there could be no doubt, greatly helped by the landscape, of which they might almost, indeed, be said to form part. It would be very difficult to imagine houses of the kind which had been described set down in Gower-street or in one of the new thoroughfares of South Kensington. In addition to the authors who had been quoted, however, it should not be forgotten that there was another set of authors who had glorified, so to speak, another type of house, viz., the brown or dark red houses of Kensington,—the "Old Court Suburb." The influence of the literature of the next generation upon the architecture of the next generation had often been pointed out, more especially in connexion with the Gothic revival. Admitting the picturesque and charm of Haddon Hall and buildings of a similar type, it was, he thought, very questionable whether such buildings, if erected at the present time, could be made conformable to modern requirements.

Mr. Hampden W. Pratt spoke of the novels of Mr. Thomas Hardy as of peculiar interest to architects, seeing that before Mr. Hardy became a novelist he was an architect. Mr. Bell had very rightly insisted upon architects making it their first study to build comfortable houses, superadding to comfort artistic appearance as far as the means available would allow. To sacrifice comfort for appearance' sake was not a thing that would be done by any architect worthy of the name. Those who would pursue that course were quacks, not properly-qualified architects, and it was such men who brought discredit on the whole profession.

Mr. Cole Adams said that, much as we might love such old houses as had been so graphically described by the authors mentioned, and much as we might reverence them for the sake of the associations connected with them, was it desirable, even if it were possible, to reproduce them? He thought not. He saw no reason why honest building done at the present time should not acquire the charm that attached to buildings of a previous age.

Mr. A. B. Pite thought that picturesque should not be purposely aimed at in house-building. If a client's requirements were carefully studied and honestly met, picturesque would take care of itself. It was a remarkable thing that all good building improved in appearance with age, while, on the other hand, it was only bad building which looked well when new.

In the course of a few concluding remarks, Mr. Bell expressed himself as touched by the extreme kindness with which his paper had been received. He had anticipated the very natural criticism that Thackeray, Dickens, and "George Eliot" had not inhabited the kind of house they

so lovingly described; but fearing his paper would be too long for his audience he had skipped that with other matter. As to the question of corridors, he would take this opportunity of saying that he was no advocate for the end-lighted corridor, his preference was wholly for the broad side-lighted gallery, with fireplaces at intervals along one side, and bay-windows on the other; an apartment, connecting the principal rooms, and which might be used for dancing, as in Elizabethan times, or for an indoor promenade in inclement weather, and for indoor exercise and recreation in many forms. With reference to some remarks which had been made as to economy in planning, it would, of course, appear on reflection that,—leaving the circle out of account,—you get the greatest superficial area with the least perimeter by the use of the perfect square, and the greatest cubical space with a given expenditure of material by a perfect cube. So that if economy be the sole aim, a house should consist of perfect cubes comprised in a perfect cube. But that was not art. Any departure from that figure for the satisfaction of the æsthetic sense was, *pro tanto*, costly,—and why not? Art was worth paying for, and could not be weighed against strictly economical considerations. As to high versus low windows, if it were said that high windows were provided with the view of securing ventilation, he thought it easy to show the futility of such an arrangement. It seemed to be tacitly accepted as sound theory that if lofty windows in a heated apartment were opened at the top the hot air would go out; whereas the effect would be that instead of the heated and vitiated air passing out at the top of the windows, the cold air from the outside would fall into the apartment, rendering a great portion of it uninhabitable. As to the possibility of reproducing the manner of the old houses while meeting the needs of the present age, the thing had been done by architects whose names would occur to all his hearers.

The meeting then terminated.

## THE EDUCATION OF THE ARCHITECT.\*

THE position of a follower of architecture is a peculiar one. Unlike a painter or a writer, his powers of expression are bounded rigidly by the demands of constructive science, by financial considerations, and the needs of another, and perhaps unsympathetic, party. All efforts in the direction of originality are to be subservient to utility. However beautiful in appearance, however fruitful of picturesque or artistic bits a building may be, if it does not fulfil the purposes of its erection, it must be accounted a failure, and its originator a man unreliable and unworthy of support.

This fact, the overwhelming one of the architect's life, should be the motive influence of all his office training. His earliest efforts should be directed to this consideration. The first and most important item of knowledge that an architectural student should acquire ought to be, that an architect is the servant of science; that all his works, practical or artistic, are founded upon its teaching; that however beautiful and charming to the eye a design may be, if it is not sound in construction, if it does not obey the laws of science applied to buildings, its author is one not to be admired and courted by his fellows, but one to be despised and looked upon with contempt. I do not know that any feature of the times, as far as architecture is concerned, is a sadder one than the development of a good deal of the work done of late under the name of Queen Anne. Mind, I am not altogether deprecating the style. There are many admirable features about it, and it certainly has done good service to art. But I do call in question a great deal of the application of it. Whilst the Gothic revival lasted much of the work done under it was carried out on the sound principle of overlaying the ornament on a well-constructed skeleton, which it clothed, indeed, with flesh, but whose form and logical purposes were properly preserved and emphasised. But with a great deal of the Queen Anne work the constructive framework of the buildings has no expression, either externally or internally. The constructive portion is one thing, the ornamental quite another. They have no reference to each other. Even where the basis is sound

\* From "A Real and an Ideal Architect," a paper read before the Leeds Architectural Society, by Mr. J. Wreghitt Common, F.R.I.B.A.



and properly put together, it has no influence on the clothing of design. Beauty, so called, is added to the bare building, to which it has no proper artistic attachment, and from which it might be removed, and taken elsewhere, or replaced by other and altogether different features, and the building be yet wholly unaffected. Now unquestionably this is the outcome of an improper early training. The education given is not logical and rational, but haphazard and tentative. To expect construction and the science of building to be learnt by sketching is as absurd as to think a doctor could learn anatomy and physiology by drawing a draped figure. The medical student commences by dissection. He investigates the skeleton, the framework upon which the flesh and muscles are covered. Least of all does he trouble himself with the covering of cloth or silk, or cotton, that artifice used to conceal nature. The modern architect's mode of procedure is just the reverse of this, and is just as irrational and absurd as the other is reasonable and praiseworthy. He goes forth, note-book in hand, and sets down in dainty black and white, or delicate colour, the bows and ribands, the lace trimmings and fancy work of the architectural figure. It is a pleasing pursuit. The student gains health and robustness in the open air, with an inner satisfaction of conscience that he is laboriously acquiring a knowledge of his profession. But does it serve in the day of trial? When prospective clients demand cheap construction, the beautiful visions of youth decline to translate themselves into modern bricks and mortar; a frantic appeal to Nicholson produces a solution to every problem but the one set the despairing architect. No doubt, the task is done, but how? With shores and props, and mysterious rods inserted where palpable decrepitude demanded them, but applied without system or science, and speaking in every corner of its author's ignorance of the art he professed.

A complete architect has a threefold character, as I said before,—that of a constructor, a man of business, and an artist. The two latter are largely congenital. They can be cultivated and improved, modified and assisted; but can scarcely be taught in one who has no natural bent in their direction. Time and experience can alone test ability in them, and time and experience will make them felt if they are present at all. Nor are they in an abnormal degree, absolutely necessary. Mind, I do not say they are unnecessary, but not necessary absolutely to this degree. A man may make a very fairly satisfactory architect in some lines of work, and be no artist. The largest majority of our architects are not artists. A considerable number of the most highly esteemed amongst them are not. Nor is it perfectly essential that, in any special degree, he should be a man of business. It is desirable, very, that he should be so, yet he may be fairly successful without much business capacity; but a constructor he must be. The public have a right to, and do expect, that every architect should be this. Would any client be so demented as to wait upon one of us with a commission if he was sure that scientific skill in dealing with materials was at zero; or that the professional man he consulted was incapable of passing the first standard of the architectural infant school? Without a knowledge of construction one cannot be an architect, and a thoroughly intimate acquaintance with it is of so much importance that it should be taught with the exactness of a course of mathematics, and certainly not in the chance way characteristic of existing systems.

Of course this chamber acquisition of knowledge must be supplemented regularly and constantly by outdoor application of its teachings. The information that smells of the midnight-oil is insufficient without it has received the test of having its teachings applied to the real work around. The study at the desk must go hand in hand with the workshop and the bench. The importance of this is so palpable and indisputable that I scarcely care to enlarge upon it, further than to say that the methodical survey of actual works in progress is an essential part of a student's training, and must in no wise be neglected.

Our ideal architect having gone through his course of preliminary training and his term of pupillage, it is surely desirable that some mode of testing the extent of his acquirements should be applied. I am no very enthusiastic supporter of examinations *per se*. Certain valuable mental qualities, such as tact and readiness of resource, can scarcely be proved by them, and

to a small extent their results are a little subject to accident and the favours of fortune. But the main point always remains. We have no other test that can be applied as a means of approximately arriving at the measure of a person's scholarly attainments. It is Hobson's choice if we are to have any trial of capacity at all. The time has now come when, in the interests of each genuine member of our profession, we shall be able to say of every new architect,—This man has satisfied us that he possesses acquired knowledge of mathematics, applied science, construction, and the literature of architecture to a sufficient degree to justify clients in giving him their confidence.

#### A PRACTICAL STUDY ON VENTILATION. THE LONDON CUSTOM-HOUSE.

Sir,—Attracted by a grandiloquent and laudatory report upon "Experiments at the London Custom House with Boyle's System of Ventilation," published in and republished from *Industry*, January 22nd, 1881, and by the names of the distinguished scientists who conducted the said experiments, among whom were Dr. B. W. Richardson, F.R.S.; Captain Douglas Galton, C.B., F.R.S.; Dr. Corfield, Professor of Hygiene, London University College; Sir John Monckton, Town Clerk; E. Shepherd, Collector, H.M. Customs; Ernest Turner, F.R.I.B.A.; Rogers Field, C.E.; Bailey Denton, C.E.; A. Murray, City Architect's Office; and a large number of representatives of the public press, I recently took an opportunity of inspecting the results, hoping to learn much therefrom on the important subject of ventilation of public buildings.

I am free to confess,—I write, of course, as a fool,—i.e., an architect,—that in this particular instance a mountain in labour has produced but a mouse, and that but a sorry and inefficient one, since the lion it was expected to deliver remains yet in its bonds. To drop metaphor, I found that all the Tobin tubes, although recently doubled in height to improve them, were crowned with piles of ponderous ledgers, one apparently having been thought insufficient protection against draughts, or the possible danger of being blown off by their violence, by the Customs clerks.

Yet the problem to be solved in this case was a simple one, and the means adopted were simple also; still their simplicity was less than that of the expectations indulged in that a satisfactory issue could be produced by them. Their failure is much to be deplored as tending to bring ridicule upon, and want of confidence in, the judgment of those who are endeavouring painfully to gain the public attention to a great want, and to forward the interests of sanitary science.

The room experimented upon, "the Long Room, one of the largest in the world," is indeed a vast one,—94 ft. long by 60 ft. wide and 54 ft. high containing 582,000 cubic feet of air space. It is occupied by a numerous staff of clerks, and is considerably thronged by the public. Nevertheless, it was built without any provision for fresh, or for the extraction of foul, air, save by windows, which, being of course kept closed in cold weather, are practically useless. It seems to have been thought that its very size and capacity were sufficient, and that the amount of air it contained would maintain its purity, or be possessed of powers of reconversion for all time.

Such hopes, if indulged in, soon proved fallacious, and the room became a vast reservoir of bad and exhausted air, and the numerous deaths from pulmonary complaints which occurred among the clerks engaged in it, compelled attention to its condition soon after its erection. Professor Faraday and Dr. Ure, so far back as thirty years ago, officially reported that it was one of the worst ventilated rooms in London. The immense size of the room, upon which reliance had previously been placed, was then declared to be in fault, and to be the cause of the difficulty of the problem. Certain supposed improvements were suggested and carried out, which were simple enough, but simply useless. The marks left by these are still to be seen, and may be studied with advantage, as showing one very ingenious method of how not to do it. Large circular iron gratings were inserted in the floor, and the appearance of these must have given the gasping clerks comfortable assurance of an ample supply of the air for which they were panting. Alas! the expectations raised were worse than delusive, for

these gratings actually opened only into the room below,—used as a warehouse,—and acted as vents for its foul air, which was even more foul than that in the room above.

Traditions exist of much and continuous manual labour having been employed to pump up this fresh supply, but whatever means were used, their futility became at least apparent, for now these gratings have nothing but their appearance to recommend them, having had solid plates carefully screwed up beneath them. All this time it never seems to have occurred to the experimenters that even to ventilate a small box, holes at the top as well as at the bottom, are an essential requisite.

To pass, however, from this quasi-playful attempt to palliate the evil and grapple with the difficulties of the problem, to the recent one recorded in the report, it is stated that this latter has been carried out by the firm named, under the direction of Her Majesty's Board of Works, and that the system applied by them is a combination of their well-known air-pump ventilators, with vertical tubes as inlets.

Now, in winter this vast room had previously no foul-air outlets of any kind. There were and are windows at each end and near the ceiling, and five valves along each side of the arched ceiling, into a space between the ceiling and the roof; from this space there was and is a very large lobster-back cowl "for the purposes of ventilation." Neither the windows nor valves, however, were or are opened in winter, on account of the intolerable down-draughts they would occasion.

There were, and are, two large coal-fire stoves in the room, which have an encouraging appearance by reason of the amount of perforations in parts; these, however, are not supplied, as they obviously should be, with fresh air from outside the building, but actually only suck in air from within the room itself, and re-deliver it heated above, so that the only ventilating office that even these stoves fulfil is by the extraction of a comparatively small amount of air by their smoke flues, which descend and are conducted by pipes suspended beneath the floor into chimney-shafts carried up on the river side of the building. The only inlets for air are the entrance doors, close together on the street side of the room; only two of these are opened, and that but occasionally, as people enter or leave, and they merely open from a large ante-room, also without any means of ventilation whatever, except by the occasional opening of doors at either end from staircases again guarded from draught by doors below. The consequent condition of the atmosphere in the large room may well, therefore, be believed to have been as described in the report, that "when the gas was lighted, the heat and sulphurous vapour was intolerable, and the source of great discomfort and injury to the occupants of the room."

To correct this state of things, the following were the palliatives recently carried out and experimented upon:—

Six ventilators, of apparently 3 ft. diameter, were placed in the ceiling, from each of which a shaft, 1 ft. 6 in. in diameter only\*, subdivided into four parts by crossed partitions, was carried above the roof, and there surrounded by cowl arrangements.

Thus six very moderate-sized openings for the escape of heated air were provided, supposing these ventilating appliances unimpeded by wind blowing on to them, or into the openings on the windward side.

For the supply of fresh air, the only inlets into the room are twelve vertical tubes, each 10 in. by 8 in., placed in the bays of the windows, and communicating with the outer air through gratings (the area of openings in which only should be calculated). The report says that, "on testing these air tubes an abundant supply of air was found to be passing into the room, which will prove, and especially in summer [when the windows might be opened and their assistance dispensed with!], of great benefit to the occupants." The said occupants have, however, since hermetically sealed them by piling a stack of ledgers upon the mouth of each of them.

Now, as to the experiments extending over five days and the "tests" employed, it is difficult to understand how these could have been made, so as to have arrived at all accurately as to the number of cubic feet discharged through the 18-in. air-shafts. To be true, the tests should have been applied at the bottom of these or ceiling ends of the shafts. The exhausting power

\* The strength of a beam is its weakest part.



could only have been operating in two of the divisions of each shaft at one time, and, as a fact, it is sometimes operating only in one; and there would be actually down-draughts through others in cold weather; and the area in operation is even further reduced by the cowl arrangements at the top of the tubes, which are dependent upon the stiff action, or want of action, of the wind upon their several sides and slits.

So much for the capacity and efficiency of the outlets provided. Then as to those of the inlets: even when not closed up by ledgers, the tubes are ranged only on the riverside of the building, from, according to the report, "it not being considered advisable to admit air from the north side, taking into consideration the odouriferous character of the atmosphere actually found in Thames-street."

These inlets consist of open holes, 2 ft. by 1 ft., in the walls (less solids in gratings?), 288 in. super, having two vertical tubes from each, 10 in. by 8 in., or 80 in. super. each, or 160 in. together. These tubes at first ended some 5 ft. from the floor, and were unprovided with any regulating valves. The rush of cold air being found unbearable, the tubes were afterwards doubled in height, but apparently with no better result.

Now, it must be admitted that six openings of any sort in the roof and twelve from the floor, if not closed, are some improvement over none whatever; but, nevertheless, the proper practical ventilation of the Long Room of the Custom House remains yet a problem to be dealt with.

It becomes, therefore, an important question, What was the value of the experiments made by "the scientists and others"? It would be desirable to know how they ascertained the rate of exhausting power or escape of air in cubic feet, for by the experiments at Kew the rate of speed through a 2½-in. anemometer was called a cubic foot of air.

The uselessness of the inlets in this case would appear from the statement in the report that, "on comparing the action of the ventilators with the room in a closed state with the action when the inlets were open, a difference of only 25 ft. per minute was discernible." Again, the temperature in the room is said to have been 60°, and that outside about 40°. The total air-space in the room is stated at 600,000 cubic feet; the fluctuating average speed, as tested by Mr. Rogers Field, to have been 525 ft. per minute; for six ventilators, 3,150 ft. per minute, or 189,000 ft. per hour. Dr. Richardson made it considerably more than twice as much. Which was correct? We are, however, told by Dr. Parkes that the air of a room should be changed three times an hour.

On the whole, the statement in the report that congratulations are due for the success of the work done is not borne out, for the result appears, on the contrary, to be an absolute failure; and yet the problem is a most simple one, and in no way rendered more difficult by the size of the room. It is easy to adjust the size of the inlets and outlets required for their respective purposes, and to arrange their exits so that the former may deliver the supply of air without creating draughts, and that the latter be not impeded, but assisted, by their appliances under all circumstances. It is surely possible, also, to apply tests with accuracy, and so avoid the error of such an endorsement of a practical mistake, by misapplication of scientific experiment, as has unfortunately occurred in this case at the London Custom House.

JOHN P. SEDDON.

#### WOOD PAVEMENT.

Sir,—Having for some years given much attention to the true principles which should be followed in the use of wood for street-paving, you will perhaps allow me to add a few remarks to the correspondence on that subject now appearing in your valuable journal.

I was glad to learn the opinion on the subject of so great an engineering authority as Mr. Rawlinson. And since he appears to have revived the subject with a view to elicit discussion, I trust he will not consider me presumptuous in stating that, though I consider the system he advocates a move in the right direction, it will be readily understood that there are several points both of principle and detail in which I differ from him, my views of the right principles of construction being principally as follow:—

1. Solidity of foundation, such forming the true road.

2. Protection of foundation from surface-water and impact of the traffic, by the interposition of an elastic and impervious medium between the bed and the surface blocks.

3. The most economical use of the surface-material (wood), that in a properly-constructed road being the only portion which should require renewal, and should only be used in such quantity as would give a depth necessary to provide for the wear caused by surface-attrition, with the least possible residuum when surface irregularities entail renewal.

4. Such an arrangement of the surface as would afford the greatest uniformity and smoothness consistent with a secure foothold and durability.

I will now endeavour to show how far I consider that Mr. Rawlinson's suggestions meet or fail to meet the above conditions.

1. A sound concrete foundation, as he suggests, is the first requisite; but with a road such as I will describe, fresh-burnt ground lias lime will prove quite as durable as cement, except when laid during very wet weather, and be less costly.

2. The elasticity required by the intervening layer is not that of a mattress, but that of a billiard-ball. Tarred felt does not possess this quality; it is, moreover, liable to admit the passage of surface water at the joints, and is retentive of moisture, thus liable to promote decay in the blocks. Whereas a thin asphaltic layer exactly fulfils the conditions of a proper elasticity and of imperviousness. Moreover, it is of such a consistency as to add also to the solidity of the foundation; and, in consequence of its perfect imperviousness, renders a less depth of concrete equally efficient.

3. The surface blocks should be effectually united to each other by keys, cementation, or by both; and, still better, they should also be firmly held down to the bed. The strains from passing loads are thereby distributed over a larger area of foundation, and the stability of the blocks is not dependent solely upon their depth, thus rendering a deep and expensive block necessary, and which must be renewed long before it has become worn down by the traffic. These requirements are met by laying the blocks with a narrow space between each course, the lower half of the spaces being run in with hot asphalt; this also enters auger-holes, which should be bored a short way into the blocks near their base, thus firmly cementing them to each other with an impervious and preservative material, which also holds them securely to the bed, forming with it a firm monolithic slab, extending the whole width of the road, and distributing the strains from passing loads over the largest area of foundation, which is thereby not required to be so thick as when the shocks of the traffic are transmitted through the medium of independent blocks. It is thus also possible to employ the smallest quantity of wood actually necessary to provide a surface for the traffic till it becomes so far worn as to require renewal, blocks so laid remaining firm till they are worn within an inch of their bed: this is impossible in other systems, which depend solely on the depth of the block for solidity. The economy thus effected must yearly become more apparent, as the consumption of the proper kind of timber steadily increases, causing a steady rise in price, as during the last few years.

4. The joints Mr. Rawlinson suggests may produce a quiet and smooth surface, but another most important requisite has to be considered also, viz.,—the maximum safety of foothold consistent with quietness, durability, and uniformity of surface wear. I contend that this is not met by the system he advocates, there being no sufficient joint to secure a grip for the horse, the very nature of the material placed between the blocks being such as to produce a greasy exudation, which intensifies the one condition in which a wooden pavement is likely to become slippery. The true solution consists in the adoption of a joint which shall be just sufficiently wide to give a grip to the horse without forming too great a rut in the surface. This was attempted at first by comparatively wide joints packed with gravel or loosely filled with coarse concrete, and failed as regards uniformity of wear. Experience has shown that by reducing the joints and filling the upper portion with coarse cement grout, they will wear uniformly with the wood, and all the above conditions will be met, particularly

if the pavement be allowed to remain one or two days after completion before the traffic is turned over it.

5. The quality of the timber is of the first importance, and, as with the width of joints and uniform height of the blocks, was a point which did not receive sufficient attention till recently, though on all of these I have always insisted. The wood should be perfectly free from sap or dead knots, and hard, well-seasoned red pine, not white, as mentioned by Mr. Rawlinson, the resin contained in red pine being conducive to its preservation, without being so much in excess of its fibrous constituents as to create greasiness; whereas white pine contains less resin, and is less firm in the fibre, therefore more retentive of moisture, and decays more rapidly. In proof of the importance of the class of timber used, I may remark that a piece of pavement laid on the system I have referred to, with red pine blocks only 3½ in. deep, on 4½ in. concrete, with ½ in. layer of asphaltic intervening, has now been subject to the heaviest traffic of an important seaport town for six years and a half, and is still in good condition, though no repairs have been made; whereas a road paved on the same system, with 6 in. white pine, and subject to much lighter traffic, required re-laying within two years, in consequence of the want of durability in the timber. The above example will also show the waste involved in laying the deep blocks and unnecessarily thick bed of concrete at present so often used. The total depth of material really required on the system I advocate seldom exceeds 8 in., even under heavy and quick traffic, and, indeed, is much less when the traffic is light. In fact, it has been in constant use during the last two years and a half for tramway traffic, with 3½ in. blocks laid in ½ in. of asphaltic and 3½ in. of concrete, is still as good as when first laid, and apparently will not require surface renewal for at least another three years. The economy in the original cost of excavation is evident, as also in the subsequent expense of maintenance.

Referring to the letters from your other correspondents, I am not surprised at the anxiety of the people of Norwich, as, from the description of their pavement, it does not possess one quality conducive to durability. Similar pavement has been laid in England at intervals during the last forty years, and largely in America, but has always failed, and, though cheap at first, will prove excessively costly and inconvenient to maintain. I can only feel surprised that the Local Government Board should have sanctioned such an outlay, if they had been fully informed as to the nature of the pavement to be laid.

The only way to insure economy is to work upon the principles I have indicated, reducing the depths of blocks, &c., in proportion to the traffic, and so constructing the roadway as to confine the wear practically to the surface material. By that means, though the first cost may be in excess of that named by Mr. Marshall, such a reduction may be made in the present extravagant use of timber as would reduce the original outlay to the minimum consistent with durability, and materially diminish the cost and inconvenience of maintenance.

HENRY S. COPLAND, C.E.

#### FIREPROOF CURTAINS FOR THEATRES.

Sir,—Noting that you have ventilated the subject of fireproof curtains for theatres in your pages, I beg to mention that the system advocated by Herr Pfaff, as set forth by you, for raising and lowering the same by hydraulic means, coincides in a great measure with the system I have for some time advocated with persons interested,—that portion of the arrangement dependent upon the supply of water from the main excepted. I use a small accumulator, which not only acts as a counterbalance for raising the curtain, but is ready at any time, without depending on the main supply, and by my arrangement any number of small outlet valves, with levers attached, can be placed in various parts of the house, or even in the public thoroughfare itself, for the purpose of lowering the curtain in the event of fire occurring in an inaccessible position for obtaining access to any of the valves within the building.

The enormous weight of ironwork contained in the framing, water-girders, columns, curtain, and counterbalanced weights in Herr Pfaff's arrangement would be, in the case of a stage



say 30 ft. by 30 ft., a very serious matter in itself, without taking into consideration the drawback of the expansion of iron by heat, which is likely to cause the curtain or screen to stick fast in the grooves.

I advocate a double curtain made on the principle of a Venetian blind, the material being attached to the tapes on each side, the length of the laths forming the width of the curtain, the ends working up iron grooves built in the brickwork, the material and laths being prepared in a fireproof solution, or preferably the former made of woven asbestos, and the laths, after preparation, painted with asbestos paint as a further safeguard. A double curtain of this description weighs only about half a ton.

Two water-mains, perforated their entire length, are fixed one on each side of the cords at the top under the supporting lath or girder, carrying the curtain upon this lath the jets play upwards, the water being projected from thence on to the top of the two inner sides of the curtain material, which it keeps thoroughly saturated. The descent of the water, except when in a stream down the curtain, is partially arrested by the formation of the curtain-laths, which compel it to do its duty by causing it to be continually projected against the sides in the event of its running off the surface before it reaches the bottom.

The jets are brought into play simultaneously with lowering the curtain, held in position at the sides by wire-rope up which the laths, and consequently the curtain, slide in the grooves.

Many minor points of detail could be mentioned, such as spring cushions for the ends of the bottom lath to fall upon in case the curtain should be lowered too suddenly. Gutters can be built in the brick piers to run off the surplus water after it has done its work, and to prevent damage in the event of a false alarm, fire drill, &c.; although for fire drill the levers of the valves on the water-main may be disconnected from the lowering apparatus.

There are no complicated water-columns, girders, or heavy framing, as in Herr Pfaff's arrangement. The top supporting lath or girder contains the runners for the cords to pass over, and is fixed to and rests upon the brick piers usually built on the stage side of the proscenium, supported at intervals and cased in with stout sheet iron. The curtain grooves are also formed in the piers mentioned. In consequence of the curtain being double an increased panic amongst the audience would be prevented when it is down, as smoke, or the rays of light from fire are prevented from penetrating through wet double material. JOHN H. TYLER.

#### LYCIAN REMAINS.

ABOUT forty years ago, Herr Schönborn, a German traveller, paid a visit to Asia Minor, and spent some time in that part of the south-west of the Peninsula which, in ancient times, was called Lycia. Upon a hill, 3,000 ft. high, near Hekova Bay, he succeeded in discovering, among the ruins of an ancient city, the remains of a large edifice, which was profusely decorated with reliefs. In the middle of this structure he found the remains of a colossal sarcophagus. The discovery had been practically forgotten until, two years ago, the spot was visited by Dr. Benndorf, Professor of Archaeology at Vienna University, who found the remains just as they were described by the earlier traveller. The edifice, with the sarcophagus, was declared by Dr. Benndorf to be the tomb of an ancient Lycian mountain prince. The walls he found covered with an exceedingly interesting series of reliefs of a mythological nature. They formed a double frieze of 90 metres in length, and were 4 ft. high. They are estimated by Professor Benndorf to belong to the fourth century before Christ. Upon these facts becoming known in Vienna, a number of gentlemen came together and succeeded in collecting sufficient funds to purchase and bring these interesting remains of ancient art to the Austrian capital. The Emperor Francis Joseph, on hearing of the matter, approved of the design, and rendered all assistance in his power towards realising it. By the intervention of the Austrian Ambassador in Constantinople, a firman was obtained from the Sultan empowering the promoters of the undertaking to take possession of the remains, with a view to bringing them to Vienna. It has, therefore, been resolved to fit out an expedition under Professor Benndorf, who will proceed as soon as possible to Lycia to secure these

treasures for Austria. The Emperor has given his permission for the reliefs and other remains, when they arrive, to be permanently placed in the Court Museum of Historical Art.

#### GROWTH OF THE AMERICAN RAILWAY SYSTEM.

THE growth of the railway system of the United States is one of the most remarkable items in the entire field of industrial statistics. The 8th of October, 1829, may be called the birthday of the railway system, as having been the day on which the locomotive trials were commenced at Rain Hall, on the Liverpool and Manchester railway. The earliest year for which we have official returns of the length of English railways is 1854, at the close of which 8,053 miles of line had been completed in the United Kingdom. In 1830 twenty-three miles of railway were open in the United States. By the end of 1840, 2,818 miles were open. In 1850 the length rose to 9,021. In 1854 it was a little more than double the length of English lines, being 16,720 miles. By 1860 the aggregate rose to 30,635 miles against 10,433 in the United Kingdom. In 1870, the respective lengths were 52,914 and 15,537, and at the end of 1879, 82,223 and 17,696 miles respectively. The total length of the railroads of the United States at the close of 1880, including some lines which do not report their earnings, was 93,671 miles.

It thus appears that if we compare the growth of the railway system since 1854 in the United Kingdom and in the United States, there has been a steady increase in the former at about the rate of 3 per cent., and in the latter at about that of 4½ per cent. per annum. But when we consider, not length of line alone, but length and cost together, the contrast is more remarkable. The lowest cost per mile of an average English railway is that shown by the returns for 1866, in which year the cost per mile of line open was 32,804. From that date the cost of the railways of the United Kingdom has steadily increased, till, in 1880, they have cost 40,613½ per mile open. The American railways, on the contrary, have decreased their costliness, the average cost of a mile open in 1871 being nearly 12,000, and in 1880 only about 11,600. The total capital returned as expended in 1880 was 978,500,000. in the United States, and 802,000,000. in the United Kingdom. The average gross earnings of the American lines was 1,460. per mile, of which 41½ per cent. was net revenue. The United Kingdom lines averaged nearly 3,700. per mile of gross earnings, of which between 48 and 49 per cent. was net revenue. Thus the American lines cleared a dividend all round of 5·2 per cent., against 4·04 per cent. on the English lines.

The total length of railways in the world at the commencement of 1880 was calculated as:—

	Miles.
Europe .....	102,593
Asia .....	8,983
Africa .....	3,024
America .....	100,867
Australia .....	4,388
Total .....	219,805

#### SWISS HOTELS.

SWITZERLAND, long the most favourite resort of tourists from all parts of Europe, is celebrated above all Continental countries for its hotels. The architect in his Alpine tour may there see the Continental hotel system in its most improved form. In the year 1883 it is intended to hold a National Swiss Exhibition; and one of the groups (No. 41) will be devoted entirely to illustrating the hotel system of Switzerland. There will be exhibited plans and models of all the most important hotels of the country, together with photographic views of the exterior, and the surrounding grounds, and the chief apartments of the interior. There will also be maps showing the position of each establishment. The different portions of this Group of Objects in next year's exhibition will comprise:—(1) Diagrams showing the increase of visitors from abroad and their influence on the hotel system of Switzerland; (2) representations of different classes of hotels from those of the first rank down to the most primitive village inns; (3) the internal arrangements of the different classes of hotels and inns; (4) illustrations of special

arrangements and appliances, like baths, steam-engines, water supply, and heating apparatus; (5) "Cur" establishments or hotels for invalids with their special peculiarities; (6) illustrations of the grounds, parks, and gardens attached to hotels; (7) climate; (8) statistics of all establishments in Switzerland used mainly by foreign visitors.

#### THE LATE R. R. ARNTZ, ARCHITECT.

ON the 17th of February last, at the age of sixty-six, Robert Richard Arntz gave up his work, and in his case it is no figure of speech, for he was at work up to within a fortnight of his death; then severe illness seized him, from which he never recovered. A stronger man might, in all probability, have weathered the attack, but it came upon a frame which had lately taken no rest or relaxation. Mr. Arntz was possessed of a singularly clear judgment, and as a surveyor was in the foremost rank; of a most retiring disposition, never asserting himself for his own benefit. He is, perhaps, not so widely-known as some other men of less real ability, but to those who did know him, the truth of this remark will be apparent. Fair, upright, and truthful, employers and employed who knew him in business will ever respect the memory of a man who fearlessly strove faithfully to fulfil his duty in the sphere in which he was placed.

Mr. Arntz held the post of Surveyor to the Westminster Board of Works for some forty years, including the time before it took the title it now holds. To this work he devoted generally half of each working day, and it would be impossible to speak in too high terms of the way in which his duties to the Board were discharged.

Mr. Arntz's chief architectural works were the United Westminster Schools, a plain building architecturally, but well adapted for its purpose, showing thought and careful consideration throughout. The United Westminster Almshouses, now in course of erection in Rochester-row, Westminster, are also his, a more ornate group of buildings than the last-mentioned.

Mr. Arntz was elected a member of the Institution of Civil Engineers on Feb. 5th, 1856, and at one time was frequent in his attendance at the meetings of that body. He was elected a Fellow of the Society of Antiquaries on December 11th, 1862; and was also a member of the National Association for the Promotion of Social Science.

#### THE LATE MR. HEATON.

WE have, with much regret, to record the death of Mr. Clement Heaton, the senior partner in the firm of Heaton, Butler, & Bayne, the well-known artists in stained glass and church decoration.

Mr. Heaton had an extensive knowledge of nature, and the skill to apply it to decorative art. He was always anxious to do good and honest work, and among other important matters on which he was engaged may be mentioned the extensive decorative work at the Rochdale Town-hall, Manchester Town-hall, the Merchant Venturers' Hall, Bristol, the Chapel of Trinity College, Cambridge, and the English Chapel at St. Petersburg. The last work on which he was engaged was the decoration of Eaton Hall, Chester, under the superintendence of Mr. Waterhouse, for his Grace the Duke of Westminster. The funeral took place at Watford on March 1st. There was a very large attendance of relatives and friends. Among those present were Mr. A. W. Blomfield, M.A.; Mr. Alfred Waterhouse, A.R.A.; Mr. John Lee; the partners of the firm; and a large number of employees.

**Smoke Abatement.**—The Gas Institute, after their meeting at the Crystal Palace last week, visited South Kensington, where the gas-fired bakers' oven and gas-pottery kiln have been kept in operation for a series of practical tests. A large deputation of the Master-Bakers' Association paid a second visit, and took part in trials of bread-baking, which were considered satisfactory. Messrs. Huntley & Palmer were represented at the trials by Mr. Alfred Palmer. The application for space at the Manchester Exhibition, which will open on the 14th inst., has been very numerous. Gas-engines, of higher power than any hitherto used in England, will be among the new exhibits.



DEPOSIT OF PARLIAMENTARY PLANS  
WITH LOCAL AUTHORITIES.

At a recent meeting of the West Ham Local Board, Mr. Lewis Angell, C.E., called attention to the inconvenience of the antiquated Standing Order of Parliament requiring the deposit of railway and other plans in November with the "Parish Clerk," whereas such deposits should now be made with the Local Board or other authority whose duty it is to take cognisance of such matters. In accordance with this suggestion, Col. Makins, M.P. for South Essex, has prepared an amendment to Standing Order, No. 29, which has been accepted by the Chairman of Committees and the Local Government Board, to take effect at the end of the present session, after which Parliamentary plans affecting any district will have to be deposited with the Local Authority.

## ARCHITECTS' BENEVOLENT SOCIETY.

The thirty-second annual meeting of this Society was held on Wednesday afternoon, in the meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. John Whichcord, F.S.A., President, in the chair.

The annual report stated that the modifications sanctioned by the last annual general meeting of donors and subscribers have greatly facilitated the conduct of the Society's affairs. The number of cases relieved during the year 1881 was 50, and the grants made amounted to 381. These cases included applications from Scotland and distant parts of England, as well as from the metropolis. The Council have to deplore the decease during the past year of several contributors to the Society's funds. Three well-known men,—Mr. Decimus Burton, Mr. Anthony Salvin, and Mr. G. E. Street,—passed away in December last, all of whom evinced great interest in the proceedings of the Society. With societies, as with individuals, the loss of one's earliest friends is attended with the keenest regrets, for they leave a void behind them which cannot be fully replaced. The lamented death of Mr. Street has caused a vacancy in the number of trustees, to fill up which the Council have nominated Mr. George Godwin. The income account and balance-sheet for the year ended December 31, 1881, have been duly audited by Mr. J. Henry Christian. A then slight indisposition prevented Mr. Arnitz from meeting his brother-auditor on the occasion of the audit, and his subsequent death has rendered it impossible to obtain the signatures of both the auditors. The Council, however, trust that under the circumstances the annual general meeting will be satisfied with the careful examination made by Mr. Christian of the Society's accounts. The donations received during the year 1881 were invested in January, and the amount of invested capital has now reached the sum of £5,500. New Three Per Cent. Stock. With reference to the expenses, the sum expended in 1880 was 50*l.*, while in 1881 it was 39*l.*, making a reduction of 11*l.*, and this in spite of the fact that the printing of new By-laws, and lists of donors and subscribers, involved an outlay of more than 25*l.*

The Council cannot but recognise with feelings of satisfaction the liberal aid and assistance already bestowed by the comparatively few members who continue contributors to the Society; but deem it necessary to remark that the available funds for distribution are quite unworthy of the character and position of the profession, and inadequate to meet the increasing claims pressing for assistance with that relief which, in numerous cases, ought to be granted. The Council are not without a well-founded hope that the Society will annually be more and more generally recognised by the large body of the profession, and especially by the very large (cession of gentlemen who have recently been elected as Fellows and Associates of the Royal Institute of British Architects. The Institute now numbers more than a thousand professional members, not a fourth of whom contribute to the Society's funds. The Council in all kindness earnestly solicit their influence and support for the Society, which it is essential to the interest and respectability of the profession to maintain on a sound and permanent basis to effectually carry out its charitable objects. To administer relief and consolation is at once the privilege and duty of all in the profession who are so far fortunate as to be blessed with the means of doing so, remembering always that "without charity we are nothing worth."

The balance-sheet showed the receipts for the year to be 478*l.* 13*s.* 10*d.*, including 13*s.* 9*d.* brought forward from last year; 159*l.* 17*s.* 1*d.* dividends on stock; and subscriptions 305*l.* 7*s.* The disbursements amounted to 460*l.* 18*s.* 5*d.*, including 40*l.* for two pensions; 381*l.* paid to applicants for relief; and 39*l.* 18*s.* 6*d.* paid for working expenses; leaving a balance of 17*l.* 5*s.* 6*d.* to be carried forward.

The Chairman, in moving the adoption of the report and balance-sheet, and the election of a new trustee in the room of the late Mr. Street, emphasised the words of the report as to the necessity of increased support to the Society from the members of the Institute.

Mr. Mocatta, in seconding the motion, said that while he should be very glad to see a much larger number of subscribers, he looked with great satisfaction upon the augmentation which had been made during the last year or two in the funded property of the Society,—an augmentation largely due to the initiative of Mr. Godwin, seconded by the efforts of the late Mr. Thomas Wyatt.

The motion was adopted, and Messrs. James Williams (of H.M. Office of Works), T. M. Rickman, F. W. Porter, Edwin Nash, and Joseph Peacock were elected members of Council in the room of Messrs. Ewan Christian, T. Hayter Lewis, A. W. Blomfield, J. P. St. Aubyn, and W. A. Boulnois. Messrs. Lewis Solomon and William Hudson were elected auditors for the ensuing year.

## WATER POWER IN THE PUNJAB.

The Secretary of State for India in Council invites us to give publicity to the fact that a paper recently published in the *Gazette of India* sets forth the terms on which leases of water-power are now available on the canals in the Punjab.

Raw material in the shape of cotton, wool, hides, hemp, &c., are to be found in abundance in the Punjab; there is also a population sufficient to supply the labour required for factory operations; but the scarcity and dearthness of fuel are such that it is almost impossible to make a manufactory remunerative in any case where steam-power is necessary for its working. Wood costs about Rs. 30 per 100 maunds; coal about Rs. 1.8 per maund at Amritsar, and 14 annas a maund at Delhi; so that the cost of working a 100-horse-power steam-engine would be about Rs. 150 per diem, while a water-wheel of similar power would cost only about Rs. 5 per diem.

The localities where this vast water-power is available are named.

The standard for the calculation of 1-horse-power is assumed at 15 cubic feet per second falling through 1 ft., as 8.8 cubic feet per second falling through 1 ft. constitutes a theoretical horse-power; there is thus ample margin allowed for the effective working of the machines.

The Government are prepared to grant the use of the water for working machinery for periods not exceeding twenty years on the terms shown below:—

Approximate Rates per Horse-power per Annum.

	Rs.
For the first three years .....	Nil.
For the second five years .....	60
For the third six years .....	100
For the fourth six years .....	160

Good results should follow these arrangements.

PREVENTION OF FADING IN SHOP  
WINDOWS.

The Swiss *Gewerbe Blatt* recommends a remedy for an evil which drapers and many other shopkeepers have long experienced, namely, the fading or bleaching of many kinds of coloured articles when exposed in the shop-windows. The authority quoted says that this fading or bleaching is brought about only by the white rays of the sun's light, and where it occurs, it shows that the glass is more or less perfectly colourless. It is found that if, instead of such colourless glass, the window-panes consist of glass which is slightly yellow, the bleaching or fading process is prevented. Where the glass is colourless and cannot be replaced by slightly yellowish tinted glass, the desired effect may, it is said, be produced by simply giving the panes a coating of copal varnish.

**Chimney-pieces and Stoves.**—Messrs. Ashton & Green have just now issued an illustrated price-list, containing a large number of designs for chimney-pieces of moderate cost, some of them coloured to show the varieties of marble employed in their construction. Illustrations and prices of a large number of grates are also given.

## UNDERGROUND ROOMS.

SIR,—Your correspondent, "G. M. D.," evidently fails to recognise the very essential difference between "rooms" occupied by and let separately to different occupiers, and those wholly in one occupation, and I differ with him *à la cetera* in his construction of the Act. My belief is that the Legislature had specially recognised the different mode of treatment, and provided for the same.

He surely would not wish to prevent butlers in Grosvenor-square or Park-lane sleeping in the basements, of which they are the regular custodians and guardians, and multiply useless legislation for no practical end.

The more basements are disfranchised the more the worse evil of overcrowding in upper floors will take place. The problem of the day is how to house the poorer classes, not to render the present small accommodation smaller.

I need hardly say how entirely impracticable it is for district surveyors to perform police duties and see how such rooms are occupied at night. It is one for the local authorities and their sanitary inspectors to deal with.

A DISTRICT SURVEYOR.

## TREATMENT OF BUILDERS.

SIR,—I venture to call your attention to the following facts, feeling sure that your sense of justice will cause you to give publicity to it.

In common with several firms I submitted a tender (in accordance with an advertisement in your paper of the 11th ult.) for a proposed firework factory at Mitcham, under a firm of architects in Parliament-street. At the time arranged (Monday, 20th, three o'clock) tenders were received and opened by the architect from eleven firms, and the result was announced in this way:—

"Gentlemen, the highest is 560*l.*, the lowest 319*l.* I will consult my client, and communicate with the lowest." After a demur on the part of the competitors, the tenders were read, as follow:—

Barnes .....	£560 0 0
Cooke .....	440 0 0
Marsland .....	435 0 0
Ennor .....	425 0 0
Holloway .....	394 0 0
Battley .....	380 0 0
Burch .....	375 0 0
Smith & Bulled .....	375 0 0
Capsay .....	370 0 0
Ta tile & Co. ....	345 0 0
Page .....	319 0 0

On reading the list published by you (p. 240), I find thirteen names, one of which, at 345*l.*, is accepted, but an addition is mentioned of 30*l.* for red bricks, which were never mentioned in the specification. The facts are brief and speak for themselves. But while admitting the perfect right of an architect in a public or private competition to recommend any man for acceptance, the addition of a tender after public opening can only convey one impression to the minds of those who sent in at the right time.

ONE ANNOTED.

## THE INVASION OF ANTS.

SIR,—I have tested the remedy (plaster of Paris and sugar) as recommended by "Watford, Herts.," but I could not get the ants to "make one meal of it." They walked over it with the most sovereign contempt. I have not ventured to try the arsenical mixture, because I fear that my household have not quite such lively instincts as the ants, and a mistake might occur, as is so frequently the case when "there is poison about."

F. S. A.

## VARIORUM.

We spoke not long since of the appearance of a new edition of "The Imperial Dictionary," revised by Chas. Annandale, M.A., and published by Blackie & Son, Old Bailey, &c. We need now simply mention that the second volume has been issued, ranging from "Departure" to "Kytho." We wonder, by the way, how many readers in a hundred know what that word means?—Part 10 of "English Etchings (W. Reeves)" includes a view of the obelisk on the Embankment, with the sphinxes placed not as they are, but as they ought to be. "The Shimmering Sea," in the same number, is worth the cost of the part.—We wish to introduce a novel to our readers: a "A Laodicean; or, the Castle of the Stanzas," by Thos. Hardy; published by Sampson Low & Co. "What next," says Strailace: "I do not look to my *Builder* for notices of novels." Very likely not. But there are novels and novels, and when we find one, as in this case, dealing with the life of an architect and written by an archi-

\* Kythe, v. t. to appear; to be manifest (Old English and Scotch). "It kythes bright."—Sir W. Scott.



ect, it seems quite right that we should give it a word. The whole story grows out of a sketching tour, and is very interesting. It is agreeable to us to find Mr. Hardy speaking of the *Builder* as "the familiar periodical from which, in my days of pupillage, I gained so much that was of use to me in the profession I had then entered upon." Mr. Hardy, it will be remembered, is the author of "Far from the Madding Crowd," in connexion with which he seems to have been used somewhat ungenerously by a contemporary dramatist.

### Miscellaneous.

**The Artisans' Dwellings Act.**—The Committee of the House of Commons appointed to inquire into the operations of the Artisans' Dwellings Act sat at Westminster on Tuesday afternoon, Sir Richard Cross presiding. Sir Henry Hunt, consulting surveyor to Her Majesty's Office of Works, and arbitrator under the Artisans' Dwellings Act of 1875, said he had acted in fifteen cases, eight in the metropolis and seven in the provinces. He considered that the Act had worked most beneficially in the public interest by clearing away unhealthy areas. This had no doubt been done at considerable cost to the ratepayers, but great expense was inevitable in such matters. At the same time, he was of opinion that the machinery of the Act was too cumbersome, too dilatory, and too expensive; and he ventured to suggest a simpler and more summary course of action. He recommended to the Committee the operation of the Post Office Land Act passed last session, which gave the Postmaster-General power to acquire any property by giving three months' notice to the occupiers, application to Parliament being avoided. He gave the Committee information as to the demand that existed for small property, such as that to be found in Petticoat-lane, London. It frequently occurred that as much as £1 was paid by tradesmen to get tenants out of their premises, a sort of tenant-right being thus established.

**Application of Stored-up Power.**—On Saturday afternoon last there was (according to the *Daily News*) a successful demonstration of the application of stored-up power to the propulsion of a tramway-car. The experiment was tried on the line of rails connecting the North Metropolitan Tramway Company's carriage-works with the company's lines. The car was an open one, of Continental make. Enclosed under the seats and behind them, along the sides of the car, was a large number of Faure's improved accumulators, which had been previously charged from a dynamo-machine at the Tramway Company's works. These accumulators were connected with a dynamo-machine underneath the car, the motion of which was communicated to the wheels of the car by a cog-wheel arrangement. Connexion was established and broken by the simple movement of a switch. Thus, with the simplest possible movement, the stored-up force was reconverted from electricity into motive power, and the car moved off at a speed which was easily regulated; for, according to the distance the switch was moved, the driver could run his car with a supply of force from a greater or less number of accumulators at his pleasure. The weight added to the car by the accumulators was a ton and a half. The force said to be stored in them was equivalent to 25-horse-power for one hour, or 1-horse-power for twenty-five hours. It is claimed by Mr. Radcliffe Ward, who was conducting the experiment, that this method of propelling conveyances has an enormous advantage over others in point of economy, while its noiselessness and freedom from the nuisances of smoke or steam are obvious recommendations.

**The Sunday Society.**—Arrangements have been made for holding an evening party in furtherance of this Society, which has for its object to obtain the opening of museums, art galleries, libraries, and gardens on Sundays, similar to those which gave satisfaction in previous years. The party will be held at the Freemasons' Hall, on Wednesday, March 29th, and will, as before, be confined to the members of the Society and their immediate friends. The proceedings will commence with addresses in support of the objects of the Society, under the presidency of Mr. Thomas Burt, M.P., after which musical selections for promenade and dancing will be given by Mr. Dan Godfrey's band.

**The Highest Railway Bridge in the World** is, or will be (of course) in America. On the top of the Alleghany Mountains, at the point where the Bradford extension of the Erie Railway is to pass, is "a slight impediment" in the shape of a ravine 300 ft. deep. The chief engineer of the Erie, Mr. Chanute, has exhibited to a reporter of the *New York Herald* his plans for getting over this impediment. For some time it has delayed a railroad connexion between that section and Pittsburgh. It is virtually a valley, running lengthwise the mountain range, whose walls are 2,200 ft. above the level of the sea, and whose bottom is washed by the waters of the Kinzua Creek. In some places the depth of the valley is 700 ft. and 300 ft. was about the first favourable crossing-point that could be found. Work was begun last fall upon a structure which, when completed, will be the highest railway-bridge in the world. The length of the bridge will be over 2,000 ft., that distance to be covered with twenty-two piers of iron and twenty-three spans. Two low stone piers will underlie each iron one, the total masonry-work amounting to 2,200 cubic yards. The length of the piers will be 40 ft., and the length of the spans 60 ft. The piers will be 110 ft. wide at the base, tapering gradually up to a width of 12 ft. at the top. The firm of Clark, Reeves, & Co., of Phoenixville, Pa., are the contractors for the ironwork. They expect to complete the structure by about June 1st. Its total cost will be about \$300,000. Both Mr. Chanute and Mr. Clark agreed that there was no railway-bridge in the world of so great height as this would be. The Kentucky River Bridge is 276 ft. high, the Great Peruvian Railway-bridge is 235 ft., the Portage Bridge on the Erie's main line is 234 ft., and the Niagara Suspension Bridge is 275 ft.

**Rawtenstall.**—A large five-light window has been fixed this week in St. Mary's Church, Rawtenstall, near Manchester, the gift of Mr. Worwick, of Greenbank, in memory of the late Mr. Henry Ashworth and his sister. The three centre lights are treated as one composition, showing our Lord as the healer. Round our Lord, who occupies the centre light, are grouped the maimed, the lame, the blind, and the sick. At the head of the centre opening, forming part of the canopy, grouped and entwined with it, is a votive angel, bearing a scroll, with the legend: "Blessed are the Dead"; while the pelican tearing its breast to feed its young occupies the base of the centre light, emblematic of Christ dying for the Church. The other two lights are occupied respectively by the subjects of Christ raising from the Dead the Widow's Son at Nain, and Mary sitting at the Feet of Jesus, while He half rebukes Martha for saying: "Mary hath chosen that good part." The window is painted in a rich full key, and is from the studio of Messrs. I. A. Gibbs & Howard, of London.

**The Cathedral Close at Norwich.**—The Dean of Norwich writes to call attention to the fact that the Lynn and Fakenham Railway Company have a Bill now in Parliament awaiting its second reading, the effect of which will be to pass a line of railway through the Cathedral Close at Norwich, cutting off the margin of the Close which is skirted by the river Wensum (and within which margin is embraced a very curious and interesting relic of antiquity), ejecting from their quiet homes several citizens who have retired to the Close for privacy and seclusion, and curtailing one of those few open spaces which are now thought so essential for the health and recreation of the inhabitants of our great towns. Dean Goulburn states that the invasion of a Cathedral Close by a line of railway is a new and hitherto unheard-of thing.

**A New Synagogue.**—On Sunday last the memorial stone of a new synagogue in course of erection in Abbey-street, St. John's Wood, was laid by Mr. Lionel L. Cohen. The synagogue is being erected by Messrs. Kirk & Randall, from the designs of Mr. H. H. Collins. The style of architecture is Italian, with Byzantine feeling. The materials are red brick, with Damfries red stone dressings. The cost, including site, mason's house, &c., will exceed £2,000. The building will accommodate 500 worshippers.

**St. Pancras.**—Provision is being made for an additional outdoor-relief station for this parish in Charles-street, Somers-town, by converting two houses and certain additions. Messrs. Stead's tender has been accepted. Mr. Bridgman is the architect.

**Building Land at Hendon.**—The National Standard Land Society, under the conduct of Mr. Richard J. Collier, held their first sale of freehold building land last month at the Midland Hotel, Hendon. The Midland Railway Company had, just before the sale, purchased twenty-seven lots, which about on their line, leaving fifty-three lots to fall under the hammer out of the eighty advertised. After some preliminary remarks, bidding commenced for lot 1, a freehold corner shop plot, having a frontage to the Edgware-road of 27 ft. 6 in., by return frontage to Gutter's Hedge-lane of 55 ft., which was slowly run up to 900, at which price it was sold. All the lots up to twenty-seven were marked out as shop plots (with the exception of lot 23, which was reserved for a public-house plot). The frontages were generally 20 ft., by depths varying from 87 ft. to 112 ft., and averaged 90 ft. per plot. The public-house plot sold for 2750. The remainder being smaller plots for the erection of residences, had frontages of 17 ft., by depths of from 80 ft. to 90 ft., and were sold at from 450. to 700. per plot. The total sum realised at the sale amounted to 4,002. The amount of the railway company's purchase was 1,800. Previously to the sale commencing, Mr. Collier drew attention to the principle upon which he conducts his sales with regard to the nine years' payments. If before the expiration of the time the principal is paid, interest ceases with the last instalment.

**Dangerous Steps.**—On Wednesday last the Coroner for Central Middlesex held an inquest at the St. Pancras Coroner's Court, as to the death of Edward Goddard, aged 28, a freemason, of 263, Great College-street, Camden Town. On Saturday week the deceased, who was in the employ of Mr. Jennings, on descending some steps from an upper workshop, where there was no handrail, suddenly slipped, and fell to the bottom on his head. He was so seriously injured that his father took him in a cab to University College Hospital, where he received but little attention. Dr. Batt deposed that the death was from concussion of the brain, caused by the fall. It was a proper case for treatment in the hospital. The foreman of the jury said he saw the deceased, and considered it a shameful thing that he was not admitted. In returning a verdict of "Accidental Death," the jury called the attention of the district surveyor to the dangerous state of the steps, and expressed their regret that the deceased was not admitted to the hospital at once. It is by no means certain that the district surveyor would have any power in the matter.

**The Fitz Recreation Ground, Keswick.** A week or two ago we mentioned this project for securing twenty-seven acres of land at Keswick, for use as a public recreation-ground. The success of the project is now assured, thanks to the munificence of the Hewetson family. Messrs. Thomas & Harry Hewetson have each raised their promised subscriptions from 1,000. to 1,700., making a total of 3,400. Mr. John Hewetson gives 1000., and the Misses Jane, Elizabeth, Mary, Hannah, and Emma Hewetson 1000. each, making a grand total of 4,000. This liberality will render the execution of the project a light matter, financially, to the local residents.

**Builder's Claim.**—In a reference as to a mansion for the Rev. T. L. Griffith, at Pen-y-mant, by contract, schedule of prices, and day-work, the umpire, Mr. Banister Fletcher, held his final sitting at Westminster Palace Hotel on Saturday last. The total claim is 17,564 11s. 10d., and the plaintiff claims a balance of 3,504 17s., while the defendant's contention is that the plaintiff is overpaid to the value of 288 12s. 6d. The counsel engaged were Mr. T. H. Wheeler and Mr. A. Yates; the plaintiff's London solicitors being Messrs. Smith, Fawcett, & Low, and the defendant's London solicitors being Messrs. Prior, Bigg, Church, and Adams.

**Knapton.**—Mr. G. Gilbert Scott has made a report on the condition of the fine old church at Knapton, Norwich, which is sadly in need of substantial repairs, daylight being visible through the roof in several places. A restoration committee has been formed, and among other improvements will be the substitution of open benches for the present ugly pews. The roof is a fine example of the double hammer-beam construction, and retains great part of its original coloured decoration.

**Kidderminster School Board.**—Out of eight designs submitted in competition for Leas- street schools, the Board at the last meeting selected the design by Mr. J. M. Gething, architect, Kidderminster and Stourbridge.



**Safety in Theatres.**—At Hooley's Theatre, in Chicago, an experiment was made the other day to determine the efficacy of ventilators over the stage for keeping the flames of a conflagration behind the proscenium arch from issuing into the auditorium. The *American Architect* says,—In the presence of several fire engineers, members of city committees and others, half a dozen stoves, filled with rags dipped in turpentine, wet shavings, and other combustibles, were lighted, and allowed to burn for several minutes. When the stage was well filled with smoke, a ventilator, formed by a round shaft, 8 ft. in diameter, and carried up 20 ft. above the roof, was opened by pulling the wire-rope which controlled a valve in it, and in less than a minute the smoke was completely cleared away. The curtain separating the stage from the auditorium was partly lowered during the trial, which certainly affords evidence of the value of such an arrangement in protecting the audience in case of a fire on the stage. To give assurance of effective operations in case of actual need, the experiment ought, however, to be repeated while the gas is lighted all through the house, and the regular ventilating-apparatus of that portion in full operation. With anything like the thorough ventilation now usual in the best theatres, the upward draught from the space in front of the curtain would during a performance be very powerful, enough so, perhaps, to counteract, or even reverse, the current through the stage-ventilator. This would, if once ascertained, be easily remedied; perhaps by the device suggested some time ago, of having the air-currents from all parts of the house drawn toward the stage, to issue together from the ventilator over it.

**A Roman Villa.**—A paper by Mr. Cecil Brent, F.S.A., was read on the 1st inst. at the British Archaeological Association, the Rev. St. M. Mayhew presiding, upon a "Roman Villa, recently discovered at Methwold, near Brandon, Norfolk," at a spot known as Little Holmes, and sketches were exhibited of specimens of the tiles, which are very numerous, and of fragments of an amphora, together with the plan of the parish, with the site of the excavations marked upon it. The parish preserves a great deal of the old Roman nomenclature. It lies near the Roman roadway, but outside the Roman line of demarcation, a fact which gives some interest to the discovery of Roman remains on this site. It is also worthy of note that a spot rising only about 4 ft. above the fen level should have been chosen at that early date for a residence. This ancient building was placed in a corner, formed by the confluence of the String dyke and Haggard's dyke. For years large numbers of tiles have been turned up on the mound of which the Little Holmes is composed, the level of the pavement of the Roman house lying within reach of the ploughshare. The foundations are placed immediately on the subsoil of sand, and are of great hardness and solidity, built in alternate bands of flint rubble and the grey fine-grained Northamptonshire flag-stone. One chamber is apparently an apodyterium; it has a floor of solid masonry, intersected by flues 15 in. wide.

**Extension of Ironworks in South Staffordshire.**—Four years ago Mr. John Lysaght, proprietor of the St. Vincent's Galvanised Ironworks, Bristol, purchased the Swan Garden portion of the ironworks at Wolverhampton, carried on for many years by the late firm of G. B. Thorneycroft & Co. After putting the same in repair, and making very considerable alterations and additions, they were started for the purpose of supplying the works at Bristol with sheet-iron of a superior quality and finish. There resulted such an increase in the demand for the "Orb" galvanised sheets, that it became necessary, in order to meet that demand, to increase the number of sheet mills from seven to eleven. For this purpose additional new plant has been put down during the last nine months, and has recently been most successfully started to work.

**Portsmouth Drainage Competition.**—Objections raised us against the permission given by the Corporation of Portsmouth to their own surveyor to compete, on the ground that he must be in possession of information and advantages not possessed by outsiders. It is said, and it seems to us with justice, if the Corporation have full confidence in their surveyor, let him be entrusted with the preparation of the scheme; but it is not fair, merely to assure themselves that he is a competent man, to induce a number of independent engineers to waste time, thought, and money, for that purpose.

**Books.**—In the interest of our younger readers we point out that a portion of the library of the late Mr. William Burgess, A.R.A., will be sold by Messrs. Puttick & Simpson at their rooms in Leicester-square, on Monday, the 20th. The books are such as every architect needs.

## TENDERS

For road and sewers on the South Aston Estate of the National Liberal Land Company:—  
Ambrose Oliver, Brighton.....£743 0 0  
James Bloomfield, Tottenham.....625 0 0  
Dyer & Hunsley, Loughborough Junction.....515 0 0  
William Harris, Camberwell.....500 0 0  
Philip Giles Pound, Epsom.....490 0 0  
Matthew William Bowles, Aston.....495 0 0  
George Impey, Leytonstone.....490 10 0  
William Herbert Wheeler, Hammer-smith.....478 10 0  
W. Carter, Ashtley.....470 0 0  
James Pizze, Hornsey.....460 0 0  
William Nicholls, Woodgreen.....431 0 0  
John E. Baxter, Waltham-green.....410 0 0  
William Armstrong, Chiswick.....410 0 0  
Cornelius Lyons, Wandsworth.....390 15 0  
\* Accepted subject to references being satisfactory.

For sewer, draining, and forming Cross-street, Back Bolton-road, Back Graville, Back Fereday, and Back Whitehead streets, Walsden District. Quantities supplied by the engineer, Mr. John Price:—  
J. Unsworth, Walsden.....£274 3 7  
J. Jackson, Walkden.....288 3 0  
J. Oaks, Kearsley.....287 17 1  
Charles Harris, Harewood.....268 18 2  
G. Unsworth, Moss Side.....252 10 3  
Snape & Sons, Eccles.....243 6 1  
Wm. Hardy, Altrincham.....237 19 0  
Tanner & Sons, Wreckham.....234 6 8  
Edmund Bird, Chorlton (accepted).....197 13 9

For alterations and repairs to the premises, 141, High street, Hounslow, for Mr. A. Platt. Mr. T. W. Barry, architect:—  
G. Daniels.....£2970 0 0  
J. Windred.....965 0 0  
W. Hogbin.....950 0 0  
J. Osborne.....850 0 0  
W. Wisdom (accepted).....775 0 0

For building two houses on Stepany-green, for Mrs. Gretton. Mr. Mitchell, architect:—  
Higgs.....£1,930 0 0  
Hice.....1,761 0 0  
Young & Fraser.....1,708 0 0  
Lewell.....1,630 0 0  
Judd.....1,643 0 0

For new billiard-room, conservatory, and greenhouses at Hamilton House, Southampton, for Mr. Leon Emanuel. Mr. Arthur Martin, architect:—  
Watts (accepted).....£1,585 10 0

**Hot-Water Fittings.**  
Milson (accepted).....302 14 0

For rebuilding premises, 17, High-street, Dorking, for Mr. Henry Cole. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—  
S. J. Pledge, Holmwood.....£1,037 11 0  
H. Batchelet, Betchworth.....850 13 0  
Hamblin Bros., Dorking.....906 0 0  
C. G. Hesgrave, Dorking (too late).....893 0 0  
Goldard & Sons, Farnham.....890 0 0  
Lynn & Dudley, Dorking.....875 0 0  
W. Edser, Dorking.....840 0 0  
Jas. Clear, jun., Dorking (accepted).....821 18 0

For sundry painters' work to property, Railway Esplanade, Guildford. Messrs. Peak, Lunn, & Peak, surveyors:—  
S. Jolley & Son, Guildford.....£133 15 0  
R. Nye, Guildford.....135 0 0  
H. Edmead & Son, Guildford.....105 0 0  
A. Hallett, Guildford.....88 10 0  
J. K. Miller, Guildford (accepted).....57 10 0

For reconstructing portion of 89, High-street, Guildford, for Mr. G. Oliver. Messrs. Peak, Lunn, & Peak, architects:—  
T. Swayne, Guildford.....£330 0 0  
W. Billmore, Guildford.....315 0 0  
T. B. Downes, Guildford (accepted).....266 10 0

For new staircase, water-closet, &c., 12, St. Catherine's-terrace, Guildford. Messrs. Peak, Lunn, & Peak, architects:—  
N. W. Moon, Guildford.....£158 0 0  
R. Nye, Guildford.....150 0 0  
Smith & Sons, Guildford (accepted).....140 0 0

For house at Wokingham, for Mr. Bartle G. Goldamid. Mr. R. Norman Shaw, R.A., architect. Messrs. Franklin & Andrews, surveyors:—  
Perry & Co. (accepted).....£7,788 0 0  
Kimberley.....7,728 0 0  
Botterill.....7,667 0 0  
Martin, Wells, & Co. ....7,563 0 0  
Brans.....7,558 0 0  
Lawrence.....7,345 0 0  
R. Conder.....7,160 0 0

For new Board Schools, Shillington-street, Lambeth division, for the London School Board. Mr. E. R. Robson, architect. Quantities by Mr. T. Thornton Green:—  
J. Oliver.....£13,474 0 0  
J. Marsland.....13,304 0 0  
Wm. Brass.....13,000 0 0  
W. J. Luke & Son.....12,994 0 0  
Perry & Co. ....12,994 0 0  
Higgs & Hill.....12,784 0 0  
Kirk & Randall.....12,463 0 0  
W. Bennett & Co. ....12,453 0 0  
Wall Bros. ....12,290 0 0  
R. B. Nightingale.....12,134 0 0  
W. Oldrey.....12,101 0 0

For rebuilding Sun and Thirteen Cantons public-house Great Putney-street, W. Mr. Cotton, architect. Quantities supplied:—  
Patrick & Son.....£2,795 0 0  
McLauchlan & Sons.....2,779 0 0  
Williams & Sons.....2,645 0 0  
Foxley.....2,599 0 0  
Patman & Co. ....2,573 0 0  
Stimpson & Co. ....2,433 0 0  
Langmead & Way.....2,173 0 0

For enlargement of schools, Neckinger-road, Bermondsey, for School Board for London. Mr. E. R. Robson, architect:—  
W. Scrivener & Co. ....£5,494 0 0  
Steel Bros. ....5,472 6 8  
Kirk & Randall.....5,237 0 0  
S. J. Jarrard.....5,175 0 0  
W. Shurmar.....4,977 0 0  
W. Shepherd.....4,939 11 0

For red granite (delivered only) for the piers of the Dome addition to the Stock Exchange. Mr. J. J. Cole, architect:—  
*In Ross of Mull.*  
Feenling.....£12,092 0 0

*In Corranrie.*  
Fyfe.....12,240 0 0  
Nicholson.....12,240 0 0

*In Peterhead.*  
Wright & Sons.....13,228 0 0  
Bower & Florence.....13,230 0 0  
Macdonald, Field, & Co. ....12,515 0 0  
Fraser & Son (accepted).....10,500 0 0

For the erection of farm buildings at Chesham, for Capt. John Hubert Tate. Mr. Marshall N. Iman, architect:—  
Park Farm, Chesham Hall Farm, Chesham.....£405 0 0  
Taylor.....439 0 0  
Humphries.....£1,190 0 0  
Bassett.....1,348 0 0  
Lawrence.....1,123 13 0  
Keal.....1,123 0 0  
350 0 0

For road and drainage works on the United Land Company's Harrow-road Estate, Kanak-green:—  
W. Nicholls.....£7,074 0 0  
J. Simmons.....7,735 7 8  
W. J. Botterill.....6,727 0 0  
Nowell & Robson.....6,385 0 0  
J. Jackson.....6,333 0 0  
Ford & Everett.....6,000 0 0  
Rowland Bros. ....5,995 0 0  
J. W. Simpson.....5,926 0 0  
C. Killungback.....5,845 0 0  
A. F. James.....5,762 0 0  
F. & W. Holt.....5,647 0 0  
Neave & Son.....5,640 0 0  
J. Stockwell.....5,565 0 0  
J. Cardus.....5,465 0 0  
Conrad & Lewis.....5,403 0 0  
J. Pizze.....5,300 0 0  
M. W. Howies.....5,192 0 0  
Wilkes & Co. ....5,184 0 0  
C. Taylor.....5,050 0 0  
G. Felton (accepted).....4,968 0 0

For formation of road, footpaths, and sewer, at Neasdon, Middlesex, for the Metropolitan Railway Company. Mr. Walter Graves, surveyor. Quantities by Mr. H. E. Pollard:—  
W. Crockett.....£2,858 0 0  
F. W. Keable.....2,600 0 0  
Nowell & Robson.....2,400 0 0  
W. J. Botterill.....2,386 0 0  
G. Felton.....2,199 0 0  
A. Oliver.....2,098 0 0  
Mowlem & Co. ....1,890 0 0  
Wall Bros. ....1,849 0 0  
C. Killungback (accepted).....1,590 0 0

For the erection of four shops at Kilburn, for Mr. R. Rose. Mr. Walter Graves, architect. Quantities by Mr. H. E. Pollard:—  
Ward & Lambie (accepted).....£3,300 0 0

For alterations to Manor House, Gunnersbury-lane, for Mr. J. Howard Walker. Mr. Walter Graves, architect:—  
Edmann.....£1,143 0 0  
Penny & Durrant.....130 0 0  
Nye & Son.....121 0 0

For alterations to No. 18, Vicarage-gardens, Kensington, for Mr. J. Hanson Walker. Mr. Walter Graves, architect:—  
Joseph Meers.....£2310 0 0

For cricket pavilion in Lytham, Lancashire. Messrs. Myres, Voevers, & Myres, architects. Quantities supplied by architect:—  
Henry Ward.....£239 8 4  
John Walmsley.....358 8 8  
T. Myresough.....349 0 0  
E. Wilson.....254 16 8

For alterations and additions to Warwick House, and No. 12, High-street, Clapham, for Mr. W. Edwards. Mr. J. William Stevens, architect:—  
Pack.....£2,381 0 0  
Oxford (accepted).....303 0 0

For remodelling, after fire, 139, Cannon-street-road, St. George's-in-the-East. Mr. Geo. Legg, architect:—  
W. Shurmar (accepted).

For alterations, B. de Bella's restaurant, 119, Holborn:—  
F. P. Treweaks & Co. (accepted).....£200 0 0

For alterations, Continental Café Restaurant, 7, Wilton-road, Victoria Station, for Messrs. Monico, Rampazzi, & Co. Mr. F. A. Doucey, architect:—  
F. E. Treweaks & Co. (accepted).....£700 0 0

For new road (called Crescent-road) and sewers at Finchley, for Messrs. Dence & Mason. Messrs. E. E. Crouch & Co., surveyors:—  
McKenzie, Williams, & Co. ....£780 0 0  
T. G. Dunmore.....607 9 0  
J. Bell (accepted).....530 0 0







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### Antiquities of Cyprus.



OMINATED as it was, successively, by all the prominent and powerful nations of the old world, Greek, Assyrian, Egyptian, Phœnician, Roman, and Italian, the Island of Cyprus, it is easy to consider, would assume from time to time various phases of national and domestic life; and, by an equally easy induction, the traces of these successive waves

of progress would not be difficult to discover, if only investigation were carried out scientifically and persistently enough. That the island was, indeed, full of valuable antiquities was no new fact to our nineteenth-century explorers. Florio Bustron, who wrote the "History of Cyprus" in the seventeenth century,—his manuscript is now preserved in the British Museum Library,—states that in the diggings at Constanza, a town which rose upon the ruins of Salamis, there were found during his time many medals in gold, silver, and copper, rings, earrings, necklaces, bracelets of gold and silver, and other ancient monuments in terra cotta and stone. Subsequent excavations verify all this, but it is remarkable that from Bustron's time until less than twenty years ago, no enterprising antiquary had taken the pains to conduct any investigation of sites that were afterwards to prove so fertile in the monuments and jewelry of the ancient races of the island. Now, however, there are few museums,—indeed, few private collections of antiquities of any pretension and magnitude,—which do not include specimens, some of considerable merit and value, that have been disinterred from the buried cities of the Cypriote littoral. But for the purpose we have in view on this occasion we shall limit our notice to the three great collections of antiquities which have been gathered together, and now attract the admiration of the world of archaeologists and antiquaries. These are,—1. The British Museum Collection; 2. That of General L. P. di Cesnola; and 3. That of Major Palma di Cesnola, better known as the "Lawrence-Cesnola" Collection. The aggregate of these three large gatherings in all probability represents all that we are ever likely to recover from subterranean cemeteries and earth-covered sites of ruined cities and resorts along the island shore; for although some veteran archaeologists believe that under judicious investigation sites even richer than those yet explored are

to be uncovered, nevertheless the attempt to reclaim any great quantity of these relics has met with disappointment. Thus we may take it for granted that the known relics are fairly indicative of what will hereafter come to light.

1. The British Museum collection, although not large, is representative of the various periods and styles. It has been acquired chiefly by the labours of Mr. R. H. Lang, late H. M. Consul at Cyprus. Some of the objects were purchased for the Trustees from General L. P. di Cesnola; some were presented by the late Mr. Christie, the well-known archaeologist; and others have been obtained individually by that process of gravitation or tendency to centralisation which all famous institutions possess as an inherent factor in their life and progress. At the present time no catalogue of these Cypriote relics, which are incorporated into our national collection, is extant. The relics themselves are scattered over the Museum, some on the ground-floor at the entrance to the Egyptian gallery and Assyrian corridors, in the charge of Dr. Birch, keeper of the Egyptian and Oriental antiquities; others, in the charge of Professor Newton, keeper of the Greek and Roman antiquities, in the upright wall cases in the old Egyptian rooms on the upper floor; and the smaller objects, such as glass, gold, silver, bronzes, and so forth, are in other parts of the building. These antiquities consist of several large cases of stone figures, some full length and fairly perfect, while of others only the heads remain. These have been arranged by Dr. Birch in chronological periods of Archaic Greek, Later Greek, and Phœnicio-Egyptian. Near these cases is a fine stone carving, representing the upper part of a draped statue of a deity, with a wreath on the brows, discovered by Consul Lang at Dali, the site of the ancient Idalion, which gives the well-known epithet to the goddess of love, who was especially venerated in, and, if we may believe the legends of the past, especially in her turn watched over and protected, the island. Another head, in the Egyptian style, and a male head of considerable merit, also in the Egyptian style, discovered by Mr. Lang, face the visitor as he walks up the gallery. In one of the cases on the right-hand side at the entrance of the gallery are deposited a number of terra-cotta figures, either toys or votive offerings, in the form of chariots, goddesses, and animals, which Cyprus has yielded so abundantly, and which may be compared with almost identically similar objects found by Dr. Schliemann in more than one of his remarkable excavations. Among the miscellaneous remains, not to mention the archaic pottery, a part of a silver spoon with an inscription upon it, and several slabs with Cypriote inscriptions, are worthy of notice. Above all, in importance, must be reckoned the stone with a bilingual inscription, Cypriote and Phœnician, by means of which Dr. Birch and the late Mr. George Smith discovered the Cypriote language to be of Greek form. A

catalogue of the Cypriote antiquities in the British Museum, irrespective of the places of their preservation and deposit, would be especially welcome to antiquaries who have before them the works of the two brothers Di Cesnola.

2. The collections now arranged and exhibited in the New York Metropolitan Museum of Art, where they are under the directorship of their discoverer, were acquired by General Louis Palma di Cesnola, an Italian nobleman, a soldier of the Italian Revolution of 1848 and 1849, and of the American Civil War. In 1865 he was appointed American Consul to Cyprus. Hardly had he settled down to his official work at Larnaca, when he became impressed by the idea that Cyprus was the great central meeting point of the ancient races, and that the Greek settlements there in the heroic period must have derived from Phœnicia and Egypt the old Eastern civilisation. The General was not long in finding Larnaca,—the site of Citium or Kittium,—to be true to the signification of its name, the "place of the tombs." During the winter of the year 1865-66 he opened several hundred tombs in its vicinity, and conducted excavations at the Salines, the ancient fort of the city. These two sites, Larnaca and the Salines, proved rich beyond expectation in terra cotta, statuettes, and glass antiquities. In the following year, 1866, General di Cesnola visited the sites of Golgoi and Idalion, and there began his most remarkable disinterment of treasures from no less than fifteen thousand tombs; and in this work he continued, working at favourable opportunities, for ten years. These treasures consist, for the most part, of coins, glass, statues, inscribed stones, bassi rilievi, bronzes, gold and silver jewelry, engraved gems, statuettes, terra-cotta vases, and lamps. Here were found the earliest fictile works of Phœnician art, the finest collection of Greek glass then extant, and some of the oldest painted and decorated vases and stollia which the modern world had then seen. It is an impressive fact, says the General, in the "Historical Notice" prefixed to his projected "Descriptive and Pictorial Atlas" of Cypriote Antiquities, that to the custom of securely burying with the dead favoured objects of the fine and industrial art, whether inscribed or uninscribed, we owe much of what we know of the social and national life and history of ancient nations. The various tombs of Cyprus are sepulchres of the ages; Cyprus is in itself a series of cemeteries, forming one vast necropolis that unfolds to us the history of ancient civilisation. The Greek graves and tombs, which he explored on the hill slope of Idalion, were struck at a depth of 3 ft. below the surface; 2 ft. 6 in. below these were the Phœnician tombs. These latter were constructed in a remarkable manner. Commencing at the foot of the hill, a square excavation was made into the bank from the east, then a further excavation of an oven-



shaped chamber, which was prepared by plastering it with earth. These tombs were intended for the sepulchre of one or three persons; if for one, a platform was constructed on the western side, raised a few inches above the ground of the tomb, and upon it the body was laid facing to the east. When three occupants were to share the tomb this raised platform extended on each of the three sides away from the entrance, and the bodies lying on the north and south sides were placed with their heads to the east. In almost every instance the tombs rewarded the searchers with some works of art and utility. Those tombs that had received their complement of the dead were closed with a large stone slab; the sepulchral inscriptions upon them being in many cases preserved by the explorer. Sometimes a bas-relief adorned with ionic figures closed the entrance, and judging from the specimens which are preserved, these form a most remarkable feature of the collection. The tombs on being opened indicated that the rain of ages had penetrated through to them, conveying disintegrated soil, which in most cases completely filled them. Hence the prosecution of these researches, so extensively planned, with unskilful native assistance only, and with tools and appliances inadequate to the task, taxed the patience and ingenuity of Di Cesnola. At first, we are told, there was necessarily some breakage, but soon the workmen were restricted to the use of their hands, a knife, and a basket, and thus with care everything was saved intact. A common pick or hoe, a rude wooden shovel, and a few levers of wood and iron were the only implements used during the excavations. It is curious to note that the General accounts for the superposition of the Greek cemetery upon the Phœnician tombs by the fact that Phœnician Idalion was destroyed in the ninth century B.C., and the debris of the structures near the top of the necropolis, and even a portion of the hill itself, were carried by the wear of centuries of atmospheric action down the slope, so completely covering the tombs that in after times the Greeks were unaware that their necropolis reposed upon another and an older city of the dead.

In the winter of 1869-70 the indefatigable General again turned his attention to Cyprus. This time he was attracted to Golgoi, of which town the temple had been the object of much fruitless research. In spite of difficulties, chiefly caused by the unreliability of historical data, tradition, original names, and of surface ruins, the site was defined, and in March, 1870, the excavator was again rewarded by the discovery of the site of the historic temple. This edifice had hitherto been sought upon an acropolis, as a Greek structure, but in reality it was found to stand among the extinct groves and limpid fountains of the valley, clustered round about with tombs, the foundations being no less than 6 ft. 6 in. below the surface. This was a fruitful year to the explorer; for during 1870 he visited and surveyed the sites of Paphos, Soli, Ormidia, Aphrodisium, Karpas, Salamis, Poli, and Amathus. Three years afterwards, after a visit to America, Cyprus was again visited; and, in 1873, the exploration of the site of Curium resulted in the magnificent discovery of a collection of gold, silver, and engraved gems of such extraordinary richness that the antiquities from this place alone may be truly called a museum in itself. In 1877, General di Cesnola, then in London, having unsuccessfully endeavoured to dispose of his treasures to the British Museum, for reasons which it is now fruitless to detail, brought out his work, entitled "Cyprus: its Ancient Cities, Tombs, and Temples." This work passed through three editions, the third being issued in the following year by Harper & Brothers, of New York, to which city the collection was removed, and the scientific display of these relics now adorns the Metropolitan Museum of Art there. Although all Englishmen are ready to deplore the fact that no patriotic antiquary stepped forward at the right moment to secure the location of this marvellous collection in England when the course of events proved adverse to the acquisition of them for the British Museum, yet no one will, we feel sure, grudge the Americans the possession of such an unrivalled collection of Cypriote art-treasures.

We do not propose to criticise the work mentioned above: written in a clear and lucid style, adorned with a vast number of woodcuts executed by masterly hands, such as those who are familiar with the best American style of illustration will readily call to mind, a careful perusal of this

work, which is really a masterly production in a literary as well as an archaeological sense, leaves the reader fairly astonished with the multiplicity of relics, the variety of styles of art, the immense range of centuries, and waves of feeling which must have come and gone over the

"Iovela lela choris, blandum et mater amorum."

General di Cesnola's collection consists of the spoils of Citium, which are terra-cotta vases in a multiplicity of elegant forms, figurines or statuettes in different stages of fineness, many being ionic, and some grotesque, sarcophagi, sepulchral cippi with inscriptions, alabaster vases, and terra-cotta masks, which may be compared with the Etruscan masks which we mentioned in our recent notice of the new Etruscan-room in the British Museum; and the relics of Dali or Idalion, formerly excavated by the Comte de Vogüé in 1862, and by Consul Lang at a later date. These comprise double-handled vases of great capacity, vases with Phœnician inscriptions burnt in on the clay, gold amulets, earrings, finger-rings, and caracans, pottery of the whole circle of Greek conventional contours, glass vessels of the style called Phœnician, tumbler-shaped with gouttes, striated, banded, and marbled in the style which closely resembles the marbling on the edges of a modern book; terra-cotta lamps of the Roman period, and bronze bowls or saucers engraved with representations of sacred ceremonies or the divine cult of the deities who found favour with the inhabitants. From Alambra, by the same explorer, many copper spear-heads and weapons were procured; from Dali a large number of vases in forms of animals, zoomorphic reproductions in clay adapted to domestic and religious uses as libation bowls, tetines, and unguentaria; the varieties of these cannot here be put on record. Golgoi yielded, among numerous other things, a sarcophagus sculptured with a boar hunt and a symposial scene, a silver patera in the Egyptian style adorned with engravings of the papyrus flower, and the sacred boat so commonly found in Egyptian works of antique art; Assyrian statues of considerable dimensions worked in the creamy-white calcareous stone, which appears, with few exceptions, to have formed the vehicle of the ancient Cypriote statuary and mason; colossal heads; figures of Venus, Cybele, Hercules, and other divinities; and a rich and varied gathering of archaeological relics. From Amathus the General recovered a very fine stone sarcophagus sculptured with chariot scenes and Greek foliage; alabaster vases; and bossed shields, with combats between lions and bulls, with a guilloché bordering. But perhaps the ancient site of Curium yielded into his hands the most abundant hygean harvest of all, for it would be, indeed, difficult to say what branch of archaeology is not represented by the *trouvaille*. Mosaic pavements of elegant contrast and charming proportion of design; the golden armlets of Eleander, king of Paphos, whose name occurs under the form of Ithaunder in the list of Cypriote kings who brought tribute to the Assyrian monarch Esarhaddon, B.C. 672; agate sceptres; gold rings formed like the twisted screw of a cork-screw; armlets; bracelets; gold rings carved with the heads of griffins and chimæras; scarabs of Egyptian and Phœnician workmanship; goldsmith's work of that fine flaggree and granular style with which visitors to the gold-room of the British Museum are not unfamiliar, although these latter come from Etrurian and Latian sites; these latter come from Etrurian and Latian sites; silver jugs and vessels; gold and silver pateras; necklaces, with pendants in form of the head of Medusa, the sphinx, the lotus, or the pomegranate; a rock-crystal vase fitted with a golden stopper; models of chariots with two and four horses; bronze tripods and candelabra, jugs, feet and handles and ornaments of bowls and scarific vessels, and a few marbles. The General's book has its value enhanced by a treatise on the rings and gems of the treasure of Curium, by Mr. C. W. King, whose works on gems have been so well appreciated by English lovers of what is beautiful in ancient glyptic art; and by a monograph on the pottery of Cyprus, by Mr. A. S. Murray, of the British Museum; as well as by an appendix of 105 Greek inscriptions, sixty-two in the Cypriote language, forming a valuable addition to the somewhat meagre corpus of this remarkable language; and thirty Phœnician inscriptions, chiefly from the excavations on the site of a ruined temple at Citium.

To sum up, the General claims to have explored and identified the ancient and royal cities of Amathus, Corynia, Citium, Golgoe or Golgoi,

Lapethus, Salamis, and Paphos; to have discovered the ruins of Ammochostos or Famagosta, Aphrodisium, Carpassis, Curium, Cythara, Marion, Soli, and Tamassus, royal cities of Strabo and Cl. Ptolemy; and to have examined the sites of Arainos, Audimo, Catalina, Cari, Larnaca, Pergamos, Throni, Tremitis, and several other ancient towns of the geographers. Fifteen ancient temples dedicated to Artemis, Bas, Venus, Cybele, Apollo, or Hercules; sixty necropolises, with a grand total of 60,932 tombs and six ancient aqueducts, are a pretty fair share of archaeological practice to fall to any man; and these yielded, among other things, 2,310 coins, and upwards of 14,000 vases, 2,110 statues, 4,200 busts, 138 cippi, 270 bassi rilievi, 4 sculptured sarcophagi, 1,090 engraved gems and scarabs, 3,719 glass vases and bottles, 1,599 gold bracelets and other objects, 370 silver, 2,107 copper and bronze antiquities, and 2,300 terra-cotta lamps, the total amounting to upwards of 35,000 antiquities. It is but just to the General to record the fact that it was owing to his determination not only to keep the collections in one body under his own name, but also, if possible, to secure them for his adopted country—the United States,—that the trustees of the New York Museum were successful in their efforts to secure them. Had the General been less resolute on these points, or more mercenary, the collections would have been disintegrated, and the articles sold separately, to his pecuniary benefit, but to the incalculable loss of science.

3. But if the collection of General di Cesnola is no longer an available wherewithal for English students to study the phases of Cypriote art, happily there is yet another collection almost equal to it in numerical amount, and quite as valuable in regard to the variety of forms and substances, and in respect to the period of time which it covers and illustrates. This is the "Lawrence-Cesnola" Collection, consisting of objects of antiquity derived from ancient sites in the island of Cyprus which were excavated by Major Alexander Palma di Cesnola, during the years 1876–1879, the funds necessary for the work being in the main contributed by Mr. Edwin Lawrence, F.S.A. This collection is entirely distinct from that in the New York Museum already described, which it so nearly resembles; Major A. P. di Cesnola, brother of the General, and his companion in many labours in Cyprus, remained in the island after the departure of that illustrious explorer, and succeeded in unearthing a prodigious number of relics of various materials and nationalities, the outcome of different ages, the exponents of widely dissimilar artistic modes. These antiquities are now in London, at Holland Park, and, although not for sale, our readers who are interested in them will be glad to know that they may be seen by archaeologists on application to the Major at Palma Villa, Woodchurch-road, West Hampstead. Two publications are destined to manifest the contents of this series: the first, entitled "Cyprus Antiquities excavated by Major A. P. di Cesnola, 1876 to 1879," is an album of large oblong folio size, containing, with accompanying letterpress, sixty plates of silver process photographs, in which are comprised illustrations of several thousand objects, statues in terra cotta, bronze, and stone, glass and terra-cotta vessels, bronze and iron implements and arms, ornaments in gold and silver, gems and precious stones, and a series of the many ancient currencies. Most of these, also, come from the tombs; but numerous sculptured statuettes and bassi rilievi were found among the ruins of the temples, or in walled enclosures into which they were cast, after being broken, in obedience to an edict promulgated by Constantine the Great, by converts to Christianity. In these square enclosures the broken statues lay in heaps; at Kurium, for example, not far from the Temple of Apollo, a heap was found where the heads were in the lowest layer, the bodies in the middle, and the feet over all, at about a yard beneath the surface. Again, in some ruins believed by Major di Cesnola to be the city of Throni, an enclosure 40 ft. square was discovered, containing, as he narrates, parts of more than a thousand statuettes in terra cotta, representing priestesses bearing offerings, beautifully decorated, and with crowned or turbaned heads. With incredible labour, about 200 figures were entirely reconstructed, ranging in height from 3 ft. It would be impossible to give a mere list of the varieties of objects, but among the most curious figured in the "Album" are thin plates of gold foil pricked and embossed



in elegant patterns, and employed to cover the features of the dead, some of these being intended for the mouth, others for the eyes, chaplets for the forehead, and so forth; earrings of filigree and gold wire set with pearls, rubies, pastes, mosaics, and precious stones; necklaces with phallic emblems of a most pronounced character, and undoubtedly worn openly by the richer class of females; gem rings, silver and leaden toys and ornaments, bronze strigils, mirrors, iron weapons, bone and ivory boxes and pins for the hair, inscribed cylinders of hematite, jasper and steatite, scarabei, cones for seals, Phœnician and iridescent glass vessels, some moulded, with inscriptions, others painted exquisitely by hand; unguentaria, bowls, paterae, large sepulchral or cinerary urns of great size, adorned with geometrical patterns and simple archaic forms of animals, men, and trees; amphoræ, alabastra, sepulchral and votive inscriptions in the Greek, Cypriote, and Phœnician languages; an infinity of clay dolls, ranging from the earliest Phœnician period down to the establishment of decadent Greek fashions; cylindrical vessels with holes pierced in the side and a loop handle on the top, serving to hold lighted charcoal for warming the hands; terra-cotta horsemen, chariots and charioteers, tetines, rudely-shaped figures or toys of Venus, gods and goddesses, pigs, geese, cocks, horses, and other animals; pearl shells with inscriptions upon them, thin rolls of lead with inscriptions in the languages already mentioned; masks, busts, lamps, and stone heads and statues. This pictorial work, just published, will be supplemented at Easter by "Salamina: its History, Treasure, and Antiquities," by the same author, in which is given a systematic description of upwards of 14,000 relics of the kind already referred to, from Kitium, Laraka, Timpos, Throni, Korium, Dali, Soli, Golgos, and, above all, from Salamina, the ancient Salamis of Tœner, which has yielded a large proportion of the treasures in this collection. In the preparation of the text of his work describing "things of Salamis," or *Salamina*, several archaeologists of reputation have assisted the author, among them Dr. Birch, Professor Sayce, and M. Pierides, of Cyprus, whose own collection of antiquities is considerable and important. Copiously illustrated as it is with selections from every class of the remains, and amounting to nearly 800 figures or woodcuts, recording new and hitherto unpublished inscriptions in the four languages which successively flourished in the island; and submitting new types to the inspection and consideration of the comparative antiquary, the work of Major di Cesnola will hardly fail to be found of special interest, particularly at the present time, when the public mind is so keenly alive to the importance of Cypriote antiquities.

#### THE ELECTRIC EXHIBITION AT THE CRYSTAL PALACE.

It is curious to observe the special physiognomy of the Electric Exhibition, as contrasted with that of the Smoke Abating Appliances at South Kensington. At Sydenham, indeed, a double attraction is offered. While science may be pursued by day-light, it is when the shadows of evening close in that the visible attraction of the brilliant lights has most charm for those who care more for amusement than for instruction. Nothing, as a general rule, is more attractive to an urban public than brilliant illumination. And when novelty and curiosity are added to the attraction of splendour, there is little room left for surprise at the fact (as stated by the officers of the establishment) that the numbers of visitors now drawn to the Palace are almost without precedent.

The number of young people who frequent the morning exhibition at Sydenham is remarkable. And they come, for the most part, evidently as learners,—asking for explanations of the various novel forms of apparatus which are of such recent birth. In fact, a careful study of the Exhibition leads to the conviction that it is the cradle of a new and mighty power which we are thus allowed to inspect. At South Kensington, on the contrary, it is, we fear, rather a losing battle with the inconveniences of urban life that suggests itself as the net result. Let us hope that this may not be altogether the case as to smoke. As to electricity, there can be no hesitation in predicting an immeasurable future.

Regarded in this light, the most instructive feature of the whole exhibition is the collection

of historical telegraphic apparatus which is to be found in the north nave, and which is described on pages 13 to 23 of the official catalogue. Of these exhibits, the earliest goes back to a date beyond the memory, not only of ourselves, but of most of the visitors. It is the original model of a dial telegraph, invented by Sir Francis Ronalds, and laid down in the inventor's garden at Hammersmith, in 1816. Two dials, connected by a wire, were made to rotate synchronously by clock-work. When the letter which it was desired to signal appeared at the opening, a charge of static electricity from a Leyden jar was sent into the wire, and the divergence of two pith balls at both the sending and receiving ends indicated the letter. In this elegant invention, now sixty-six years old, lies the principle of what, in our opinion, is the most promising form of both the visible and the recording telegraph. The one stride,—and it is indeed a seven-leagued one,—that has been made since 1816, is the application of the electric energy itself to produce both the rotation and the synchronic movement of the discs. The first work on the electric telegraph in the English language was published in 1823, by Sir F. Ronalds, and a copy of it is to be found in the Exhibition.

In the second exhibit of this historical series we come to facts to which we have on former occasions referred as coming within the range of personal recollection. They are those of the first practical underground telegraph, which was laid between Euston-square and Camden-town stations in 1837, by Messrs. Cooke & Wheatstone. This telegraph sprang directly from the needs of the railway system. On the opening of the railway the trains were drawn from Euston to Camden-town over inclines which, in one part, were as steep as 1 in 66, by a rope, wound by a stationary engine, as the gradients rendered necessary by the levels of the Hampstead-road and Park-street were then thought too steep to be surmounted by the locomotive. It, therefore, became necessary to contrive a means of giving a certain signal from the platform at Euston to the engine-house at Camden-town, and a series of experiments, directed by Mr. Robert Stephenson, resulted in the employment of electricity for the purpose. The exhibit in question is a triangular bit of wood, in grooves in which five wires coated with gutta and pitch were laid, and wedged in. These five wires were connected with the same number of magnet needles, in conjunction with five Schweigger's multipliers. Each needle was capable of deflection either to the right or to the left, until it struck on an ivory stop. The directions of the needles formed a diagram, with letters at the intersection of the lines, and this first reading-board was known as the five-needle or hatchment telegraph. In 1838, by the omission of the letters C, Q, J, U, and Z, the number of needles and connecting wires was reduced to four. In 1842 it was found possible to give adequate signals by two needles only, and an instrument on that principle, which was fixed at Slough in that year, is shown at Sydenham. The instrument made in 1852 for the then new Houses of Parliament is also shown. In 1852 an improved form of double-needle telegraph was introduced; and in 1869 the modern form of the single-needle instrument was adopted. The use of the German Union Morse alphabet was adopted in 1855. This code, while the same in principle as the dot and dash system, is formed of inclined lines, long and short, and incline either to right or to left. The symbols for the letters have a much more alphabetic look than the plain dots and dashes, and might almost be mistaken, at the first glance, for Sanscrit or some cognate Indian letters, especially Tamil and Manichœm.

We pass over about a dozen further steps, due to different inventors, and come to the form which has always seemed to us the most valuable, inasmuch as it dispenses with any special study for the reading of the signal. This is the A B C instrument, in which the letters of the alphabet are either visibly arranged in a circle, or in which a wheel revolves behind the dial-plate, presenting one letter at a time through an aperture. This was accomplished in 1840 by Cooke and Wheatstone, on Sir F. Ronalds's plan, the revolution being given by a train of clockwork, actuated by a main spring. Another form of the same instrument has a pointer instead of a revolving card. In 1858 the modern form of this instrument was arrived at, the motor power being magneto-electric.

This highly-interesting part of the exhibition contains further a collection of keys, a collection

of relays, and other important appliances, including railway-signalling apparatus, insulators, batteries, and submarine cables. Here also is to be found a series of exhibits connected with a subject of great value to the architect, viz.,—a selection of lightning protectors used at different periods. These, of course, apply to the protection of the telegraphic apparatus; but the subject will be found, in another part of the exhibition, illustrated as regards the protection of spires, roofs, and buildings in general from the electric fluid. This is an instance of the manner in which the new science comes home to us, often in the most unexpected way.

Close to the historic series, and preceding it in the catalogue, is an exhibition of the modern telegraphic apparatus now used by the British Post Office.

Next to the use of electric agency for purposes of signal, came, in order of time, the application of the same multifiform energy for the purposes of the miner. It is thus appropriate to find the display of the "special stores used in submarine mining," which is made by the War Office, close to the historic collection above described. In this War Office collection, it may be observed, nothing is to be found which relates to the fish torpedo, or to any form of that formidable weapon of defence, except that which is now described as a submarine mine; that is to say, a case containing a charge of gun-cotton or other explosive, which is to be moored at a certain fixed point, and fired either by wire from the shore or by contact with a hostile vessel. Patterns are shown of these formidable weapons up to those containing 500 lb. of gun-cotton, or even more. There is also a telescopic apparatus, intended to give warning when the vessel is over a mine which it is intended to fire from the shore, called in the language of the catalogue, "arc firing." The instruments used on shore in connexion with this important branch of our naval defence are also exhibited. These are succeeded by samples of the field telegraph and mountain telegraph equipment now used by the Royal Engineers; by the field equipment of the same corps for hasty demolition; and by miscellaneous apparatus for the military service, including the Heliostat and the lime-light lantern for army signalling.

The general Exhibition (exclusive of the exhibits before mentioned) is divided into twelve classes, with a thirteenth class under the comprehensive title, "Miscellaneous." This arrangement is cross-divided into the two heads of English and Foreign exhibitors. Of the former there is also a fourteenth class, comprising generators, and steam, gas, and hydraulic engines, applicable to electric industries, which is not represented in the foreign part of the catalogue. Class I. contains apparatus connected with static electricity, in which the educational apparatus, as used by Professor Tyndall and other lecturers, possesses great interest, as showing how little comparatively was known on the subject when men who are not yet very old were at school. Class II. contains "batteries and allied apparatus," among which should be carefully noted the collection shown in the Southern Gallery by Mr. Blackwell, of 26, Chapel-street, Liverpool. The porous plates, cells, cylinders, and crucibles of Messrs. Stiff, as well as those of Messrs. Doulton, are to be found in this class; in which, under the foreign department, are also the secondary electric batteries of Léon Samzès, of Brussels, which the inventor claims to be more powerful than either the Faure or the Planté batteries. The Faure accumulator is to be found in the west corridor, and the air batteries of Messrs. J. H. Gladstone and A. Tribe in the south nave.

Class III. contains magneto-electric and dynamo-electric machines. Of these there are twenty-four by English, and six by foreign exhibitors. Among them we were struck by the compact solidity of Mr. Crompton's Birgin machines of the improved form, which received a gold medal at the Paris Exhibition. They supply the current for six arc lamps of 3,000 candles, and for one large central lamp of 6,000 candles. The Anglo-American Brush Light Corporation show a dynamo-electric machine for working forty lamps of 2,000 candles each on one circuit, and a machine for a single light of 150,000 candles. The numerous inventions of the Messrs. Siemens are in the west corridor. The exhibits under this class deserve very careful attention.

Class IV. comprises "cables, wires, conductors, and allied apparatus." There are



forty-three English and two foreign exhibitors. The exhibits of the "Telegraph Construction and Maintenance Company," in the south nave, and those of Messrs. Siemens, are here to be regarded, as well as specimens of the first submarine wire ever laid (by the Submarine Telegraph Company), a piece of which was picked up in the Channel by a fisherman's trawl twenty-five years after it was laid down.

Class V. consists of apparatus for measuring electricity,—a subject of too much technical detail to be discussed here. There are seventeen English and two foreign exhibitors.

Class VI. contains "telegraphic signals and allied apparatus." In this, as indeed in other classes, we find the same appliances in the hands of different exhibitors; the name of the inventor being replaced by that of the manufacturer or the seller. It is thus out of our power to do full justice to the admirable mechanic, or mechanic, who have done so much to perfect the printing instruments, and fire and other alarms, exhibited by the "Exchange Telegraph Company," and claimed as being patented by that company. It will be evident to any one familiar with our patent laws that the extent to which they can protect almost any invention in this exhibition, as to principle, must be very doubtful; and that it is by excellence of manufacture, joined to economy of price, that priority will in the long run be secured by any competitor. Thus the street fire-alarm system, which is an admirable invention, is exhibited and claimed as patent right by this company, and also by Mr. Bright, C.E. No. 122 on p. 49 of the catalogue. Posts are erected at fixed points, each of which contains an electric bell-knob, protected by a piece of ordinary glass. On an alarm of fire, the policeman or other person who wishes to communicate it breaks the glass, and presses the knob within. An alarm bell at once rings at the central station. A number corresponding to that of the post is at the same time there indicated, and on being duly noted the words "signal received" come into sight at the alarm-post. A more sensible and rapid mode of indicating the locality of a fire it would hardly be possible to imagine. Domestic alarms are made by the same manufacturers, so contrived that, when a house is shut up for the night, the opening of any door or window will at once set up a loud electric alarm, which will continue till the proper means be taken to restore quiet. It is easy to connect this apparatus not only with a house alarm, but with one at a police station, and the house disturbed may thus be indicated in the same way as that used for the fire-alarm posts. The universal adoption of this admirable system of automatic warning would go very far to render burglary impossible in a town, or even in a properly-watched country-house. The connections with the doors and windows may be so arranged as to be beyond the power of servants to tamper with them, the throwing the whole into, or out of, gear being readily controllable by the master of the place.

Class VII. contains telephones, microphones, and photophones, instruments of which the very names are but a few years old. There are twenty-six English and nine foreign exhibitors. Under this head will be found, in the Entertainment Court, numerous specimens of apparatus invented by Mr. T. A. Edison. The Western Electric Company of New York, Chicago, Boston, and Indianapolis, U.S., is an important exhibitor of these instruments. The articles manufactured by Mr. J. S. Lewis, of Birkenhead, are very carefully finished. This class is one as to which the verdict of a competent professional reporter would be of value to the public.

As to Class VIII., electric lighting, on the other hand, every visitor will be enabled, and probably disposed, to form his own opinion. There are thirty-eight English and thirteen foreign exhibitors. Patents, names, so-called "systems," and the several exhibitors, and, indeed, more so, as hardly one of them confines his efforts to a single piece of apparatus. But from the stand-point of practical inquiry, the modes of electric lighting are only two. There are the various ingenious modes of producing the arc light, which is, in fact, no other than a continuous electric spark between two points of carbon, usually open to the air, and there are the less varied forms of incandescent light. This we have before now described as a small glass globe or vessel like a minute soda-water bottle, in which is enclosed, *in vacuo*, a filament of carbon, made either of cord, cotton, grass,

or other vegetable material, which can be connected by means of wires with the electric circuit. In the arc system it is the resistance of the air, or of the slight break in the continuity of the circuit, which holds back the current until its intensity becomes visible in taking the leap. In the incandescent system it is the resistance produced by forcing the current through a very small and very refractory conductor which has the same result. The simplicity of the latter is so much greater that it would hardly be rash to predict that for any purposes of ordinary domestic lighting the incandescent plan will hereafter bear the bell. For large and powerful signals or centres of light, as for lighthouses, railway or shipping stations, or public works conducted by night, on the other hand, the arc light will be probably more suitable. As to this, the various "regulators" are only so many methods, some of them of great ingenuity and beauty, of keeping the points of the pencils of carbon accurately equidistant, notwithstanding the steady consumption of the carbon of one pole. Among those plans one which struck us as most admirable in its workmanship was a regulator made by Mr. A. E. Crompton, of the Arc Works, Chelmsford. The incandescent lamps require none of this complicated machinery, the connexion with the circuit being made simply by slipping the little bottle into its receptacle, the lighting then depending solely on the motion of the generator. Whether it be the Edison, the Lane Fox, or any other form, is a matter which it requires a special knowledge of the case to determine. To the general public the sole question will be that of price. The price of one of these little lamps has been reduced from 12s. 6d. to 6s., if not lower, already. We should venture to guess that the cost to the manufacturer cannot exceed a shilling. Each is reckoned to last,—that is to say, to remain with the carbon in order,—for 1,000 hours of lighting. We think there is little doubt that as much of this price as now represents patent right will gradually disappear, and that the cost of the incandescent light will be reduced to a sum that will cover the actual cost of the power required, the outlay on plant, and the fair manufacturer's profit on the same. At the same time, we must recall the fact that the effect on the eyes of the intense brilliancy of the electric light forms an obstacle of a very serious character to its permanent adoption as a source of domestic lighting. At all events, the subject is now fairly brought before the ultimate jury—the public.

Class IX. is extremely disappointing. It illustrates "Electric Motors and Transmission of Energy." In this, which is the part of the whole field on which the man of science is most anxious for full information, there are only seven English and eight foreign exhibitors. The exhibits chiefly refer to what are called small motor powers, as, for example, a small motor (which could be put easily into the pocket) for a sewing-machine. The all-important problem of transmission of energy is hardly in any way illustrated here. We should have thought that store batteries, or accumulators, with their respective modes of charging and of distribution, ought to have been fully illustrated under this class.

Class X. consists of electro-medical apparatus, as to which we have only to remark that while we can bear personal testimony to the admirable effect of the interrupted secondary current in the relief of acute lumbago, the subject is one which perhaps, more than almost any other, lends its hand to quackery. At all events, the sixteen British and two foreign exhibitors present a wonderful variety of "infallible cures."

Class XI., electro-chemistry, is one in which the exhibits may be regarded as almost wholly scientific. Many of them are of great elegance and beauty. There are eight British, and five foreign exhibitors. The electro-coppered press frames and plungers, as well as rollers, exhibited by the Broughton Copper Works Company, of Manchester, are wonderful triumphs of electro-metallurgy. The electro deposits of Messrs. Elkington, the applications of local electric action to chemical work by Dr. Gladstone and Mr. Tribe, and the various forms in which nickel is exhibited by Messrs. Wiggins & Co., of Birmingham, are among the most interesting items in a class which may perhaps be called almost the most instructive part of the whole exhibition.

In Class XII. we enter on a wholly different field, comprising magnets, compasses, horology,

instruments of precision, &c. Of this, as also of the two following classes, we have not now room to speak, although the practical value of many of these exhibits is not inferior to that of any other class in the building. We hope that we have been able to give our readers some idea of the enormous field now open to the labours of the electrician. And yet, numerous as are the exhibits, and comprehensive as are many of the classes, there are great departments of the vast subject wholly unrepresented at Sydenham. Such, to go no further, is the meteor-electric apparatus for automatic observation, record, and advice, which has been brought to such high perfection in Belgium. Such is the application of electricity to horticulture, and even to agriculture. Such, above all, is its application to locomotion. The man who is at home with the latest outcome of the science and the art of the electrician, in all its unbounded range, may well be described as having "taken all human knowledge as his portion." These must be dull at learning, and incapable of being amused, who fail to draw delight from a visit to the Electric Exhibition at the Crystal Palace.

#### THE THAMES EMBANKMENT.

LONDONERS have recently had their attention rather rudely attracted to the Thames Embankment, and not a small section of the community has learned with dismay that a thoroughfare brilliantly illuminated with the electric light has at night as was ever Hounslow Heath or Crankall-common in the days of Tony Lumpkin. The theories of the moral influence that the electric light was to exercise on society,—driving crime before it like the criminal who dies before the Nemesis of Justice in Prud'hon's famous picture,—would seem to have received a singular shock when murder is committed under the all-searching eye of the Brush system. But the fault lies not with the electric light. We are not prepared to enter into the social bearings of the question, with its sad proof of the moral depravity of certain sections of the dependent classes in our great city, the existence of which we ascertained when probing the back slums of London at a time when the fact was scarcely believed in. To blame the police is not within our province, but must it not appear to every one familiar with the Embankment that perhaps the chief cause of the terrible stories that have lately been brought before the attention of the Home Secretary consists in the loneliness and desertion that reign after dark along the broad thoroughfare which stretches its length from Blackfriars Bridge to the Houses of Parliament? We do not speak of the even more lonely and scarcely less suspicious Albert Embankment on the other side of the water, and again, on the northern side, the Chelsea Embankment.

By a strange fatality, these great undertakings, which rank among the best works of modern days, such as moralists have at all times considered as no mean agencies in the general spread of civilisation and refinement, have found their earlier history associated with tales of ruffianism that recall the dark ages, or the times when London streets were dimly lighted with the flickering oil-lamps which some of us still among us remember to have seen in their youth lingering on with characteristic traditionalism in Grosvenor-square. The reasons are simple that can be assigned for the perpetration of crime under the very shadow of the Temple and the Clock Tower, on which burns at night the great mast-head light that tells us when our legislators are at work. The Embankment is, as we have remarked, after a certain hour a deserted thoroughfare, except to a few stray foot-passengers, a few rattling hansom-cabs, and a few heavy wagons and drays; otherwise the broad stretch of roadway, with its prettily line of trees and seats, the electric light, the superb view of the river,—on a calm night, within the long reflections in the water, one of the grandest sights in the world,—is practically deserted, or, as we have recently had occasion to see, frequented by dangerous criminals. It is evident that the mere increase of the police-force is but a half measure, scarcely calculated to recommend the thoroughfare to peaceable citizens. What is wanted is some measure of a slightly more humanising character.

To those familiar with the cities of the world it must constantly be apparent how magnificent an opportunity is wasted in the mode in which



the Embankment is laid out. The long, gaunt spaces in the hands of the Duchy of Lancaster or the Vacant Lands Commission, the blackened scaffolding of that monster fiasco the National Opera House, the stretch of railled-in garden, so charming in the daytime, seem to breathe at night an air of mystery and general desertion. What should be done to give the Embankment some of the life which will rid it of the shadow of death which the police reports prove to us has passed over the spot more often even than can be discovered? When the Embankment can be opened, and still more recently when Northumberland-avenue was cut through from Trafalgar-square, it was justly expected that not a small portion of the congested traffic of the Strand would be relieved; but human nature, with all its respectability, is, after all, but human, and it was not unnatural that the gaiety of the shops should attract more than the silence of the electrically lighted Embankment—the brilliant light only serving to enhance the darkness.

What is wanted along the Embankment is a line of shops, of *cafés*, of kiosks, such as give to the modern thoroughfares of the French capital their lively character. Properly planned, it would be scarcely possible to imagine a spot with greater capabilities than the Thames Embankment, with its broad pavements and broad roadway, the terraces formed by the river quay, the river itself, the monuments that line the thoroughfare, the Temple, Somerset House, Waterloo Bridge, the Savoy, Adelphi-terrace, the Oselski, York gate, the Charing-cross station, and Whitehall, ending with the picturesque and grandiose pile of the Houses of Parliament. Could the tide of traffic only be turned along the thoroughfare, there would be no need of doubling the police-force. The suggestion has, we believe, been made that the Embankment gardens might be more profitably used for building purposes; but here we demur. Chatham, who first called our parks "the lungs of London," would have rejoiced to see reclaimed from the filth of the river-bank the long line of green which stretches so pleasantly at present alongside the silver Thames. There are means of utilising in part the gardens without necessarily abolishing them. Why should not a line of shops be erected? The gardens would still remain, only a few feet of their area cut off by a space that would bring in a handsome yearly rental. Something unquestionably will have to be done before long, to render the Embankment less lugubrious. The two theatres which have now been added to its adornment will, it is to be hoped, commence the movement. Why should not the old "Folly" of William III.'s reign be revived?—the "musical summer-house" which, built on a barge and moored in the river off the Savoy, was frequented, 200 years ago, by all the fashionable folk, from the king and queen downwards. Here is an opening for a novel place of amusement. Every one who knows Paris remembers the "Bains de la Frégate" in the picturesque man-of-war moored in the Seine near the Pont Royal. Why should not some of our old three-deckers serve also as bath-houses, and keep company with the Naval Artillery Volunteers' floating battery off Somerset House? There are a hundred means by which the Thames Embankment might be rendered attractive; and when we hear of the crimes that are committed, protected by the deserted nature of the thoroughfare, it is time, we imagine, that steps should be taken to remedy the evil. Tram traffic, much as we hate it, might be established between Blackfriars and Westminster Bridges. The ingenuity of our Local Authorities could easily be employed in worse directions than in the consideration of a question which has now forced itself upon public attention in a somewhat alarming fashion. If we are to wait while building plots are filled up, it will be long before the Embankment is fully occupied, and even then the gloomy nature of the thoroughfare would be little alleviated. Concessions should be made by the authorities to induce initiative, just as Napoleon I. exempted from tax during thirty years all the householders who built up the Rue de Rivoli, or in the spirit of the large money rewards which the municipality of Brussels have awarded from time to time to the builders of the most successful façades erected in their grand new Boulevard Centrale. One feature unquestionably might be introduced, the French kiosk for the sale of newspapers or flowers. No one who, from experience, is able to compare the wretched condition of our ragged newspaper-sellers (their bills kept from

flying away by four or six large stones, like the roof of a Swiss chalet) with the comfort of the old ladies who occupy the French kiosks, so valuable an advertising medium, can cease to wonder why we, the home of the cheap and evening press, have remained so singularly primitive in our methods of street newspaper distribution. Why should the excellent *Colonnnes Rambuteau* of the Paris streets be forgotten, the pillars pasted over with their announcements of the daily theatrical amusements, and forming with their multi-coloured bills a picturesque feature in every Parisian landscape? Addressing as we do readers who in most cases are practical, mention should not be neglected of a feature in the Paris streets which every one who knows London cannot fail to have found at all times almost absolutely wanting, but which we are the only country in the world to have considered as a matter too delicate for consideration. Paris has recently gone even farther in this respect; a hundred *châlets de nécessité*,—elegant coloured-marble paneled pavilions,—have been erected throughout the city with a view to supplying at a rate accessible to the poorest (a half-penny) not only the means of comfortably satisfying the necessities of nature, but of affording a cheap lavatory to the public. These and a hundred other well-considered comforts, intended for the benefit of all, it is the duty of the Paris Municipal Council to discuss and adopt. Our authorities, in like manner, should take in hand, even more earnestly than they do, the embellishment of our metropolis,—the largest and richest city in the world; and the question of the laying-out of the Thames Embankment with a view to enlivening its now dreary and dangerous solitude should be foremost among the schemes to be considered.

#### ANIMAL ACTION IN NATURE AND ART.

A very brilliant audience, including the Prince and Princess of Wales and family, the post-laureate, and not a few eminent artists, was assembled at the Royal Institution on Monday afternoon to witness the exhibition of a large series of photographs from animals in motion, by Mr. Maybridge, of San Francisco, who has for some little time made the subject his special practical study. The exhibitor explained the mechanism by which the production of a series of instantaneous photographs of a passing animal was obtained, and which is already known to those who take any interest in the subject. It is sufficient to remind the reader that the photographic lens is uncovered at the instant of the animal passing it by the breakage of a thread drawn across the path at a suitable height, which allows of the completion of an electric circuit that releases the shutters which hide the lens, and which are actuated by very strong indiarubber springs pulling the lower shutter up and the upper one down, a momentary gap being left through which the lens acts, the exposure being calculated to be hardly more than the five-thousandth of a second in duration of time. So said the lecturer; we should imagine the interval could hardly be so short as this, but that it is very short is a point we draw attention to, for a reason that will presently appear. The lenses are spaced at regular distances, usually 12 in. Some of the photographs obtained from horses were published some time since in the *Field*, where they gave rise to a considerable correspondence.

The exhibition at the Royal Institution included, however, a very large number of photographs, showing a continuous series of the action of horses at every moment of their stride, in walking, "ambling," trotting, cantering, galloping, and leaping; and a most remarkable comment these certainly afforded on the usual representation of this animal in painting. Hardly any of the attitudes usually to be seen in pictures were to be seen in these photographs. Each set of photographs was preceded by a sheet or two of outline sketches of the way in which the horse had been represented in the art of various nations at various times in that particular action or pace; these might have been better drawn, but they were sufficient to show the ideas of the artists as to the position of the legs in the various actions represented, which in most cases differed essentially from the photograph actions. It is worth observing that one of the few correct representations was a drawing of a horse walking, copied from Flaxman; and also that the attitudes of some of the horses of the Parthenon frieze come

a good deal nearer to the reality, as revealed by the photographs, than any modern paintings. The lecturer was severe upon what he called the "conventional galloping horse" of the painters, of which a sketch was given, which fairly represented the usual aspect given to that phase of horse action on canvas, and which was further illustrated by a photograph from a well-known picture of a horse-race. Every one will remember the attitude alluded to; the horse with his fore-legs stretched out parallel before him and his hind-legs the same behind him. That, said the lecturer, was an attitude which no horse could ever be in, and its absurdity was intensified when, as in the picture photographed, ten or a dozen horses were represented all in the same attitude at once; an almost absolute impossibility, as a moment's reflection would convince any one, it may be supposed. Admitting that a horse at one moment of his gallop stretches out his legs parallel before and behind, he must at all events have many intermediate positions besides that in order to progress at all, and it could only be by a miracle that a dozen horses could all be in the same portion of their stride at one and the same moment. That is one side of the gallop question; there may, however, be a *per contra* to it on the artist's side, as we will suggest just now.

One or two of the points of special interest in horse action which the photographs brought out may be mentioned. One is, the straight and apparently entirely rigid line of the fore-leg at the moment of the weight coming on it. This position can only, in rapid action, last for an instant, and when seized and rendered stationary in a photograph it conveys the idea of great stiffness of action and almost contradicts the notion of speed; but it is exceedingly interesting as an evidence of the mechanical action by which the limb is brought for one moment into its most rigid position just at the point when the animal's weight is momentarily thrown upon it. Another incident worth notice is that whenever, as happens in the action of trotting and cantering, two feet are off the ground while the two others are on it, the two that are off are invariably in the centre of the action, so to speak; that is to say, the two planted on the ground are in the rear and in the front, the two that are off are hung between them. In the photographs illustrating the action of the horse in leaping, a remarkable point is that in coming down the horse never lands on the two fore-feet simultaneously, as he is almost always represented in painting; one foot is stretched before the other and lands first, breaking the shock, and the other follows. In the photographs from a man leaping a similar action is observable; one foot always strikes the ground before the other, in the intuitive effort to avoid too sudden a shock.

Many other interesting facts brought out by this curious series of photographs might be mentioned, but we must pass these by to come to what is really the gist of the matter from the artistic point of view. How do these revelations of photography really affect the problem of artistic representation? And in regard to this we must say that we believe the conclusion that an artist, to be correct, must represent one or other of the moments of action shown in photography, would be, to some extent, erroneous and misleading. We noticed before the extremely brief interval of exposure of the lens. Now, no spectator in regarding the movements of a horse in action, can follow or disentangle from the complicated movements of the limbs such brief moments of action as this. The spectator inevitably carries away in his eyes not the actual position of the limbs at some single instant, but the impression of the combined action of the whole,—an impression compounded of very rapidly succeeding instants of position. And it is this impression which the painter also must seek to convey. If he were to paint one of the positions seen by the photographic lens in "one five-thousandth of a second," he would really be painting what no spectator of the living animal ever does see or can see. It is argued by the inventor of this ingenious process of crystallising momentary action that when this system and its results come to be more generally and popularly known, the public will become dissatisfied with the painter's conventional positions, and will demand greater truth and accuracy. To some extent this is true. The conventional galloping horse of the painter must, we imagine, be discarded after this sharp photographic criticism. He must study to present in a more truthful and characteristic manner the actual impression



of the animal's movements, and the conventional galloping horse certainly does not represent this. But if he were to reproduce precisely any of the actions shown in Mr. Muybridge's series of photographs, he would be condemned not merely for producing what the spectator never has been accustomed to observe in nature, but for producing what the spectator never does and never can see. The movements are too rapid for them to be seen in reality, and the attempt to adopt them in painting would betwixt fix permanently before the eye an action which is too transient in reality for the eye to take in. The artist must generalise, and from the generalisation produce an attitude which conveys the total impression as the eye sees it. The photographed positions, properly studied, should be most valuable, in affording truer and more exact data for the painter to base his work upon; but it is in this way, and not by copying any one of them, that the impression of the true action will be obtained in the painting. It will be in this respect, we surmise, that the discoveries of the photographic lens will be of real value to the painters of animals. Treated in a more realistic manner, they will probably lead to failure. Of the scientific interest of the results obtained by this ingenious method of defining animal movements there can, however, be no doubt whatever.

#### CHARACTERISTIC THOROUGHFARES.

THE RUE MONTAGNE DE LA COUR,  
BRUSSELS.

It may be said of every street in a great town that it possesses its special character, and this, markedly noticeable in all old cities, is the case even now when whole acres of streets are called up at the bidding of the speculative builder to meet the requirements of increasing population, only that the character peculiar to each street may now be said to apply rather to whole neighbourhoods. But if every street possesses its own special character, every street cannot exactly be termed characteristic: such a quality is reserved alone to a few of the thoroughfares of the great cities. Every one knows which are the most characteristic streets of any town with which he may be familiar, and of them it may be said that the recollection of their character remains always fixed in the memory,—a fact which settles their claim to be termed "characteristic." We speak of Piccadilly, of Regent-street, of the Strand, of Cheap-side, of the Paris Boulevards, of Broadway in New York, of the Corso in Rome, of the Montagne de la Cour at Brussels, and so on, as "characteristic," and we all bear away from our visit the unfading recollection of the appearance of each of these eminently characteristic thoroughfares. We speak of one street as dull, of another as lively, of a third as fashionable, of a fourth as the opposite; of one street as possessing a character for having once been the haunt of fashion,—and the squalor that occupies houses once tenanted by wealth only adds a fresh quality to the scene. It is on its occupants, in fact, that depends the character of a street,—a character that stamps deep with its differences the bustling City lane, deserted at night and on the Sundays, and the stately West-end thoroughfare. At home or abroad it is the same; for human nature is the same everywhere, in spite of what some say that in these days of easy communication national peculiarities are being abolished, and the world reduced to one dead level. Fortunately each country yet sufficiently retains its character to give a zest to foreign travel, and afford a field for book-readers and those who make books.

We constantly see described the Boulevards of Paris. Paris is fast becoming almost as familiar to Londoners as is to them their own city; what will it be when the Tunnel is completed? It is not so often that Brussels is described and its several characteristic thoroughfares. Belgium is a country which, while it is well known to certain English travellers, is not, perhaps, sufficiently visited; some of our architects are, it is true, doing their best to Netherlands our country; to the profession, indeed, the quaint brick buildings and picturesque architecture of Belgium have long been familiar. If it is in search of character that one travels, it is not wanting in the country whose history has been so disturbed, and where are so strangely united two races so profoundly dissimilar as the Flemish and the Walloons. In the capital this character is singularly marked, for side by side with the sturdy English family abroad sailing

down the street, the nattiest of Parisian costumes, high-heeled boots hobbling over the terrible cobble-road, may be seen the sturdy Flemish *melkman* with her glittering brass milk-cans, with her bare be-petted hips, her shawl, muslin cap, and clattering fur-lined wooden shoes. It is for this reason that the Rue Montagne de la Cour may be said to be essentially a characteristic thoroughfare: in the first place its descent, or what is more, its ascent, when one is at the bottom, is a strongly-marked obtuse angle to the level of ordinary streets, leading, as it does, from the lower town, the Flemish quarter, the famous Grand' Place with its Hôtel de Ville and its quaint gabled houses, the broad new Parisian Boulevard Central, up to the King's Palace and the court end of the town, up to the pretty park and the Rue Royale, passing, it may be imagined, in its sweep through almost every stage of architectural freak that the Brabant capital is capable of showing, from the ponderous burgher architecture of the glorious days of Netherlandish history down to the prim quasi-Parisian architecture of to-day; from the new Bonree, with its strongly-marked resemblance to M. Garnier's new opera-house, up to, at but a short distance, the new monumental Palais de Justice. Down side streets peeps may be caught of older Brussels, of the more industrious part of the town, where still the cranes jutting out from the gables are used to hoist up to the warehouses of the upper stories the produce of a busy home manufacture as in the days of that delightful comedy the "Captain of the Watch," of our old and lamented friend Planché, which some of our readers were happy to see not long ago running a new life at the Lyceum Theatre.

By a walk up and down the Rue Montagne de la Cour one may know all the life of Brussels,—of the generations past and of the present,—from its regal and fashionable life down to the Flemish market folks, with their dog-drawn carts, of which it may be said that not even the most conscientious member of the Society for the Prevention of Cruelty to Animals could utter an objection, so cheerfully and happily do the faithful, well-fed beasts drag along by their master's side his cartload of bright milk-cans or vegetables. Characteristic, indeed, is the Montagne de la Cour and its prolongation, the Rue de la Madeleine. Facing each other, on one side the narrow street that turns into the Grand' Place, with its busy Flemish crowds, its delicately steeped Gothic Hôtel de Ville, and quaint seventeenth-century guild-houses; on the other side, the thoroughly Parisian Passages St. Hubert, with their throng of strangers, little journal, book and glove, stick and boot shops,—a Burlington Arcade ten times enlarged, and with fifty times its bustle and number of passers-by; up further the Montagne de la Cour, more Parisian shops, modes, and booksellers and picture-dealers (in whose shops are always to be seen a good selection of works by the sturdy modern Belgian school), the English money-changers, right up to the Place Royale, with its modern church, its princely hotels, and its romantic sprawling statue of Godfrey de Bouillon; in one corner the entrance to the Royal Museum, the Picture Collection, and the Public Library; a few steps distant the newly-erected Palace of the Fine Arts; and opposite it the town residence of the Comte de Flandre, the heir apparent, and, vaulting in the distance, the long line of the aristocratic Rue Royale, with its huge mansions,—in one of which, it will be remembered by readers of Thackeray, the Duchess of Richmond gave her famous ball on the eve of the battle of Waterloo,—the carriages waiting at the door to bear their owners for a drive under the pretty trees in the neighbouring Boulevard de l'Observatoire. It is all in a nutshell,—the Park, the Houses of Parliament, the King's Palace, the Palace of the Duc d'Arenberg, the Courts of Justice, the Bonree, the Grand' Place, the Hôtel de Ville, the Théâtre de la Monnaie,—and the Rue Montagne de la Cour is the leading artery that may be said to connect them all. It is not a broad ambitious street; on the contrary, it is narrow and steep, and tortuous; it is not a Regent-street or a Waterloo-place; there is no street in London that can be said to bear comparison with it, for in our own great metropolis the life of its inhabitants includes a population that almost equals that of the whole of the populous and industrious little kingdom of Belgium, so much of the activity of which may be seen represented in the characteristic Rue Montagne de la Cour.

#### THE ARCHITECTURAL DRAWINGS AT THE ROYAL SCOTTISH ACADEMY.

ARCHITECTURE is again most meagrely represented at this year's exhibition of the Scottish Academy, the number of drawings being about two dozen. The draughtsmanship of these is generally good, and some of the designs show more than average merit.

The "New Parish Church, Killearn" (David & John Bryce), is a common-place design of Early Gothic type; but the same cannot be said of the "Proposed New Parish Church Moffat" (Frederick T. Pilkington). There is always a marked individuality in the churches designed by Mr. Pilkington; he aims at striking and picturesque effects, and these he attains by departing from the usual manner of external arrangement, and by giving exaggerated importance to certain details. In this instance the skyline is cut up by several gables, and by large angle pinnacles. The spire is a graceful composition, tapering gradually from base to finial. The openings appear to be deeply recessed, thus securing light and shade, and the detail is of the Decorated period, freely treated.

The "New Catholic Church and Residence, Dunes" (Archibald Macpherson), presents a contrast to the foregoing as regards simplicity of treatment and adherence to time-honoured detail. It has the aspect of a small Early English village church, consisting of nave and chancel, with bell-cot over the chancel arch. The residence is detached from the church, and has no features to distinguish it from an ordinary modern villa. The "Proposed Baptist Church, Hawick" (David A. Crombie), has a decidedly Nonconformist look about it. Over a meagre doorway there is a triple lancet in the main gable, which is flanked by transepts, apparently occupied by staircases leading to a gallery. "St. Giles's Cathedral, Edinburgh: View of Albany Chapel Restored" (Hay & Henderson). This chapel was walled up by the late Mr. Burn during the alterations in the cathedral carried out by him about fifty years ago. It is well that it has escaped the fate of other such appendages to the cathedral which were then utterly swept away. As restored, it will add to the beauty and interest of the interior. "West St. Giles's Church, Meadow-place, competition design selected by the Presbytery of Edinburgh, with advice of their referees, Mr. J. M. Anderson, honorary secretary of the Royal Institute of British Architects" (Hardy & Wight). This is a church of some importance as regards scale. The architects have chosen the Flamboyant style. The prominent features in the drawing are a large window and a spire of considerable altitude, if the neighbouring buildings are represented upon a true scale. The spire rises from within the tower, with which it is connected by flying buttresses from the angle pinnacles. "South Leith Free Church," by the same architects, was described by us in a recent notice; the spire remains incomplete, and, as here represented, it will give consistency to the composition.

"Rattray-street Church, Dundee" (McCalloch & Fairley), is an unsatisfactory production. It is apparently covered by a roof in one span; the gable is divided into three by narrow buttresses, which terminate in corbelled-out pinnacles. The large window in the centre is superimposed by a projecting arch, and a fleche rises from the roof.

"Presbyterian Church, Interior, as carried out in Mayfield Established Church, Edinburgh" (Hardy & Wight). There is an endeavour here to impart to the pulpit end of the church a distinctive character by flanking that feature with perforated wooden screens. The pulpit takes the form of a platform, and the passages thereto are situated behind the screens. The arrangement is capable of further development than is here attempted.

"Accepted Design for New United Presbyterian Church, West Kilbride," and "Greenbank United Presbyterian Church, in course of erection at Greenock" (Hippolyte J. Blanc), are both carried out in a thorough and spirited manner, the former having a gabled tower and the latter a muscular broached spire. They are in advance of the general run of Nonconformist churches; the style partakes of an Early French Gothic character.

Why "Dunerae Park, the Residence of William Duncan, esq., of Dunerae," as designed by Mr. David Robertson, should have been illustrated and exhibited here we are at a loss to understand. It consists of a central square



block with side wings, such as may be seen scattered far and wide throughout the land, and which some people apparently consider the acme of a chaste architectural beauty. "A good square, substantial house, sir," but hardly a work of art. "Proposed Swimming and Turkish Baths, near Dean Bridge, for the Drumsheugh Baths Company" (John James Barnett), is illustrated by coloured elevation and sections. The roof is covered with red tiles, and the details have an Oriental character, in keeping with the purpose of the building. "Design for Municipal Buildings and Public Offices" (C. & L. Ower), has probably figured in some local competition. It is a pedimented structure surmounted by a dome, without marked individuality or dignity. "Central Station Hotel, Caledonian Railway, Gordon-street, Glasgow" (Robt. Rowland Anderson, A.). The architect has put his own stamp upon this building, and has shown considerable ability in the distribution of the fenestration, which is apt to prove monotonous in large structures of many stories divided into numerous rooms. The windows on the ground-floor are boldly arched, having rusticated sills carried up to a pointed arch, the actual opening being semicircular. The first-floor windows are arched and divided by shafts with foliated caps, and the upper windows are square-headed and mullioned. The roof is high-pitched and broken by gables, partaking of the Queen Anne manner, and a tower rises at the salient angle, which is rounded off.

"Design for Proposed Building for Trades House, Glasgow" (James Salmon & Son), is a happily-conceived elevation of Early French Renaissance type, consisting of two high-pitched gables divided by a clock-tower. Although the frontage is comparatively narrow, it has an air of dignity often wanting where more space is at command. "Design for a Bank, in Glasgow" (J. Dick Peddie, M.P., R.S.A.), presents evidence of refinement and culture. The leading lines are horizontal, but the eye is carried up by attached and fluted columns to two louvered domes on the roof.

A "Mausoleum erected at Anorum," designed by Mr. Peddie, is a severe monumental structure surmounted by a dome. It proclaims its purpose unmistakably.

Design submitted in competition for New Municipal Buildings, Glasgow" (G. Washington Browne), is Classic in style, with tower as angle. "No. 94, George-street, Edinburgh" (Kinnes & Peddie), is a narrow street frontage savouring of the "free Classic" school. The superstructure sits uneasily upon a plate-glass shop-front.

#### THE LATE J. J. MCCARTHY, R.H.A., ARCHITECT.

DURING the early days of last month, Mr. J. J. McCarthy, of Dublin, an architect of some note in his native land, passed away. For the last few years his health had been in a declining state, so his death was not altogether unexpected. It would be an exaggeration to say that the deceased was a great architect, although he earned the reputation of being a respectable one. He certainly was distinguished in the eyes of a large following of his patriotic countrymen and of the members of the community to which he belonged. His architectural practice was chiefly confined to ecclesiastical edifices, cathedral buildings, and churches for the Roman Catholic hierarchy and clergy in Ireland, and for nearly forty years his name has been more or less before the public. In justice to Mr. McCarthy, it must be stated that he started life with few advantages to serve him, and with small influence in his favour. The Church of which he was an ardent member, or a strong contingent of it, at least, patronised the youthful architect, and clung to him for the greater part, if not the whole, of his professional career. For a number of years his hands were pretty full of work, and he designed numerous churches; several in Dublin and environs, and others throughout the provinces. The civil buildings of the deceased architect were, as a rule, the least successful of his works, and his forte, or taste, certainly lay in the direction of the Gothic style as applied to ecclesiastical structures.

Among the chief works of the deceased architect are the Church for the Dominican Order, Dominick-street, Dublin; the "Star of the Sea" (a Catholic church at Sandy Mount, Dublin); the church at Dunganon, county Tyrone; a cathedral at Monaghan; the completion of the Roman Catholic cathedral at Armagh; the

Rathdrum Catholic Church; a church and collegiate buildings at All Hallows Missionary College, Drumcondra, near Dublin; and a number of other churches, additions, and buildings for the Roman Catholic clergy in Ireland.

At the time of the restoration of St. Patrick's Cathedral, Dublin, effected through the munificence of the late Sir Benjamin Lee Guinness, bart., Mr. McCarthy, among others, took an active part in the controversy that "restoration" gave rise to, and his criticisms were strong. A valid excuse certainly could be advanced on the part of Mr. McCarthy and his professional brethren, as Mr. Guinness committed the "restoration" entirely to his builder and to the superintendence of his son, who was also a builder, but possessing some abilities as an architectural draughtsman. The Irish baronet, however, stuck to his family builder and his building-architect son, and after a good deal of heartburning, the controversy gradually died out, not, however, to be entirely forgotten, as it has formed a chapter in the history of Irish architectural "restorations."

It may be as well to add here that the builder and his superintending son, as well as the worthy Irish baronet and merchant prince, have been some years in the grave, and several architects who took part in the controversy have predeceased the subject of our notice.

The deceased architect through his not uneventful life formed several literary and artistic friendships among the distinguished and leading men of the "Old Ireland" and "Young Ireland" schools of politics, though not taking any active public part himself in these organisations. He is credited with having contributed sundry papers on ecclesiastical, architectural, and art subjects to some of the journals and magazines of his time. Some of his architectural drawings were exhibited in the Royal Hibernian Academy from time to time, and several years ago, on the foundation of the Roman Catholic University, Dublin, he was nominated as a professor of architecture, though this appointment was little more than an honorary one. There are no doubt several of the deceased architect's admirers prone to look upon their countryman as the restorer of Gothic architecture in Ireland; but the facts of history are too strong to justify such a claim. The credit of being the father of the Gothic Revival, so far as Ireland is concerned, truly belongs to Francis Johnston, a distinguished native architect, the founder of the Royal Hibernian Academy, and its first president, who, though achieving his greatest triumphs in the Classic style, evidenced a remarkable versatility, and proved by his Castle Chapel, Lower Castle-yard, Dublin, that he was in advance of all his brethren in Ireland in Gothic details. Johnston died in 1828, and long before McCarthy began to practise. This much, however, must be said, in fair play to the deceased architect, that his buildings, whatever may be their shortcomings, certainly gave an impetus to the study of Gothic architecture in Ireland.

The following works by Mr. McCarthy are illustrated in the Builder:—

Monument in memory of Canon McCarthy, Mallow, Con.—Vol. for 1864, p. 50.  
Proposed Roman Catholic University of Ireland, Clonliff, near Dublin.—Vol. for 1864, p. 617.  
Cathedral of St. Mac Carthain, Monaghan, Ireland.—Vol. for 1869, p. 677.  
Church of St. Foyles, Limerick.—Vol. for 1871, p. 66.  
St. Pat. jock's Church, Dunganon, Ireland.—Vol. for 1871, p. 167.  
Roman Catholic Church of St. Mary of the Angels, Dublin.—Vol. for 1872, p. 407.

#### OBITUARY.

The Late Mr. George Legg.—Mr. George Legg, District Surveyor for the Belgrave and Fimlico division of St. George's, Hanover-square, died on the 13th inst. Mr. Legg was one of the oldest district surveyors, having been first appointed by the Middlesex Magistrates in 1844. He was appointed to the division of St. George's, Hanover-square, by the Metropolitan Board of Works, in 1858. His district, according to the last published return, produced a gross revenue of 328l. for the year 1880.

The Council of the Bradford Sanitary Association have appointed Mr. Malcolm Paterson, C.E., of that town, as their engineer. They have already secured a large number of influential subscribers, and are now commencing active operations. This is the first association of the kind established in Yorkshire, although several are flourishing in London, Edinburgh, and other leading towns.

#### THE CHURCH OF ST. STEPHEN, WALBROOK.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

At a meeting of this society, held on the 7th inst., Major Heales, F.S.A., in the chair, Mr. Thomas Milbourn, architect, read a long but very interesting paper on the above-named church. We extract the following portions of it:—

The Church of the parish of St. Stephen, Walbrook, as its name implies, was dedicated in honour of St. Stephen, the proto-martyr. The first church stood on the west side of the street known as Walbrook. The second building stood on the east side of the same street, on the site occupied by the present church. The date of the foundation of the church is unknown. The earliest reference to it occurs in the charter of the foundation of the Abbey of St. John, in Colchester, in the county of Essex, in the following words:—

"Proterea ecclesiam S. Stephanus Walbroc, et domum meam petrinam juxta Newchurch, cum suis appenditiis."\*

The Abbey of St. John was founded by Eudo Dapifer (sewer or steward to William the Conqueror, Wm. Rufus, and King Henry I.), in or about A.D. 1096, or about thirty years after the Norman Conquest. It will thus be seen that the said Eudo Dapifer endowed the Abbey of St. John with, among other gifts, the church of St. Stephen-upon-Walbrook, and his house of stone, next Newchurch. Newchurch, here referred to, was afterwards called St. Mary, West Cheap, *alias* Newchurch. The Church of St. Stephen, at this early period, stood, as before mentioned, on the west side of Walbrook, as Stow quaintly describes it, "in place where now standeth the parsonage house, and therefore so much nearer to the brook, even on the bank."

Of this early structure but trifling information is recoverable; that it possessed a belfry is painfully recorded in the coroner's roll for the year 1278, which sets forth that—

"On Friday before the Feast of the Apostles Philip and James (May 1), in the fifth year of the reign of King Edward, the said Chamberlain and Sheriffs were given to understand that William le Clerke was then lying dead, by another death than his rightful death, in the Church of St. Stephen on Walbrooke, in the Ward of John Adre.† On hearing which the said Chamberlain and Sheriffs went there, and calling together the good men of that Ward and the Ward of Cheap, being the next Ward, diligent inquisition was made how this happened. Who say that the same William on the Sunday preceding, about mid-day, ascended the belfry of that church, to search for a pigeon's nest there; whereupon it happened that, as he was climbing from beam to beam, holding on by the rafters of the belfry, his feet and limbs failing him, he fell by mischance upon one of the said beams, so that by that fall the whole of his body was ruptured and crushed, by reason whereof he received his death, and died as soon as he came to the ground. And the body was viewed, upon which there was no other hurt, wound, or bruise, save only that the body appeared ruptured and crushed as aforesaid."‡

From an entry in the inventory of the church goods made temp. Edward IV., it appears that at the time of the building of the new church, three bells, with all the wheels, gear, &c., to the same, were then remaining in the steeple or belfry of the old church.

In confirmation of Stow's assertion as to the position of this early building being on the west side of Walbrook, I find that in the 28th year of Edward I., A.D. 1300, an inquisition was taken before the Mayor of London, "on Wednesday the morrow of the Translation of St. Benedict" (11th of July), to inquire who were liable to repair the covering over the watercourse of Walbrook "over against the chancel-wall of the church," when the jury empanelled decided that the parishioners of the church were bound to repair, and directions were given to the sheriffs to distrain on the parishioners to do the requisite works.§

In the course of the next 120 years the old church either became so much dilapidated as to need rebuilding, or was found too small to accommodate an increase in the population of the parish; at all events, the parishioners determined on the erection of a new or second church on the site occupied by the present building. The

\* "And also the Church of St. Stephen upon Walbroc, and my house of stone next Newchurch, with its appendage."

† Walbrook Ward.

‡ Riley's "Memorials of London," pp. 13, 14.

§ Ibid., pp. 43, 44.



ancient inventory of the goods, relics, and vestments belonging to the church. Edward IV. fortunately preserves to us, not only the precise date of the commencement of the second building, but also the date of its consecration, and an account of the ceremony of laying the several foundation-stones. The account is written at the end of the paper book containing the inventory, and sets forth that the new church was begun the 11th of May, 7 Henry VI., A.D. 1429, "Maistr Thomas Sothewel" then being parson of both the old and the new church. The account further quaintly states that there was present on the occasion "Robt Chechille," grocer and alderman of London, the founder of the said new church (and brother to "berry Chechille," then Archbishop of Canterbury), who laid the first stone; he also laid the second stone, in the name of "Willm Starndon," who, when living, was a citizen, and "w<sup>h</sup> whose gode the Grounde p<sup>r</sup> b<sup>e</sup> newe Chirohe stante now on and b<sup>e</sup> howayn w<sup>h</sup> all p<sup>r</sup> b<sup>e</sup> han stode p<sup>r</sup> on and p<sup>r</sup> Chirchyerde w<sup>h</sup> b<sup>e</sup> tenament anexid p<sup>r</sup> b<sup>e</sup> to whiche abuwed p<sup>r</sup> Ja to bere byndre lane was bought" by p<sup>r</sup> seyde Robt Chechille for j<sup>r</sup> c Marks of p<sup>r</sup> wardens of the Grocers of London and at p<sup>r</sup> time was letyn yerely for xxvj. marks." The record mentions the names of other persons who laid stones, including "Maistr Thomas Mapilton p<sup>r</sup> Kyngis mason p<sup>r</sup> being Maistr Mason of p<sup>r</sup> seyde Chirohe worke," and adds that "p<sup>r</sup> forseyde Robt Chechille gate and yave to p<sup>r</sup> seyde Chirohe werke cii. and also he made all p<sup>r</sup> tymbr werke of p<sup>r</sup> prosession place of his own Coste, and also he yave vs alle p<sup>r</sup> Tymbr and borde for p<sup>r</sup> j side ylls." The writer of this account further states that the new church was "halwed" (i.e., hallowed or consecrated) on St. Erkenwald's-day, 17 Henry VI., A.D. 1439. As will be seen by this account, the erection and completion of the church occupied the space of ten years. The paper book before mentioned also contains a description of the site of the church and churchyard, and the several measurements of the same. The details set forth in this record furnish us with the external dimensions of the new church, viz., on the west end, abutting on Walbrook, 66 ft.; on the east end, 67 ft.; on the south side, 115 ft.; and on the north side, 125 ft. Consequently, the church was one of considerable size. Of the internal arrangement and decoration of this second church the inventory affords some interesting evidence, and, by its aid, and that afforded by the churchwardens' accounts and the minutes of vestries, a tolerable idea can be formed as to the style, character, and decoration of the church. That the church was a Gothic structure there can be no doubt, and it was evidently erected in the Early Perpendicular style. The body of the church consisted of a nave, with clerestory, and two side aisles. There was also a belfry, constructed with two, if not more, stories, surmounted by a spire or steeple. The first church appears to have been standing at the time the ancient inventory was taken; but probably it was demolished shortly after the completion of the new building, though, as several of the early books or churchwardens' accounts are missing, I have not been able to discover what became of the materials. The churchwardens' accounts for 1476 contain the following entries relating to the steeple of the second church:—

"I<sup>r</sup> pay a Whit, carpenter, pur making of the thryd flor in the steppul, p<sup>r</sup> was not in hys couquant ..... xlijs. iiijd.  
I<sup>r</sup> pay a Whit pur making of the Newe Roffe in the steppul, and ij florys downward ..... v li."

In or about 1480 John Kelyll, wheelwright, was paid 5l. 6s. 8d. for timber, making the frame, and hanging five bells in the steeple. In 1483 the platform or story for the organs was erected, as set forth in the following entry:—

"I<sup>r</sup> payd to Ray, Carpynt<sup>r</sup>, for making off p<sup>r</sup> story for the organys ..... xxxvjs. viij d."

In the churchwardens' accounts for 1536 37 are set forth the several payments for stone work required in the construction of five new windows on the south side of the church, viz.:—

"flurst. paid for vij. Tonne of Kayne stone, p<sup>r</sup> the Tonne vjs. ijd.  
S<sup>r</sup> ..... xlijs. ijd.  
It. for the Custome of the same ..... xxd.  
It. for Craynage and waffage ..... xxd.  
It. paid to Robert Lynke, ffrason, for iij. dayes Worke ..... ijs.  
It. for the Sawe, to Sawe the stone, for vj dayes ..... vijd."

\* Duty.

In the accounts for 1518-49 we have evidence of the changes consequent upon the Reformation, such as the sale of the cross in the churchyard and the altar-stones in the chapel. In the following year, 1519-50, still further damage was done to the interior of the church by the removal and sale of the monumental brasses. From a bill for works executed internally and externally to the church, and dated 1600, it appears that William Massey, painter, and one of the churchwardens, was employed to execute the several works, at a cost of 72l. 6s. 4d.; of this amount 4l. 6s. 6d. was expended in painting "twelve angels in oil, with angels above them; the arms of the Grocers' Company, and all the other angels in both the side aisles, holding shields and arms." This account also furnishes evidence that there were twenty large columns or pillars in the church, besides smaller ones, and that a waistcoat, probably a screen, parted the body of the church from the chancel and the pews in the choir.

At a meeting of vestry held March 22, 1653, it having been reported that Mr. Ewer, "then Clarke," had "Catt away and impaired part of the round quarter of one of the pillars of the church," the vestry viewed the same, and found there was no cause for it besides "his owne fancie of squaring his wife's pen joyning to the said pillar"; and on returning to the vestry, finding the pillar had been much "weakened, disphased, and deformed, and not fit to remaine," resolved that he should put the pillar and waistcoat into the same "forme, order, and strength it was before"; the said work to be done by him within convenient time, otherwise the same to be executed by the Vestry, and the cost deducted out of his "following quarter's wages."

"And they did then alsoe further order, that henceforward hee doe not p<sup>r</sup>sume to appoint any works to be done in the Church, or to anything belonging therunto (except it bee the assent of a looke or such small matter under the valewe of 12d.)."

It also appears from the minutes that the vestry, before separating, agreed to release him from the cost of making good the damage done to the pillar.

No mention of the Great Fire is made in the accounts for the year 1666, neither is the Plague mentioned in the preceding account.

The churchwardens' accounts from Lady-Day, 1667 to the present year form a complete and perfect series, and contain matter of great interest relating to the history of the present building. In the account of John Simpson, from Lady-Day, 1672, to Lady-Day, 1673, are the following entries:—

"Y<sup>e</sup> 7th March. Pd. for a dinner at y<sup>e</sup> Swan in old fish Streete to enteri<sup>r</sup> Dr. Wren and other Suruours w<sup>h</sup> y<sup>e</sup> Vestry and others. Came to us ..... £9 9 0  
Pd to y<sup>e</sup> Suruor Genarrell p<sup>r</sup> ord<sup>r</sup> of Vestry 20 Guinees for a gratuelty to his Ladey to incuridg & hastin y<sup>e</sup> rebuilding y<sup>e</sup> Church. Came to 21 10 0"

In 1670, an Act of Parliament was passed for rebuilding the City of London, for the uniting of parishes, and for rebuilding the cathedral and parochial churches destroyed by the Fire, by which Act the parishes of St. Stephen Walbrook and St. Benet Sherehog were united. By this Act it was also provided that the Church of St. Stephen should be the parish church of the two parishes so united. At the vestry held the 4th of December, 1672, some of the vestrymen were sent to attend at the Court of Assistants of the Grocers' Company, then sitting at the Grocers' Hall, to "begg their presence at y<sup>e</sup> laying y<sup>e</sup> first foundation stones of y<sup>e</sup> Church of St. Stephen Walbrook on the 17th inst, the said Company being patrons of the said church." In a memorandum following the minutes of this meeting, and dated 17th of December, 1672, it is set forth that the first stones in rebuilding the church were laid "in y<sup>e</sup> east foundation." These stones were sixteen in number, the first being laid by the then Lord Mayor, Sir Robert Han-on. At a vestry held 19th of February, 1673, it was ordered that:—

"Dr. Christopher Wren, in consideration of his great care and extraordinary pains taken in y<sup>e</sup> designe of y<sup>e</sup> Church, and assisting in y<sup>e</sup> rebuilding y<sup>e</sup> same, be presented him or his Ladey 20 guineys in a silke purse, and Mr. Woodroff y<sup>e</sup> surveyor with 5 guineys, and y<sup>e</sup> they both be invited and desired to dine w<sup>h</sup> y<sup>e</sup> Vestry at y<sup>e</sup> Swan in old fish Streete y<sup>e</sup> next Vestry Day, w<sup>h</sup> is appointed this day fourtynth."

At a vestry held the 31st of May, 1673, it was ordered that the church be forthwith pewed,

"the moddell for the work in scantlings and workmanship to be like St. Nicholas Coleabby." At a vestry held the 11th of June, 1678, it was agreed that Rger Dainer and Stephen Colledge should pew the church. By an order dated July 10, 1679, and signed by the Bishop of London and James Edwards, Lord Mayor of London, it was directed that the works to the tower should be carried on. This order was issued in consequence of the tower remaining incomplete.

Next to St. Paul's Cathedral, St. Stephen's Church, Walbrook, is Sir Christopher Wren's finest work, and it redounds to his credit that he should have left such a handsome monument to his memory in the parish of his nativity and long residence. One writer has gone so far as to assert that "Italy cannot produce a modern edifice to equal it in taste, proportion, and beauty." The plan of the church is an oblong or parallelogram, the nave, aisles, transept, and chancel being produced by an arrangement of Corinthian columns, thus giving a cruciform appearance; and the columns being raised on pedestals the same height as the pews enabled the architect to give them a light and elegant proportion without any want of strength. Another writer speaks of the setting-up of the dome of the church as "a kind of probationary trial" of the architect's, "previous to his gigantic operation of fixing one on his octagonal superstructure in the centre of his new St. Paul's." The length of the church within the walls is 82 ft. 6 in., by a width of 59 ft. 6 in. The height to the soffit of the ceiling of the side aisles is 36 ft., and to the top of the dome 63 ft.

Newcomen, in his "Repertorium," quoting from Stow, says that the tower of the second church was not destroyed by the fire or the bells melted. This is probably correct, but I infer from the nature of the work of the present tower, internally and externally, also from the great weight and height of the stonework, that no part of the stonework of the old tower was utilised, unless it was the foundations, and this is very doubtful.

During the recent repairs to the church internally and externally, executed under my supervision, I was instructed to remove the whole of the unsightly cement casing of the tower and north wall. In so doing I discovered part of the north wall of the old church at the west end of the north aisle, next the vestry-room, and against which a building had evidently stood jutting into Stocks' Market. On removing the cement work in the centre of the north wall, I found the north door\* bricked up as described in the Vestry minutes. I re-lined the face of this brickwork, and filled up the opening with stone to match the other work, taking care to retain the outline of the old opening. I also removed the face of the old wall at the west end, and faced the same with stonework corresponding with the other parts. On removing the cement work from the tower I found the stone facing had been considerably damaged in hacking down the stones to form a key for the cement. I was, therefore, compelled to re-dress the stones as far as practicable to remove the chisel marks, all decayed stones being removed and replaced with new. The several walls were not rendered over with cement early in the year 1813, as a writer at that date fully describes the architectural features of the church; but probably it was done later in the year, as I find a contract was entered into the 25th of June in that year for repairs to the church, at a cost of 1,633l.; therefore the gentleman who referred to what he termed "skinning St. Stephen's," in concluding a very animated speech at the Mansion House on the occasion of a meeting held to inaugurate a society for the protection of City churches, in 1880, and who declared his opinion that "Sir Christopher Wren never intended the stones to be exposed," formed a wrong conclusion. The north wall is divided into two stories, the first cased with Kentish rag laid in irregular courses, and the second or top story faced with Bath stone. On removing the cement work I discovered that the first story had been surmounted with a string-course, but this, as also the Doric architrave mouldings and cherny key-stones to the oval windows, had

\* Of the at one time intended north porch, for which designs were prepared by Wren. The project was abandoned, and the doorway ordered to be bricked up, on the ground (as recorded in the minutes of a Vestry held September 11th, 1685) that the "intended dore way for a porch into the Stocks Market was at the present a greato shynesse to the church by reason of the offensive stinks and sent y<sup>e</sup> came from several sheddys y<sup>e</sup> joynd to it, as a slaughter-house, herbe shop, &c."



been chopped off to receive the cement work. I replaced the string-course, but was unable to do other than carefully dress down the face of the stonework so as to remove the marks of the chisel. I was not able to remove the cement work from the walls of the clearstory, for upon examination of the same, to my surprise I found the walls were faced with red bricks, with Bath stone dressings to the windows, and that the whole had been cruelly hacked to key the cement.

The whole of the boarded floors and joists of the church are tainted with dry rot, and should be removed and replaced with new, otherwise ere long it will considerably injure the wood-work of the pews. I have strongly urged that the whole surface should be concreted and covered with asphalt, relaying all memorial stones *in situ*, in the same manner as I have recently treated the aisles in the Church of St. Mildred, Broad street.

I must not omit to mention that on examination of the ornamental work in the panels of the dome, some of which projects as much as 15 in. from the face of the panels, I found the material to be hair mortar, evidently well kneaded by hand to the required shape, and, whilst damp, trimmed up with some sharp instrument.

A brief discussion ensued, in which the Chairman, Mr. Somers Clarke, and other gentlemen, took part, and the thanks of the meeting were given to Mr. Milbourn for his interesting paper.\*

#### ARCHITECTURAL TERRA-COTTAS IN GREECE AND HER ITALIAN COLONIES.

The results of researches made by Herr B. Borrmann, in conjunction with Herren W. Dörpfeld and Fr. Gribner, on the classic terra-cottas found in Greece, Sicily, and Southern Italy, form the subject of a lecture recently delivered by the former gentleman before the Berlin Society of Architects, and printed in the Winkelmann Programme of the Berlin Archaeological Society for 1881. Their studies were confined to the terra-cotta material used for the artistic and constructive formation of the classic roof, and treat specially, and firstly, of the discovery at Olympia of an incrustation of entablatures (*geisa*) of ancient Greek edifices by U-shaped or angular-moulded pieces of clay fastened to the stone, such as are best seen at the treasury of the Gelenses at Olympia and at the temple of the centre citadel at Selinus. The decoration of these mouldings consists generally of a single or double network pattern, sometimes also of a wave ornament. Upon them rests immediately the crowning of the entablature, either in the form of a *cyma recta* running round it or a series of antefixa arranged over the eaves-course and making the calypters. Between the two systems is the peculiar crowning of the temple of the centre citadel at Selinus, with its continuous cornice of antefixa pierced for the outflow of water. It is proved that other buildings at Selinus have had this system in conjunction with entablature slabs; the latter were present also at Gela, and, judging from the fragments found at the various places, in the three temples at Syracuse, — those of Athene, Apollo, and the Olympion. Perfectly similar pieces were also formerly found by the Duc de Luyne at Metaponte, and recently at Croton and Pastum, while, strangely enough, no remnants of it have been discovered in Greece, Olympia excepted. On the other hand, an older technique and mode of construction may be proved at earlier seats of culture, such as Orchomenos, Mycenæ, and Olympia, the most remarkable example of which is afforded by the roof of the Olympian Heræon, discovered in all its characteristic parts. The latter shows the so-called ridge and gutter-tile system, with this difference, that the tiles and copings are not of equal size, but that the former are double the size, consequently have a flatter curvature than the semicircular calypters. The latter end at the knob with disc-like antefixa, while the ridge was secured by heavy semi-circular coping tiles, the fucials of which, again, were two colossal acroteria of a diameter of over 7 ft. A characteristic mark of this oldest description of architectural terra-cottas was a blackish brown, sometimes reddish brown, varnish-like coating of all outside faces. This

varnish shading was burnt in with the moulded pieces, upon which were painted afterwards the colours required for ornamentation, such as violet, yellow, and white. Another distinguishing feature is the preference shown for bold plastic forms, — such as rolls, rosettes, heavily curved and intersected cymation, — and, as regards their decorative painting, the application of linear, or geometrically constructed patterns, such as a series of leaves, the latter half-rounded off, zigzag and chessboard patterns, rosettes, and plaited bands.

In complete contrast to the dark varnish ground of the terra-cottas just described, we find in those of the succeeding epoch throughout a warm yellow clay used as a ground, upon which the drawings are painted in dark colours, generally in a regular alternative of blackish brown and red. The ornamentation, although for the greater part keeping to the severe character of the earlier examples described, passes gradually into freer treatment of such patterns as anthemias and variously-formed leaf-work. For roofing, the bent tiles were replaced by flat tiles, with lateral bands and specially shaped points for covering the joints, and, at first, with half-round, later (in Sicily throughout) roof-like calypters. The original forms of the cyma are various. In Greece, the profile employed with preference is one being flat on the under side and having a strong swelling on the upper, the characteristic ornamentation of which is a system of bell-shaped flowers and palm-leaves turned in both directions, up and down. Several profiles, different altogether in form, and reminding us of Egyptian oconaves, with peculiar leaf-work strongly chamfered or triangular-shaped, and a broad abacus above, have been found at Syracuse and Gela; also in the Gela treasury at Olympia. A contrast to this type is afforded by the cyma forms discovered in the western towns of Sicily (Selinus, Agrigentum, Himera), and consisting principally of flat surfaces and cymation, the inorganic formation of which is expressed especially by the accumulation and arrangement over each other of equal-sized members.

The gurgyles are pipes projecting from the gutter, and are decorated at their openings with a disc in the form of a rosette. Later, we meet with lions' faces, at first of mannered, but gradually more natural forms.

The objects being mostly formed of a coarse or unclean material, a fine coating of carefully cleaned clay was put on the outside faces which were to be painted. The drawing was slightly scratched in, a pair of compasses being employed for that purpose, wherever practicable, for rosettes, entwined work, and even for the outlines of leaves. Another mode of procedure consisted in engraving the drawing in the clay object, whence arose the impressed patterns with fine raised edges found in classic art. The outlines thus formed by either of these methods were filled with colour, and the objects hardened by one burning. Only in a few cases they were burned twice, once before, the second time after, painting. Stucco grounds, which would have afforded more scope for rich painting than was possible within the narrow limits supplied by the encaustic process of the terra-cottas, do not occur in Greek art, and appear to have come into use, as finds at Pompeii show, only since the Roman Empire.

Researches into the mode of applying colours, which is of importance also in the classification of vases, have proved that a new technique gradually began to prevail about the beginning of the fifth century B.C., in which the ground was not, as hitherto, light, and the drawing in darker tones, but the reverse, namely, the ground black, the drawing a light yellow, sometimes red. The ornamentation begins to display the developed forms of the flourishing periods of Greek art, in which free-hand drawing asserts itself in preference to the ornamentation, principally produced by mechanical methods, of earlier periods. The adornment of cymæ consists principally of the charming, always varying anthemias patterns. The antefixa and ridge-tiles bear palm-leaves, which unfold themselves between volutes or form acanthus bells. The faces of tiles show, in place of the former severe entwined bands, rosettes or wave ornaments, rich scrolls or laurel-beds.

The close of the statistic development is formed by the preponderatingly plastic patterns of the later Greek or Hellenistic epoch, during which colour gradually disappears, being applied only for marking immaterial details. Much-fancied motifs in the cyma of this period

are, besides plastic anthemias, branches growing out of acanthus-bells, which do no longer follow the movements of the profile, but appear to be simply attached outside. Upon this more or less plastic tendency, in which, as in the later Etruscan clay forms, figures became more prominent, Roman art followed, without displaying important local or temporal differences. On the contrary, the forms taken from Hellenic and later Italian art, and gradually varied, became more widely disseminated over the world, without, however, ever attaining either artistically or constructively the excellence of their models.

#### THE INSURANCE OF WATER FITTINGS.

It appears that the Birmingham Waterworks Committee contemplate what is termed "Insurance of Water-Supply Fittings," — that is, it may be assumed, these will be maintained in order by inspection and repair for an annual payment. One shilling per annum on low rentals, increased in proportion of rental; 2s. 6d. extra on bath, and 6s. extra on water-closet fittings. If the tenants will submit to examinations and pay such excessive charges, well and good; no outside person need complain. But experience induces me to doubt the fairness or the acceptance of the terms. That both water and gas fittings need looking after at short intervals is certain; and it will be as much in the interest of the sellers of water and gas to preserve fittings in good order, as it will be of the users so to have them. It is a fact notorious to waterworks engineers that, as a rule, more water is wasted by defective mains and fittings than is legitimately put to any good use. Take the metropolis, where, on an average, about 31 gallons per head per day are supplied all the year round; or, at eight persons per house, about 250 gallons are supplied for each house per day. Who believes that this is all fairly used? As the water supplied to the metropolis is for the most part pumped, — raised by steam power paid for by the companies, — one may fairly conclude that it is rather more the interest of the supplier than of the consumer that the fittings should be maintained in good order. The truth is, every water company or corporation supplying water by sale will, as an integral part of their business, some day soon, establish unceasing inspection and repairs of house-fittings for the ordinary water rental, as a question of economy. Over and over again, water company corporations and Local Boards have been driven almost to despair because the waste of water in their respective districts has been so enormous, running up to the absurd volume of 120 gallons per head, or 600 or 700 gallons per house per day.

To this condition did Oxford come some time since, so that with other places it had to discontinue constant service, and go to intermittent service to diminish the waste from defective mains and leaking services; but this did not prove a cure. Inspection and repairs of fittings have, however, stopped the waste. A large proportion of London is now on intermittent service, a small army of turn-cocks being employed day by day to turn the water on for one or two hours, and then to shut it off again. If these turn-cocks were inspectors and fitters looking after and repairing at once the fittings, constant service would be found to be by far the most economical mode of water-supply. This statement need not rest upon assertion, as it has been well based on fact in several places. The truth is, no public water-supply is complete unless unceasing supervision, inspection, and repairs form part of the system. This and this alone will be the best, the cheapest, and the readiest form of water-fittings insurance.

As to Gas-fittings, — gas is sold by meter; and consequently, if it is unduly wasted it is paid for. Companies may, therefore, come to the erroneous conclusion that waste is no concern of theirs, but rather, as more gas has to be paid for, is to their advantage. This, however, is a blind and impotent conclusion, as extravagant waste of any serviceable commodity cannot, in the long run, be good for any party. Wasting gas by leakage is dangerous as leading to explosions, but leakage forms only a small part of the evil of unjustifiable waste. Defective burners must be answerable for the worst and most damaging form of waste, as the gas passes partially unconsumed and unoxegenated, giving a blurred, smoky, and sulphurous flame, injuring all with which its fumes come into contact, and so discrediting a use of gas. Probably nine-tenths of the

\* Some further particulars of the works carried out at St. Stephen's, Walbrook, by Mr. Milbourn appeared in the *Builder* nearly a year ago (see vol. xi., p. 321).



complaints against gas arise in consequence of defective burners; if, therefore, gas companies employed examiners and fitters to inspect and repair or renew all gas-burners at short intervals, they would be material gainers even pecuniarily, as they would preserve customers and add to their number. This, then, for gas companies will be the best form of Gasfitting Insurance.

Electric lighting stores gas companies in the face boldly and unflinchingly, and if gas is to hold its own it must be burned in the best and cheapest manner; that is, by and with the most perfect fittings, retained perfect.

ROBERT RAWLINSON.

P.S.—In the meantime, periodical inspections of house-drains, water-closets, and their ventilation, water-supply fittings, and gas-supply fittings are being arranged for by private parties, both in London and in Dublin, at a moderate annual charge, and if the inspecting is regular and well done, it will be most beneficial to householders.

#### BASING HOUSE, PECKHAM ROAD.

An interesting relic of Old Camberwell will in all probability shortly disappear. This relic is the old house called sometimes the old Manor House and sometimes Basing House, on the south side of Peckham-road, near Rye-lane, at present used as a school by Mrs. Tattersall, who has occupied the premises for the last five-and-twenty years.

The house would seem to have been a portion of a mansion forming part of an estate purchased by William Gardynier, of Bermondsey, in the reign of Elizabeth. The family of the Gardyniers appear to have lived in this house for several generations, and there are a number of letters in the State Paper Office, addressed by different members of the family to various persons of distinction, dated from "Basings in Peckham." Sir Thomas Gardynier, who was knighted by Charles I., and became Lord of the Manor of Basing, appears to have been a kind of Dr. Cumming in his day, for in a letter to Lord Dorchester, dated 1630, extracts from which are given in Blanch's "History of Camberwell," he warns the then Secretary of State that in thirty-five years "the number of the beast shall be fulfilled," and intimates his intention of writing a book on the subject. Sir Thomas died, however, two years after this letter was written, and it does not appear that his intention with regard to the book was ever carried out.

George Gardynier, son of Sir Thomas, sold the manor of Basing in 1651.

The house has lost most of its characteristic features from additions and alterations made at various periods, but it has a good oak staircase and some wood-carvings on the upper floor, of the time of Charles II.

#### JUDGE JEFFREYS'S HOUSE, ST. JAMES'S PARK.

A SCAFFOLD has been recently put up in front of the house, No. 13, Delahay-street, Westminster. This house, the back of which faces towards St. James's Park, was formerly No. 23, Duke-street, and was the town residence of the infamous Jeffreys. It is a plain red-brick building, with a bold wooden cornice, and is not without a certain dignity and justness of proportion, so strangely wanting in most modern structures, and it will be a pity if by any injudicious additions or alterations these characteristics are destroyed. Jeffreys having obtained a grant from Charles II. of a plot of ground on the east side of St. James's Park, employed an architect to build him a very magnificent house with a private chapel and extensive offices. The architect appears never to have been paid for his services, Jeffreys contriving to put him off upon one pretext or another, until the Judge was compelled to seek refuge in the Tower, pursued by the execrations of an infuriated populace. A similar treatment of Henry Holland, the architect of old Carlton House and old Drury-lane Theatre, by Sheridan, is related in the *Builder* for 1855 (vol. xiii., p. 243).

Jeffrey's house is the second house northward of Storey's-gate fronting towards St. James's Park, and is readily distinguished by the stone steps leading down to the Park, and a passage-way through the ground-floor leading into Delahay-street. The chapel, which was to the north of the house, was pulled down a few

years ago, and a large house with a stone front erected upon the site. Here the mob assembled after the Judge's fall in 1689, and read upon the door of his house, with shouts of laughter, the announcement of the sale of his property. (Macaulay's History, ii., p. 77.)

#### THE BOILER EXPLOSIONS BILL.

This Bill, which was read a second time on February 22nd, is one of some importance, and seeks, by indirect means, to put some workmen in a safer position than they now occupy. The Bill does not include within its provisions any boiler used exclusively for domestic purposes, or in the service of her Majesty, or on board a ship with a Board of Trade certificate. As we have said, the Bill seeks to effect its object by indirect means, for its immediate object is to establish a Court of Inquiry into boiler explosions. As soon as such an explosion has taken place, notice is to be sent to the Board of Trade within twenty-four hours, with full details concerning the explosion. Then there is to be a preliminary inquiry by an engineer appointed by the Board of Trade, and subsequently, if necessary, a formal investigation in open court by two engineers and a lawyer. This court will, therefore, be very analogous to what is commonly known as the Wreck Commissioners' Court, though the latter is by no means a Court of Inquiry into wrecks alone, but into all shipping casualties, even to the blowing up of boilers. On the other hand, the proposed Boiler Explosions Court differs in two particulars. It is to be presided over by one of the engineers and not by the lawyer. The Wreck Commissioner has power to deal with the certificates of officers of the mercantile marine; here, the Court can only report to the Board of Trade, and unless there has been such gross negligence as to enable the Public Prosecutor to be set in motion, so far as we can see the report will be the end of the proceedings. Hence, any effect that this Bill, if it becomes law, can have will be solely indirect. We confess that, as this Court is, to use the words of Mr. Mason's Bill, to be composed of "competent engineers" and a "competent" lawyer (though we would suggest that, as regards the last "competent," it should find a substitute in "a stipendiary magistrate or a barrister of not less than seven years' standing"), it should be empowered to inflict some kind of punishment if it thinks it desirable, as a sequel to its inquiry. This, however, may possibly be a suggestion too thorough-going in its nature, but we confess we should regard the Bill as more likely to be effective if the Court had some such power, and not a mere reporting jurisdiction. It is in the interest both of masters and men that the Bill, if it is to become law, should be made as effective as may be, with as little hindrance to manufacturing enterprise as possible.

#### VANDALISM IN VIENNA.

In the Hofburg, the principal palace of the Austrian emperor in Vienna, which is about to be considerably enlarged and partially rebuilt, workmen have been recently engaged in fitting up special telephone wires from the emperor's library to the other parts of the palace. The wires had to be carried in one direction through the so-called Crown Prince's Passage, whose walls are covered with very large and valuable paintings, all by old masters. Last week, on going his rounds through this portion of the edifice, the Captain of the Palace discovered, to his horror, that the eyes of all the figures in these pictures had been cut out. Respecting the perpetrator and his motives nothing is yet known, but a strict inquiry has been instituted into the circumstances of the case.

#### A MONUMENTAL FOUNTAIN.

A CITIZEN of Leipzig who recently died left in his will the sum of 150,000 marks (7,500*l.*) to the Municipal authorities for the erection in that city of a "Monumental Fountain." It has accordingly been decided to open a competition for designs for the work. The authorities have attached to the programme the condition that the successful competitor shall undertake to execute the entire work according to his own plan for the above-mentioned sum. The first premium is 100*l.*, the second 75*l.* The judges are Professor Hänel, of Dresden; Professor Anton Springer, of Leipzig; and the City Architect, Herr Licht, of the same place.

#### A CHEAP GAS FOR HEATING AND MOTIVE POWER.

MR. J. EMERSON DOWSON delivered a lecture before the members of the Society of Arts lately, on the production and use of gas for the purposes of heating and motive power. The lecturer said that all were so accustomed to the use of coal gas for lighting purposes that by many it was looked upon as almost a necessity. Fifty years ago nearly all towns were lighted, or said to be lighted, with miserable oil lamps, and now the capital publicly invested in works for the supply of gas in the United Kingdom amounted to something like 45 millions, and for London alone it was over 13 millions sterling. The manufacture of lighting gas on so large a scale had naturally led to the improvement and cheapening of its production, and this had led to its more extensive use for lighting, and to its adoption, to a certain extent, for heating and motive power. This more general use had led them to become familiar with the advantages of gas as a fuel; but they had also learnt the unpleasant fact that its use for such a purpose was generally attended with much more expense than when coal or coke fires were used. They knew that gas engines were, theoretically, more efficient than hot air or steam engines, and that they could not burst like steam boilers; but their general adoption was greatly impeded by the high price of the fuel they required. Ordinary coal gas was admirably adapted for cooking and innumerable heating purposes, but, in the hands of careless persons it was certainly not economical compared with coal or coke. It had long been established that highly-heating non-luminous gases could be produced by decomposing steam in the presence of incandescent carbon, and it only remained to prove that the process could be carried out in a simple way at a moderate cost. The lecturer then explained Dr. Siemens's system, and the modifications of Messrs. Kalkhan's apparatus. He then described his own improvements in the manufacture of gas, by which he passed a mixture of steam and air through a fire, but he had adopted special means for producing and super-heating the steam, and for maintaining all the conditions of working constant and simple, and by so doing he had sensibly improved the quality of the gas produced. Gas manufactured under the more recent improvements cost a mere trifle. He observed that his gas could be rapidly produced, and at a very low cost, even if made in small quantities. He found that at the thirteen gas companies in and around the metropolis, the total net cost of 1,000 cubic feet of 14 candle-power gas sold was over 2s. 4*d.*, after allowing for the sale of residuals and without anything for dividends or interest on the capital outlay. It had been suggested that when gas was made solely for heating purposes it need not be purified at all, or very slightly, but he protested against the adoption of such a suggestion. That gas for motive power would play a most important part in the future was beyond doubt.

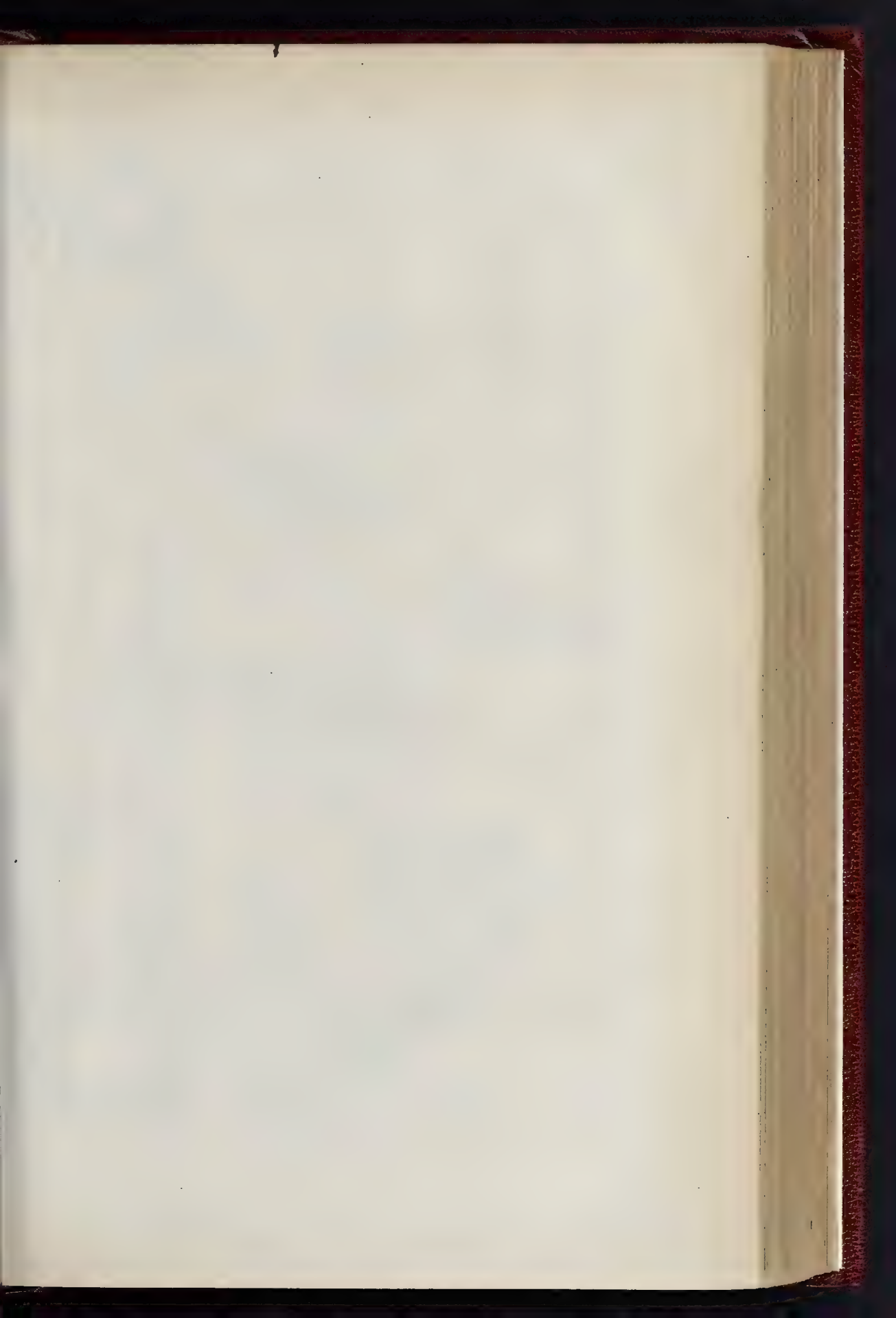
#### THE LARGEST CITIES OF ITALY.

THE populations of the twelve largest cities of Italy, according to the last census, which was taken in December, 1881, are as follows:—Naples, 495,000; Milan, 322,000; Rome, 300,000; Turin, 253,000; Palermo, 245,000; Genoa, 180,000; Florence, 163,000; Venice, 133,000; Messina, 127,000; Bologna, 123,000; Catania, 101,000; and Lagnoro, 98,000. Since 1871 Rome and Milan have increased the most rapidly, each having added 23 per cent. to their population; Catania has added 20 per cent.; Turin, 19 per cent.; Messina, 13 per cent.; Palermo, 12 per cent.; and Naples, 10 per cent. Venice has only added 3 per cent. to her inhabitants since 1871, while Florence has 4,000 fewer than ten years ago, owing to the removal of the seat of government to Rome.

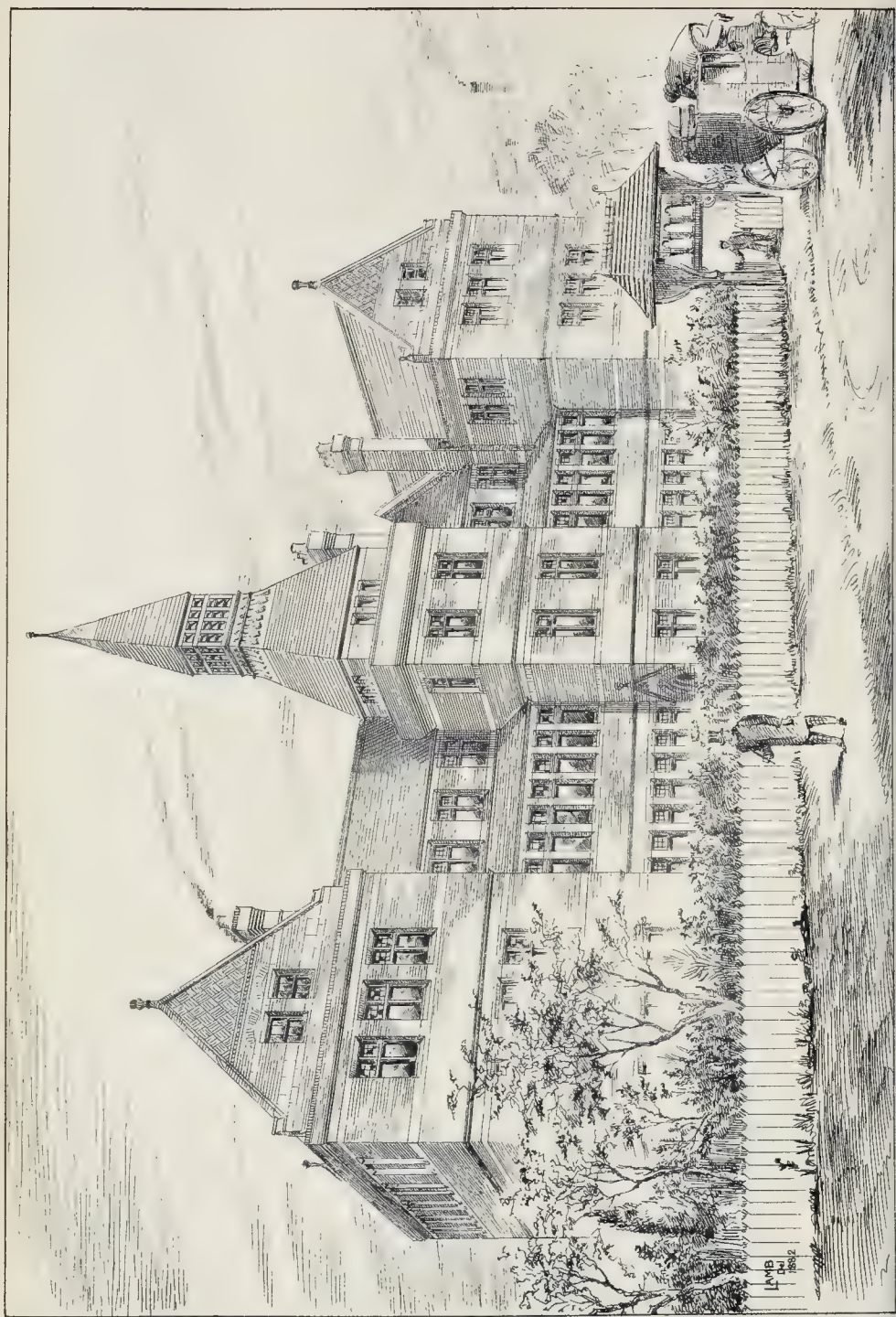
#### NEW INFIRMARY, ALTRINCHAM UNION, KNUTSFORD, CHESHIRE.

THE present Infirmary having been found too small, the Guardians decided to erect a new one, and use the old one for imbeciles, &c. The contract has been let to Mr. Martin Stone, builder, of Altrincham, for 5,750*l.* This includes a new boundary wall round the site. The architects are Messrs. Tate & Popplewell, of 20, Cooper-street, Manchester.

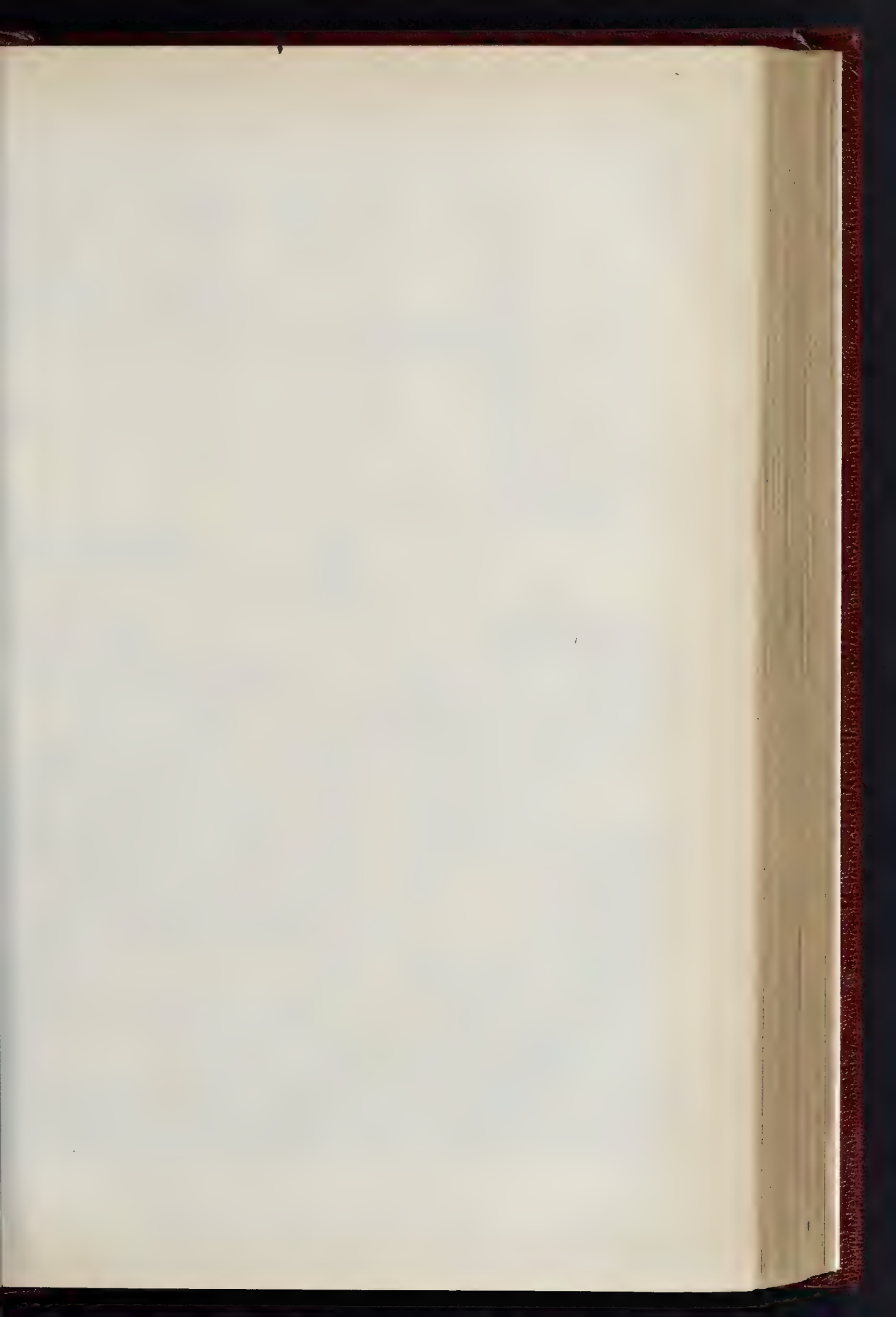


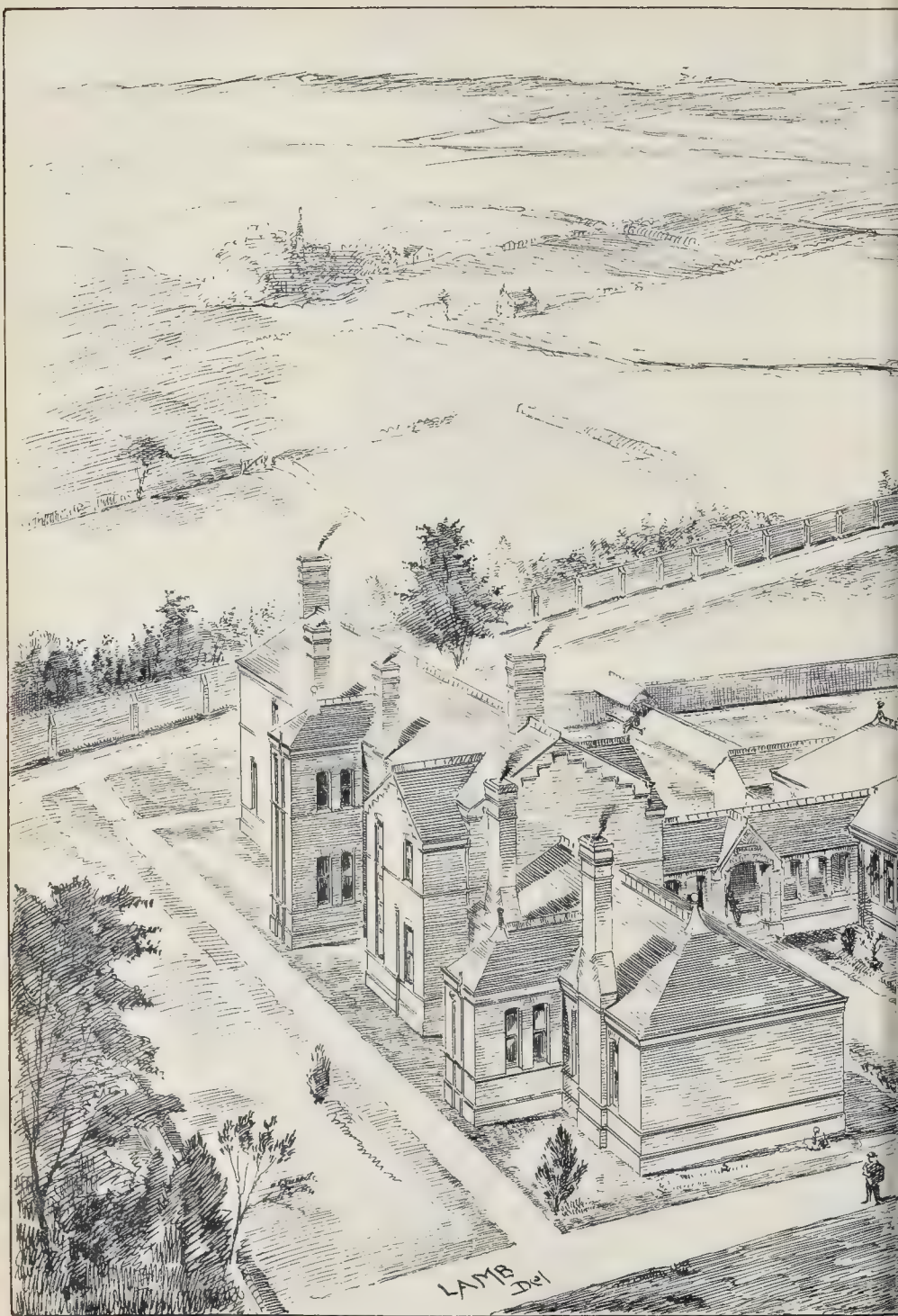


THE BUILDER, MARCH 16, 1882.



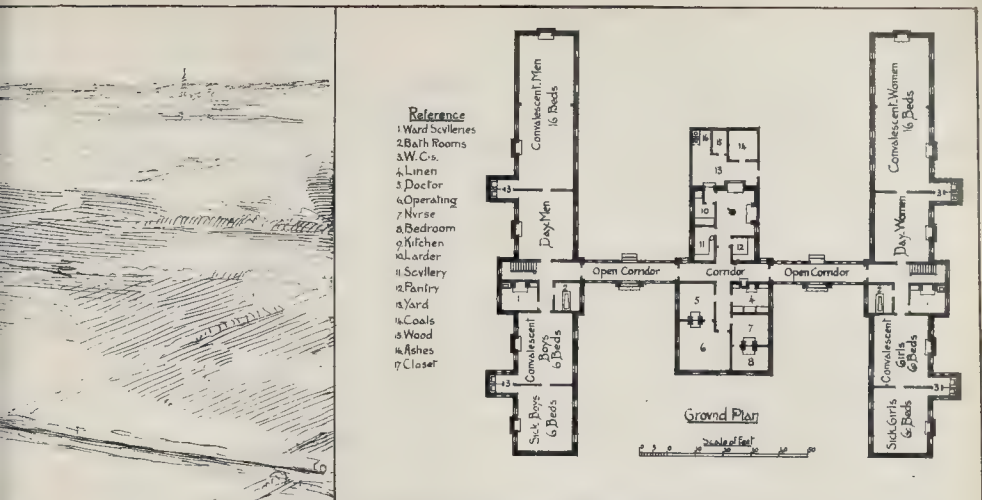






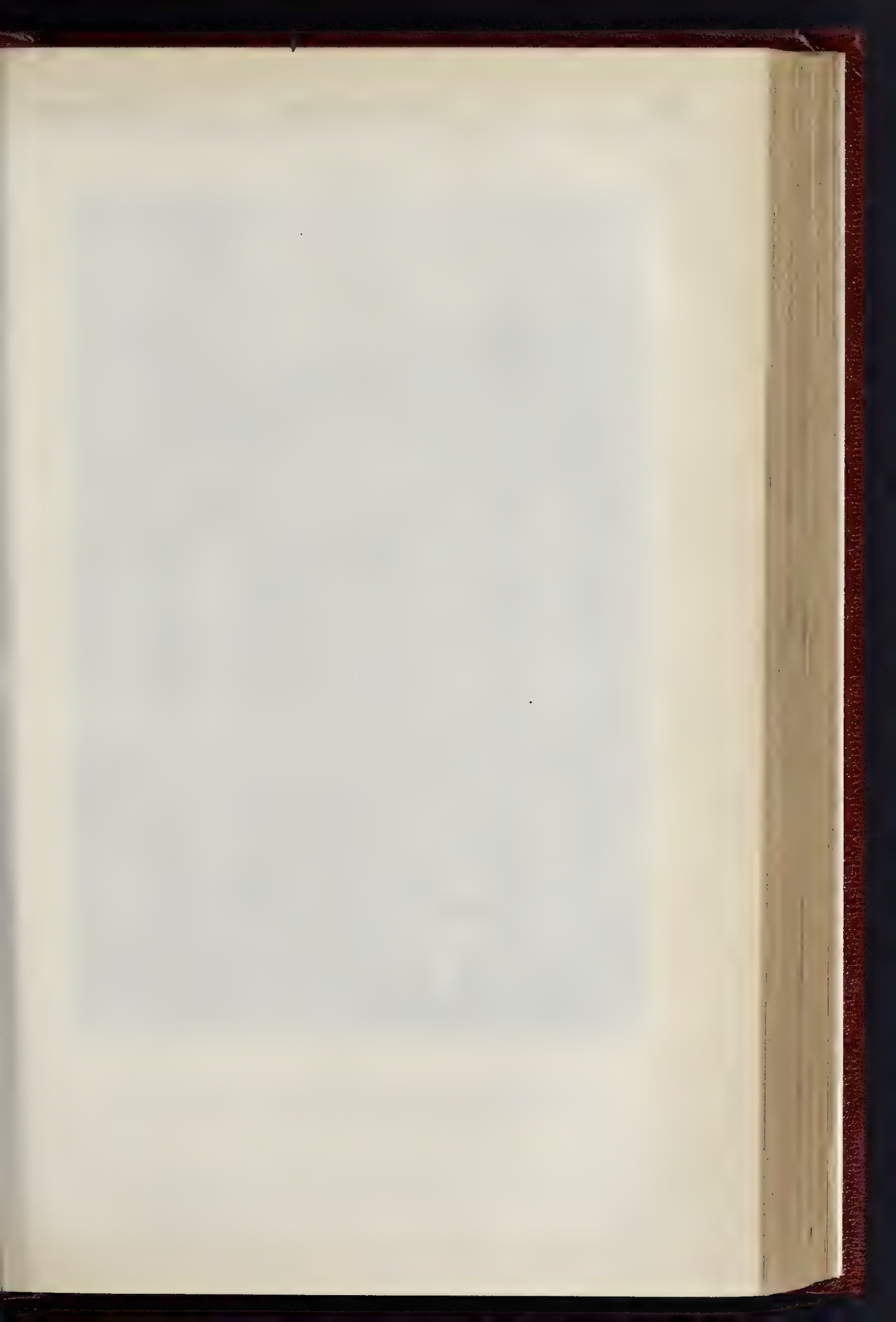
NEW INFIRMARY, ALTRINCHAM UNION, KNUTLEY

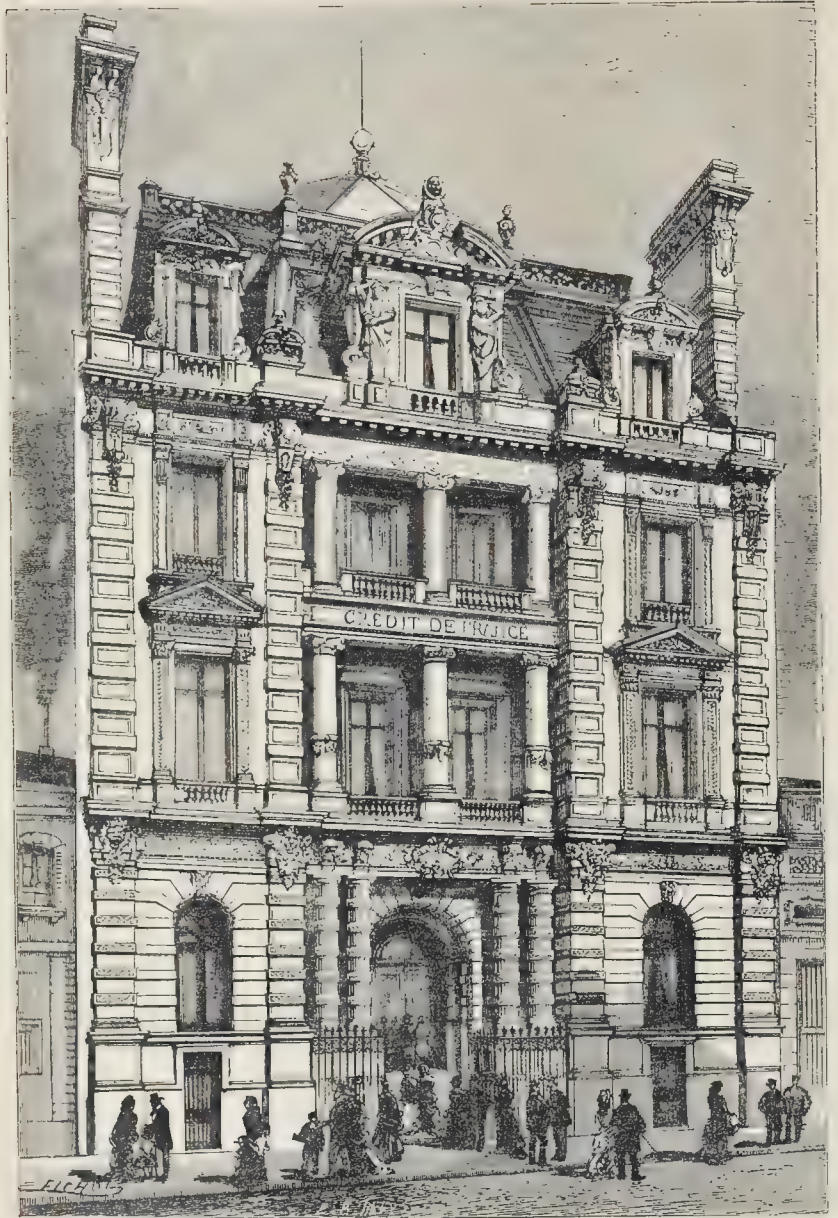












THE NEW "HÔTEL DU CRÉDIT DE FRANCE," PARIS.—M. REVEL, ARCHITECT.

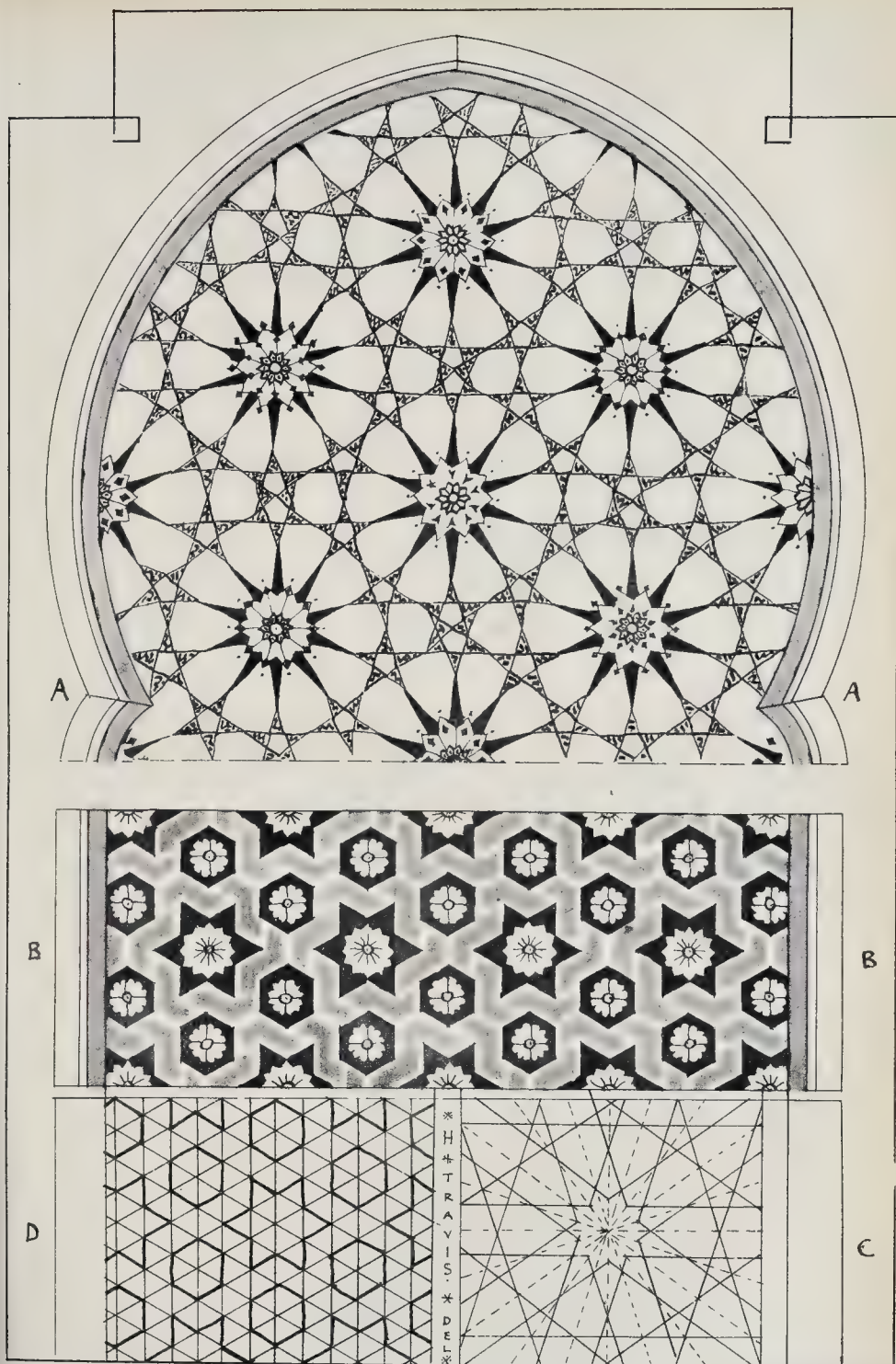




THE GREAT HALL IN THE "HÔTEL DU CRÉDIT DE FRANCE," PARIS.







F. Kell. Photo Lasho Castle Sindh Holborn

Wyman & Sons, Printers, C. Queen St.

DETAILS OF MOGHUL ARCHITECTURE, AGRA, HINDOSTAN.

A-B. Inlaid Work in Coloured Marbles on a White Ground. C. Geometrical of A. D. Geometrical of B.





### THE NEW "HÔTEL DU CRÉDIT DE FRANCE," PARIS.

The institution known as the "Crédit de France," originally established at No. 17, Rue de Londres, has outgrown its original quarters, and a handsome building has been erected for it at No. 16, in the same street. It has been erected from the designs of M. Revel, architect, in the style of the Renaissance, and we illustrate both the exterior and interior in our present number.

The flight of steps from the street leads to a spacious vestibule agreeably decorated, from which the large hall shown by one of our engravings is entered. In this three ranges of galleries, one above another, are formed by iron columns and girders.

The hall is devoted chiefly to the financiers, who are in constant communication with the public, banking business, payment of coupons, and so forth. The first floor, which is reached by a wide stone staircase, with wrought-iron railing, contains, besides a large ante-chamber, an apartment for the administrative council, and rooms for the president, director, and secretaries. The council-room is treated in the style of Louis XVI., and has a very handsome ceiling by Messrs. Gervex & Rey.

The basement, which is deeply excavated, includes some important apartments. The precautions against fire are such that one turn of a key, we are told, suffices to inundate a considerable portion of the building.

### SCHOOLS FOR ORPHANS OF FOREIGNERS, GLASGOW.

THESE schools will be supported by the subscriptions of a number of gentlemen, who have appointed the Rev. H. Stolischon preceptor and director. They will accommodate 100 boys and 75 girls. The two school-rooms are placed one at each end of a large dining-room. Two classrooms are provided to each school. The first floor is equally divided for the dormitories for each sex, with lavatories, bath-rooms, linen-rooms, &c. Great attention has been paid to the proper ventilation of the building. It is proposed eventually to erect a chapel and residence for master and matron as near as may be practicable. The cost of the schools will be about £500L., about half only of which is at present in hand. The architect is Mr. James A. Burton, of Lancaster.

### THE MOGHUL BUILDINGS AT AGRA.

THE mausoleum of Prince Etimsh-Doulah, from which we give some ornamental details in our present number, is built of the purest white marble, and stands in the midst of a beautiful garden, planted with cypress and other noble trees, and laid out with formal walks, fountains giving a delicious coolness to the air. Most of the decorations of this building, as well as the adjacent Taj, with its minarets and gleaming white dome topped with gold, the Sumas Boori, and the Khass-Mehal, are of inlaid coloured marbles and precious stones, brought from all parts of India, Persia, Arabia, and Ceylon. The designs are sometimes geometrical as here shown, and sometimes elaborately floral. Some further particulars will be found in our issue for Dec. 31, 1881.

These monuments are carefully looked after by the Government of the North-Western Provinces of India, and are well worth illustration in chromo-lithography.

**Tithebarn-street Station, Liverpool.**—The *Booth Times* states that the Lancashire and Yorkshire Railway Company have, at the last moment, resolved to abandon all previous projects for the extension of the Tithebarn-street Station at its present distressingly high level, and have taken into consideration the welcome alternative of constructing a totally new station on the level of Tithebarn-street. This they are advised by their consulting engineer, Sir John Hawkshaw, is perfectly feasible, and it is stated by the originator of the proposition, who is an engineer in this neighbourhood, that a very large saving in cost will be effected by thus placing the new station on the ground-level, as may be readily appreciated by any one who is familiar with the colossal system of vaulting under the present station, which was to have been reproduced in the new one.

### THE AIR WITHIN OUR HOUSES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the last meeting of this society, Professor Kerr delivered an address on the "Condition of the Air within our Dwellings." We print some of the concluding paragraphs, and a note of the discussion which followed:—

A circumstance had lately been brought out and traced, the lecturer said, which was, he confessed, somewhat new to him, and that was the question of vitality in bad air. To speak non-scientifically for the moment, beneficent Nature was never at a loss to create machinery which gained its ends. When we succeeded in producing the most abominable atmosphere in any room, continually and perpetually, which we could devise, Nature stepped in, and, in her quiet, silent way, applied a remedy, all her own, to this detestable condition of things. In work-rooms in London and elsewhere, where the air was polluted in the worst form from the causes which he had mentioned, and also by the changes connected with the processes of manufacture which went on,—and some of which changes were extremely formidable with respect to the pollution of the air-bath,—when the air had been brought into the worst possible condition, then Nature set up a compensating condition, and human life became adapted to it; and it seemed that human creatures who worked in those work-rooms had their vitality accommodated to the atmosphere. They did not die; they lived on to old age, but they lived on at a very low ebb of vitality. They did a minimum of work; their functions, generally, in such cases being mere routine and mechanical action. There was nothing which involved the need of intelligence, and, consequently, they carried themselves on in a dull, droning, wretched, miserable way, until they disappeared of sheer inanition, but not until after a long life. This was an instance of the way in which Nature accommodated herself. When they went into a work-room where the air was constantly renewed, or when they went into the open fields, where men were working in the air which Nature breathed with its own freshness, then they would find the maximum of vitality, and a large quantity of food consumed, as compared with a small quantity of food consumed in the other case, and the muscular action of the system at its best, and a large amount of work done as compared with a minimum of work done in vitiated air. This has been illustrated by two very remarkable instances which he had seen quoted, and which he would mention presently; but the question before them now which was to be illustrated was this,—that in the work-room in which the air was abominable there is no cleansing done, and the air-bath was polluted, and charged with pollution upon pollution, and no cleansing took place, but in the open air the air was constantly changed, and also in well-ventilated workshops. It was a question not merely between what people called fresh air and foul air, but what we recognised as cleansing *versus* non-cleansing. Here was the illustration to which he referred. In a certain work-room, occupied by a certain number of young women engaged in needlework, there was a very bad condition of ventilation indeed, and some kind scientific gentleman designed a simple process of ventilation, and the girls became lively, instead of being dull and stupid; and they struck for an increase of wages, not on account of increased intelligence, but because they said they could not live upon the old wages, as their appetites increased. Whether the lady at the head of the establishment struck up the ventilator again he did not know. In the other case, a certain barrack-room was described as being badly ventilated, and science stepped in again as a Good Samaritan, and introduced good ventilation. The soldiers did not stop up the ventilators, and they did not strike for more wages, but they struck for more food; their appetites increased, and their intelligence, and, no doubt, their activity, increased. The question had to be brought before the War Office, in the time of Lord Herbert of Lea. They would see perfectly well the application of these illustrations and the science which was involved. One more matter which he might mention was the question of actual disease in the sense of a disturbance of the bodily organs, to be treated medically, produced by want of cleansing of the air. They would not talk any more about foul or impure air, or pure and fresh air; but they would talk about an air-bath which was cleansed, as against one which was not cleansed. They

had all heard that in polluted air various forms of disease would come into existence; according to the old-fashioned formula, disease was said to be brought about by the medium of bad air. They all remembered the instance of Dr. Abernethy, who when he went into a sick-chamber, and found the chimney blocked up with a sack and the air otherwise carefully excluded, pushed his fist through the window in order to let in the beneficent air. We all now acknowledged the power of air and light, and doctors nowadays removed their patients to fresh air. They removed their patient from some back slum (of which there were too many in London and all large towns), to hospitals where there was plenty of space, and where ventilation was scientifically conducted. They all knew what was the cause of dry rot. He need not talk to them about it as a fungus upon the surface of wood. Where there was, under a floor or elsewhere, the presence of a great deal of moisture, with a certain amount of heat, this fungus grew rapidly. They also knew the cure. Let in the air, by putting in two or three air-bricks, and they drove dry rot out. So it was with disease. Dry rot might be said to be in the lungs or liver, simply by reason of the polluted air. In the fresh air this dry-rot would disappear. This was about the condition of things with respect to ventilation. They would ask, "How is this to be remedied?" He was not going to say; he left it to engineers to discover that. Speaking seriously, he thought they would agree with him that ventilation was still in its infancy, and that the problem of how to ventilate English rooms in English houses had not yet been fairly attacked. There were plenty of nostrums and patents, but there was nothing by which the air-bath of an ordinary room could be kept even reasonably pure. If there were, he should be happy to hear it described. It was of no use in these days to propose the use of anything which was complicated. If they had anything to propose with respect to ventilation, let it be simple. The more complicated it was, and the more ingenious it was, they might depend upon it the more pestiferous it would turn out. Let them consider how simply Nature did her work. They all knew what the air was, and what was its composition, and how it did its work with a simplicity which was perfectly alarming; and when he contrasted it with our perverted contrivances, he asked, was it not perfectly plain that in the solution of this great question of ventilation, simplicity must be considered, and complication avoided? The question was simply this, and this was the plainest and most scientific way of putting it. They had a reservoir of air in the interior of their rooms, and that must be kept in the fresh condition of the air in the open fields. He would not accept anything else. He did not say they could solve the problem; he did not say that it would be solved in his lifetime or the lifetime of his children; but it must be solved sooner or later, otherwise we must go on with our vital energies impaired, generation after generation, and civilisation be regarded more as an influence for the deterioration of the human system than for its improvement.

At the close of the lecture,

The President (Mr. Walmisley, C.E.) said he was sure they would all feel deeply indebted to Professor Kerr for his kindness in addressing them upon a subject which was of vital importance, and which demanded our best attention and the best scientific arrangements possible. There was no doubt, our system of house drainage was capable of very great improvement. As regarded the admission of fresh air, and the getting out of foul air, he believed that in the British Museum reading-room there was an arrangement for regulating the temperature of the air before it was admitted into the room, and the foul air ascended through holes in the upper part of the room. No doubt there was a good deal in that, but they did not want to have a draught.

Professor Corfield said that Professor Kerr had challenged them to show how ventilation could be practically accomplished. He did not think it would ever be accomplished to the extent demanded by Professor Kerr. Unless they had two sides of a room open he did not see how a room which was inhabited could ever have the air in it in the same condition as the pure exterior air. But we could do something, and what had been done was this: we could reduce the amount of impurity in the air in our rooms to such an extent that its presence was not felt by



any one coming into our rooms, and that condition was well known to chemists. The amount of impurity in the air of rooms could be estimated by the percentage of carbonic acid in the air. But that had nothing to do with the idea of the air being unwholesome, for the amount of carbonic acid was never so great as to be of importance to the phenomenon of respiration. It had been ascertained accurately, that when the carbonic acid in a room exceeded that in the outer air by two parts in 10,000 (the carbonic acid in the outer air being four parts in 10,000), then the other impurities made the air unfit to breathe unless we changed the atmosphere. There was no doubt that limit of purity could be reached by various methods, not by nostrums, as the Professor had referred to, but by plans of ventilation. In a certain barrack-room warm air had been introduced, and an upward direction given to its current, by which means, and without any draught, the air had been brought, he would not say to the standard of purity which he should like, but it had been brought down to about one-fourth of the impurities it originally contained. A great deal had been achieved towards the solution of the problem of ventilation without the aid of any nostrums. With respect to the beneficence of Nature, both as regarded architectural and medical subjects, he was disposed to agree with what Professor Kerr had said to this extent, that if they put themselves in a condition in which Nature could be beneficent she would be beneficent; but the instant they put themselves in a condition in which they were opposed to Nature, to any extent whatever, then Nature was maleficent to the highest degree. Take the case of a hospital where there has once been hospital gangrene; in many cases it could never be got out of hospitals without taking the buildings down. He gave one or two other illustrations which he contended went to prove that Nature is only beneficent so long as we find ourselves in circumstances which are advantageous to us.

Mr. E. C. Robins said that Professor Kerr had not left them much room for criticism. The Professor had told them facts which, no doubt, the generality of those present were well aware of; but the Professor had not shown them how to get out of the difficulty with respect to ventilation. Some of them knew that the problems were not insoluble, and some had been solved. Amongst other means, there was what was called Watson's ventilator, which was very suitable in deep basements, in stables, and many other places. Then there was what was called Tobin's system. He believed it was difficult to get the upward cast of the air, which had been alluded to, unless they had an upward shaft. He referred to the fact that stoves have been introduced which provide for a certain amount of ventilation.

Mr. H. H. Collins said he had come to the conclusion that the proper way to ventilate a room was to warm the atmosphere before it was allowed to enter the room. He mentioned Wake's hydrostatic calorific stove, where the water was made to circulate through a tube and an upward current was given to the warm air on entering the room. Of course this system involved the introduction into a house of hot-water apparatus. He hoped they would not soon arrive at the period when the walls would be made so porous that the air rushed in. As regarded manure in the open air being so innocuous as the Professor had stated, he was inclined to take a somewhat different view; and he mentioned a case in which a lady, who had been residing at one of the bungalows near Westgate-on-Sea, was laid up with a severe illness, and, upon an investigation into the cause being made, it was found that the fields around were manured with seaweed. With regard to the soil on which houses were built, the Metropolitan Board of Works had recognised the necessity of controlling this matter, and required that the whole surface of the ground on which a house was to be built should be covered with 6 in. of concrete.

Mr. R. E. Middleton said he thought the best results which had been attained by ventilation had been brought about by the use of warm air. But they wanted health in the houses of the poor as well as the rich,—in fact, they wanted more ventilation in the houses of the poor, and it would be impossible to provide hot-water apparatus in poor houses. No doubt, our fires were not healthy, but they certainly were not so inimical to health as the stoves used in America and Germany. He agreed that in ventilation it was necessary to have a good

upward current of air. There were many simple contrivances which would provide fairly good ventilation. As to drainage, as at present carried out, one great object of engineers was to have a perpetual current of air through the drains, and there was no reason why this should cost a large additional amount.

Mr. B. Houghton said he was inclined to agree with Professor Kerr that ventilation had made no extension during the last thirty years. He discussed it thirty years ago from an engineer's point of view, and then the universal idea was that there could be no such thing as ventilation in the simple way the Professor demanded. They must have a heated current of air to ventilate a room properly; but, if they had a heated current of air, why not dispense with a fire in the room, and heat the room at the same time they ventilated it? With regard to stables, an excellent plan to sweeten them was to use saw dust, which annihilated the injurious matter. It was not necessary to use sawdust as litter, but a small quantity scattered about the stables would be sufficient.

Mr. Wm. C. Street said that whilst Professor Kerr had been calling the engineers to account, he might have called to account the architects. For his own part, he did not think the problem to be solved was so difficult, were it not for the people they had to deal with. In small dwellings it would generally be found that the ventilators were kept closed, because people fancied there were draughts. He thought the simplest plan of ventilation was the best; and he had not found anything to beat a small valve near the ceiling which, to all intents and purposes, kept the air pure. It seemed to him that, if they heated the building with warm water, they would just heat the stagnant air-bulk to which the Professor had alluded. As regarded the ground-air, that was not a very difficult thing to deal with in London. In deep basements, if they put around a coating of asphalt it was sufficient to keep out air and water, and render the building free from ground-air and damp.

Mr. H. T. Munday said he thought the problem of ventilation would never be solved to the extent demanded by Professor Kerr, because it might be taken as an axiom that the air within our rooms could never be so pure as the air outside, which was the only thing which Professor Kerr would accept. He could not quite agree with what the Professor had said about nostrums which engineers had introduced to meet the requirements of drainage; whilst we lived as we did we must have some "nostrums," or some contrivances, to overcome the conditions of life under which we have placed ourselves. He thought the only means of dealing with sewage was by water carriage, at the same time putting in as many ventilators as possible on the line of the channels. As regarded this question of drainage, if the engineer had taken the matter out of the hands of the architect it was because the architect had not attempted to deal with it.

Dr. English said he thought that for good ventilation the window ventilation, with an escape for the foul air in the ceiling, seemed all that was necessary.

Professor Kerr, in the course of a brief reference to some of the comments which had been made, said that when he mentioned the word "nostrums" he did not, for a moment, mean to speak disrespectfully, but what he had said was borne out by what had been stated about complicated arrangements and apparatus, and the difference of opinion which existed in respect to the matter. As regarded the test of carbonic acid, he contended it was not a fair test of the impurity of the air in the conditions under which we lived, and he thought scientific men should turn their attention to other tests as to the purity or impurity of the atmosphere. As regarded porous walls, what he said on that subject was merely a suggestion in the abstract, and he guarded himself against advocating it practically. He could not recede from his position in demanding that engineers should challenge criticism on this matter of ventilation. As regarded drainage, he would not venture to propose open drains for London, but the more the drains were ventilated the better.

**An Exhibition destroyed by Fire.**—Dr. Jannasch, of Berlin, has received a telegram from Port Allegre in Brazil, announcing that the Exhibition recently opened there has been totally destroyed by fire.

#### ON THE SCIENCE OF PROPORTION IN RELATION TO ARCHITECTURE.

THIS was the title of a lecture by Mr. W. Cave Thomas, read before "The Society for the Fine Arts," at their rooms in Conduit-street, on the 9th inst., Mr. G. Godwin in the chair. The lecturer began by urging that the entire visible world consists in proportion, and that the great constructive principle of Nature is adaptation to purpose. But as all things consist in proportions, the principle of adaptation to purpose resolves itself into that of adaptation of proportion to purpose. Those who could not mentally grasp the doctrine of proportion in this, its entirety, would, nevertheless, be prepared to admit that architecture inheres in proportional relation. The lecturer, therefore, for the time being, confined himself to the elucidation of that section of the science of proportion which relates to architecture.

The science of proportion does not deal with absolute but relative magnitudes. It cannot be affirmed that any one dimension is more beautiful than another, but we are competent to pronounce whether anything consisting in the ratio or magnitudes of 1:2 is more agreeable to sense than an instance of the same kind inhering in the ratio of 1:9. The consideration of the science of proportion, therefore, resolves itself into the consideration of the characteristics of ratios. Now, the infinitude of ratios are the numerical expressions for all the possible relations in which two quantities may be to each other. Mr. Thomas demonstrated many years since, and in these pages, that the limits of ratios may be expressed as 1:1 and 0:1, and that between these extremes of equality and disparity all other ratios lie. These limits, then, place the entire scale of ratios within the range of our mental inspection and grasp; we may study it, analyse it, and reason upon it. In the accompanying scale, the Calculus of Ratios, as the lecturer terms it, it is divided into twenty-fourths, but it may be divided into any number of degrees at will. Every ratio has its immutable position in the scale.

##### Calculus of Ratios.

21:24::1:1	1
23:24::1:1	1
22:24::1:1	1
21:24::1:1	1
20:24::1:1	1
19:24::1:1	1
18:24::1:1	1
17:24::1:1	1
16:24::1:1	1
15:24::1:1	1
14:24::1:1	1
13:24::1:1	1
12:24::1:2	1
11:24::1:2	1
10:24::1:2	1
9:24::1:2	1
8:24::1:3	1
7:24::1:3	1
6:24::1:4	1
5:24::1:4	1
4:24::1:6	1
3:24::1:8	1
2:24::1:12	1
1:24::1:24	1
0:24::0:1	0
24:24::0:1	0

The simplest division of the scale is into two equal parts, and the next in simplicity is into three. The lecturer chose the latter, because it is conformable to the division of cosmic phenomena into excessive, mean or moderate, and defective, manifestations; because it yields a central zone or compass of moderate ratios, flanked by two zones of extreme ratios, each compass or zone being equal to a third of the entire scale. This tripartite division was probably adopted by the ancients. It yields, as it were, a torrid, a temperate, and a frigid zone of ratios. The scale as it stands, without any such general division, has no significance; it is merely a table of ratios.

The lecturer then proceeded to inquire whether there was any evidence in human experience which would induce a preference for any set of ratios in the scale thus divided into three equal zones? He demonstrated that there was none in favour of the ratios contained in the two extreme zones of the scale, but that there was overwhelming testimony in favour of those comprised within the middle third, those lying within the limits of 1:3 and 2:3,—those lying within the compass or zone of moderation.

He then drew attention to the doctrine of the mean, which is, in its general sense, one of our most ancient and best attested scientific and mental possessions. Volumes might be filled



with testimonies to its truth. The principle of the mean, in virtue of its importance and universal applicability, has been rightly entitled the Golden and the Immutable. There are very few persons, however, who, when they exhort others to observe the mean, or medium, in all things, are in the slightest degree conscious that they are using a mathematical expression for rectitude,—for the Good and the Beautiful.

A number of facts were then marshalled as testimonies in favour of the doctrine of the mean, being the mathematical doctrine of the proportions of well-being and of excellence in nature and in art. There could be little doubt that the Greeks had worked out this doctrine in its entirety. The mean was the central and immutable principle of that science of proportion which underlies all the harmonies of nature, of that science which the lecturer had set himself to recover and to place on its ancient pedestal. Aristotle had applied this mathematical principle to ethics; and if the Greeks applied it to ethics, we may be certain that they must have known that it was applicable to art. Dryden, Hogarth, the Père Bouffier, and Sir Joshua Reynolds had all discerned, in a hazy way, that the doctrine was applicable to art; Dryden even said that "there was a mean and a certain measure in which the good and the beautiful consist, and out of which they never can depart."

Mr. Thomas then entered upon a more minute analysis of the compass of mean or moderate ratios, and in doing so mentioned what he believed had never been noticed before, a remarkable point of contact between formative and musical art, viz, that the central zone of moderate ratios was comprised within the compass of an octave, or within the ratios of 1:3 and 2:3, which are to each other in the ratio of two contiguous octaves or that of 1:2. The compass of an octave, it would be discerned, occupied precisely the middle zone of the infinity of ratios; this was doubtless the reason why it had been adopted as the unit of the musical scale. In this zone of ratios lay those in which he might almost say the harmony of the universe consists. He also pointed out that 1:2 is the mean of the infinity of ratios; it was, therefore, to be regarded as the most excellent and beautiful ratio. These important facts, from their scientific accuracy, render us altogether independent of ancient practice.

Art, like Nature, when rightly directed, tried to steer a middle course between extremes. The two extremes of ratio were equality and greatest difference (1:1 and 0:1). Art, therefore, avoided the regular geometrical figures, because these contained too great an amount of equality, and also, for an opposite reason, the eccentricity of the extremely elliptical figures, whose ratios were of too wide disparity. Even the moderately elliptical figures possessed too great an amount of regularity for a refined taste. There was, however, another order of figures, having *contrariety* in their proportions, viz, the ovoids, or egg shapes. These in their mean proportions had ever been regarded as the very symbols of good taste. This was the reason why the vase became so important an art object amongst the Greeks; the abstract science of proportion might be rigorously applied to their construction. The ovoids were of two kinds,—the upright vase forms and the oblate bowl forms. These forms might be described mechanically from three foci. If the complementary forms of the two species were brought into juxtaposition, they became the foils or contrasts to each other. The proportions of the complementary forms depended upon precisely the same principle as the complementary colours. Mr. Thomas gave the rule for finding the complementary of any ratio. The application of the science of proportion to the ovoids linked them with architecture; for in the ovoids there were two main divisions, which might be differentiated *inter se, ad infinitum*, just as the proportions of a pediment might be differentiated with reference to the columnar portion of the portico. Three diagrams of Grecian porticoes were given, which were founded upon the ratios of the three moderately-proportioned ovoids, on the ratios 1:3, 1:2, and 2:3:1:1, and which, by the necessary conditions of their evolution from these ratios, produced the hexastyle, octostyle, and decastyle colonnades, with perfectly consistent proportional features. It should be recollected that 1:3 and 1:1½ were, at the same time that they were the limits of the compass of moderation, also the first terms of

the two extremes. The ratios 1:1½ and 1:2½ might, therefore, be esteemed as the limits of the most excellent and beautiful proportions. But whether the ovoids were adopted as keys or not, the calculus of ratio left us free to apply moderate proportions without any such restraints.

It was a fallacy to suppose that the sole end of art, any more than that of nature, was the presentation of the beautiful. The grand consisted in proportional characteristics quite distinct from those of the beautiful. There was a complete muddle in many minds in respect to art questions: with such persons all the different art aims were confounded under the heading of "The Beautiful." A great many art failures were due to men's inability to divide the truth rightly. They, therefore, vainly endeavoured to reconcile incompatible aims.

Mr. Cave Thomas said his lecture might appear bold when considered with reference to the variety of proportions which were possible in nature and in art, but he reminded his audience that whatever visible variety was possible in nature was due to the endless permutations and combinations of the ratios which might be conceived as lying within the limits of 1:1 and 0:1, of that scale which he had symbolised in the diagram. At all events, he had, by a rigorous process of reasoning, demonstrated that in architecture, as in everything else, the principle of moderation was the safest and the best, and not only this, but that the compass of moderate proportions was the compass of the beautiful.

#### ENGLISH PARISH CHURCHES.

At the Kensington Vestry-hall, on the 9th inst., Mr. J. T. Micklethwaite, F.S.A., delivered an interesting lecture on "English Parish Churches," to a crowded audience, principally composed of ladies. The lecture was one of a series given in support of the Society for the Protection of Ancient Buildings. The chair was taken by Mr. Reginald Stuart Poole, of the British Museum.

Mr. Micklethwaite said that he had come there that day partly to describe the history of their old parish churches, and partly to plead their cause. He claimed for them that they were the most interesting relics of all antiquities that they had, more so than pre-historic antiquities like Stonehenge, which they simply had as a dead relic. Churches, on the other hand, were still what they were from the beginning,—places where people went for worship and where they had attended for hundreds of years. They were, he considered, even more interesting than cathedral and abbey churches, because they were more especially the outcome of the people, and, unlike cathedral and abbey churches, they frequently were small but rich corporations. They were actually churches in traditions than cathedrals or abbey churches, the history of which, as they knew, was comparatively of a recent date. Many of the cathedrals dated from the eleventh or twelfth century, but the introduction of Christianity, as it was called, dated from the beginning of the sixth century. When Augustine and his monks came from Rome on a mission to this country, Christianity had been known here before. The bishops he brought with him were nearly all monks; they were either foreigners, or had been educated by foreigners; consequently they took their ideas from Italian sources, which Augustine and his companions introduced. The churches which Augustine founded at Canterbury had a distinct type about them, they being basilican in their plan. At Brixworth, too, he founded a church in 680; it was not a church of the first class, but of the second. Another was built at Dover about that time, which was quite different from the ordinary parish churches.

At the time of the withdrawal of the Romans, all the more civilised Britons were Christians, as Britain was a Christian country, and, although it had been denied, yet he (the lecturer) believed that the Christians were then in a majority. As to the sort of churches they used, in this country they had nothing to date from before coming to the Saxons but the Irish Church, which was a very close connexion indeed. In Ireland the people, long after the English had settled down, began to build churches, which were very peculiar in their way, and quite different from the Italian tradition, and they might fairly assume that these churches, if not actually contemporary with British churches, closely resembled them, and

came from the same source. When the Saxons began to build churches for their own use, those churches consisted of a small square, a narrow arch very little more than a door, and a small undivided nave without any aisles. A comparison of the buildings led one not less to doubt that their parish churches were not derived from the Italian traditions, but from the ancient British. There was another matter,—the ancient date of the division into parishes,—which showed the extreme antiquity of the parish church plans. There was absolutely no record to be found of the division of the parishes. Until the eighteenth century such a thing as an absolutely new parish church was very rare indeed. The sites might possibly be older even than Christianity. When Canute became a Christian they were not told that he built churches, but that he rebuilt those which he and his father had previously destroyed, and he (the lecturer) believed that many Saxon churches which had come down to them belonged to that rebuilding.

As the parishes got larger and there were more people, the churches were not found big enough, and apparently, about the beginning of the eleventh century, there was built a mixed type of church. At that time transcripts had come in, and a fresh start was made. Nearly every church in the land was more or less rebuilt, some of them entirely so, and a new tradition was introduced; but the parish churches kept their old traditions, and did not alter their plans. The lecturer then proceeded to refer to the parish church in his native town, Wakefield, which, he said, had gone through a number of changes, it being from time to time enlarged. He described in detail the number of changes which had been introduced into it, and stated that in the end it was completely remodelled. There were pieces, he said, to be traced of every stage of the changes which it had undergone. What had happened at Wakefield parish church had occurred more or less to every parish church in the land; in fact, he might say that this had been done in nine cases out of ten.

In regard to the fittings of Celtic churches, they were arranged not for choruses, but for masses; there was gradually growing up the custom not for regular, but for occasional choral services, which caused the parish churches to imitate other churches; consequently, elements were drawn from the abbeys and cathedrals. One of the elements introduced was the elongation of the chancel, and the number of the clergy was increased. At funerals choirs were engaged, and many of the singers made a living in that way, this fact causing increased improvements to be made to the chancel. In the fifteenth century, in many of the parish churches choral service was introduced. The stalls in the parish churches were just exactly the same as in cathedrals, but in the parish churches there was only one row, while in the cathedrals there were three rows. Then odd alterations were stuck everywhere, because at the end of the thirteenth century the custom of chantries came in, services being held for the benefit of certain deceased people, some families having performed perpetual chantry. He was sorry to say that a great many chantries had been destroyed during the last few years. They were surrounded by a little chapel, which served a double purpose. The people who founded the little chapel were in the habit of using it as their private pew, and that arrangement affected the form of the chantry, it being entirely for their accommodation. In some instances chantries, or something very like them, had belonged to guilds, and occasionally an arrangement was made for the whole of the guild to be present. At a parish near Oxford one trade guild had the government of the town in its hands, and it had a very large chantry at the church. Up to the seventeenth century sermons were not the ordinary thing in parish churches, consequently there was no need of pulpits. The more ordinary custom was for the preaching to take place out of doors, so that the large congregations might hear. In respect to images and lights, they were subjects of interest. An image would be private, and kept up by a guild simply as a bond of union, a light being burnt in front of the image. Guilds were a very essential part of the parish churches, and by their influence funds were raised.

They now came to a great change in parish churches, viz, that which was brought about at the era of the Reformation. It did not, however, affect parish churches immediately, and very little alteration was made in them; but in the time of Edward VI.



the government got into the hands of a set of extraordinary adventurers, who amused themselves by scrambling for what they could get. All through history at that time it was one of plunder, but not so much mischief was done on religious grounds, the principal thing being plunder. Altogether, however, the churches then suffered very much indeed. The time of Queen Mary did not make much difference in this respect. In Queen Elizabeth's reign matters improved, there being not so much plundering, and an entire change subsequently took place on the part of those who had the management of the churches. Puritan feeling became strong, and the taste for sermons grew up. Matters became a little more settled about the year 1620, when there was a strong revival of church building. Then came the Civil Wars, and the Puritan supremacy in churches was altered. Architecturally, nothing was gained, but a great deal was lost. At the Restoration, too, nothing much was gained. Of course, there was a great deal of preaching, and this brought about the introduction of galleries into churches, they being by no means bad things. Some of the churches (especially one at Halifax) were wonderfully fitted up with galleries at the early part of the seventeenth century, at which time they found the elements of new churches being built. With the Great Fire of London there was brought about a great change. Sir Christopher Wren carried out an entirely new system of church building. Then came the Georgian style, which existed until the first half of the present century, when there came in a strong movement for the studying of old churches and of imitating them, this being followed by another movement having the object of putting churches back to their old condition. He wished to guard himself as to what he might say in respect to the practice of restoration, but in what they did they should not hinder the history of the church. Even the old pews, like tanks, of the Georgian period should not be removed without caution being exercised. Their parish churches had passed through times both good and evil. He pleaded their cause, though many, he was sorry to say, had been destroyed, but, as in the old story, those that remained were still of the same value as of old, not because they were worthless, but because they were priceless.

#### THE PEDIMENT SCULPTURES OF EG.N.A.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A LECTURE ON "The Pediment Sculptures of *Ægina*, and their Composition" was delivered on the 8th inst., by Professor Baldwin Brown, to the members of the Edinburgh Architectural Association. Mr. John M'Lachlan, the president of the Association, occupied the chair. In the course of his lecture Professor Baldwin Brown pointed out that the works under discussion were discovered among the ruins of the temple dedicated to the goddess *Athene*, which was demolished by an earthquake. The discovery was made by a party of explorers in the year 1811. The fragments were carefully collected, and when they were subjected to close examination it was found that five figures of the eastern pediment could be totally restored, and ten of the western pediment. The work of placing the fragments together was entrusted to Martin Vagne, who satisfactorily performed at Rome the duty confided to him. The figures were also executed in models of nearly life-size, and these were at present in the Museum of Munich. Professor Baldwin Brown then described the western pediment, an excellent model of which he exhibited. The height of the pediment, according to Cookrell, he stated, was 5 ft. 6 in., inside measurement; the whole length, from corner to corner, was 41 ft.; the depth was 2 ft. 3 in.; and from the topmost step of the platform, on which the temple stood, an elevation of 23 ft. was reached. Regarding the figures represented on the pediment, they were supposed to exhibit a contest for the body of *Achilles*. In the middle, as if guarding the fallen hero, stood the goddess *Athene*. On each side were prominent heroes of the Greeks, acting as spearmen and warriors, while at each end of the pediment lay a wounded warrior. These statues, the lecturer said, were amongst the most interesting of the works of ancient art which were left to us. They belonged to the period shortly before the outburst of the artistic activity of the Greeks, and as examples

of the archaic manner no better specimens were to be found. Proceeding to speak of the dubiety which existed as to whether the figures were embellished with coloring, the lecturer showed that, on account of parts of the surface of the figures being corroded, and other portions being perfectly preserved, there was every reason to believe that the figures had borne coloring. He then alluded to the position of the statues, and pointed out the remarkable manner in which they were supported. The figures were let into small pilinths, which were afterwards filled in with lead. In connexion with the manner in which the figures were supported, the lecturer, as an instance, drew attention to the position of a statue in a kneeling position. The lower limb, although nearly touching the bed of the pediment, was unsupported except at the joining of the toe with the base of the pediment, and the foremost limb was fixed into the latter, by the usual bronze joining, from the sole of the foot.

#### PROMOTION OF DISTRICT SURVEYORS. ELECTIONS.

At a meeting of the Metropolitan Board of Works, on the 10th inst., the Building Act Committee reported that, in accordance with a resolution of the Board, come to a fortnight previously (see *Builder*, p. 271, ante), a circular had been sent to all the district surveyors of the metropolis, inquiring if they desired to become candidates for either of the two vacant surveyorships of West Wandsworth and East Wandsworth with Tooting Gravenev. Twenty-seven replies had been received, twenty-three district surveyors stating that they had no desire to change their offices, while four, viz., Mr. G. Atchison (district surveyor of Woolwich), Mr. R. Rowland Plumb (South Islington), Mr. J. B. Redman (Tower Liberty), and Mr. T. Roger Smith (St. Saviour's, Southwark, and northern part of Lambeth), offered themselves as candidates for the vacancies. The usual voluminous resolutions as to the conditions of appointment (with an extra one to the effect that the successful candidates for the vacancies should at once resign the district surveyorships they at present held) having been carried, the Board proceeded to the election, the voting being as follows:—

##### District of West Wandsworth.

	1st	2nd	3rd	4th
	Vote.	Vote.	Vote.	Vote.
Atchison.....	6*	13	7	—
Plumb.....	6*	—	—	—
Redman.....	8	5	—	—
Smith.....	28	28	28	Elected.

##### District of East Wandsworth and Tooting Gravenev.

	1st	2nd	3rd
	Vote.	Vote.	Vote.
Atchison.....	23	28	Elected.
Plumb.....	7	—	—
Redman.....	8	8	—

The promotion of Messrs. T. Roger Smith and Atchison to these districts thus causes vacancies in the districts in which they have hitherto served.

#### TRADE-MARKS, ANCIENT AND MODERN.

A COUNTRY-COURT JUDGE, Mr. J. T. Abdy, D.C.L., delivered an interesting lecture recently on this subject at Great Baddow, Essex, and a report of it appears in the *Chelmsford Chronicle*. The lecturer said he had to speak of certain marks which in old times and in the present day were affixed upon articles for sale in order to mark the excellence of the goods and the respectability and standing of the person who sold them, and he proposed to give an historical account of trade-marks, and to speak of the legal regulations which had been introduced into this country for the purpose of establishing them as matters of necessity. The subject was of considerable moment as showing as a part of the history of our commercial transactions, and it was also important, because it showed that, in old times certain persons had attained a celebrity in their particular line as merchants and traders, and that they claimed to make known that reputation by special signs and marks. As to the importance of the subject, the late Mr. R. Buck said in 1862 in a Committee of the House of Commons, when a man had manufactured an

article for which he had obtained a reputation he wished that it should be known as his manufacture, and therefore not only put his name to the article, but also affixed his sign, mark, or symbol. Before that committee a letter was read, in which a Prussian manufacturer offered to make an article of hardware with any Sheffield mark the buyer pleased, and to put the article in a wrapper precisely like that of any Sheffield manufacturer. This Prussian manufacturer made a bad article, affixed to it an English trade-mark, and put a high price upon it, and then he made a good article, affirmed it to be of his own make, put his own name upon it; and then exhibited the two together, and said, "Here you have the English article, a most inferior thing; there you have the Prussian article, a most superior one, and now you see that we can compete with the English in this particular line." The early history of trade-marks was involved in obscurity, but it appeared that the marks were in general use for about 300 years,—that was from about 1300 to 1600. The first specimens were simple in form and of a somewhat religious character, but after a time this simple and religious character was departed from, and then the marks became very complicated, almost like monograms. Their forms depended entirely upon the fancy of the merchants, there being no fixed rules for them. Of course, care was taken to avoid copying a neighbour's mark; but they were all alike in one respect,—namely, in having a precise, definite shape, and they were used by any trader of any standing in a city. Undoubtedly the marks were hereditary, and in some cases different branches of a family retained the same mark, with a slight alteration to prevent mistakes. Some had supposed that the marks were used on shields by those who had no hereditary coat of arms; but in the sixteenth century many great merchants had coats of arms, and it was not uncommon to find the trade mark and the family mark on the same escheon. In old times if merchants gave money towards the building or restoration of churches, their marks were placed in the windows, sometimes side by side with the coats of arms of noble squires, promoters of the same work. This was referred to in "Piers Plowman's Creed." A book of entries found at Yarmouth showed that in 1577 it was intended to borrow 1,000*l.* from the City of London, and that several of the townsmen, instead of writing their names, appended their trade-marks to the entry. The records of most corporate towns threw some light upon this subject, and showed that trade-marks were looked upon as matters of importance. On the Continent, merchants' marks were in use at a very early date, nor was their use given up until a later date than was the case in England. Masons' marks were very much like merchants' marks, and they were still to be found in English and Continental churches. They were put upon the stones, not for the purpose of showing in what order the stones were to come, but to show who did that particular work, to show the excellence of the work, and to establish the man's reputation. A book by Mr. Hunter mentioned trade-marks as an institution of Sheffield. It showed that a jury of cutlers had to assign marks to different manufacturers wherewith to distinguish their respective wares, and the rules governing the granting of the marks were drawn up in a more formal manner during the reign of Elizabeth. It was provided that "no person is to strike any mark upon his wares but that which is assigned to him in the court, under a penalty of 10*s.*" The cutlers of London exercised the power of giving trade-marks, which could not be used or appropriated without a special order of the company; and from the charters of several of our old City companies it was clear that such powers were not only claimed, but pretty generally exercised, with advantage to the companies, to the country generally, and to commerce. The Grocers, the Drapers, the Goldsmiths, the Skinners, and other companies seemed to have inspected articles exhibited for sale, to have punished fraudulent sellers, and, in short, to have acted as general licensees of the trades they presided over. Therefore, merchants' marks and trade-marks were more than mere symbols of ownership: they were certificates and testimonials to character. We must not wonder that special privileges were granted to merchants and traders in those days, for the internal trade of Europe was then carried on at great peril to the merchants, and but for the protection afforded them by the corporate towns

\* There being a "tie" here, it was put to the vote which of the two names should be returned, the result being that Mr. Atchison received sixteen votes and Mr. Plumb five.



and corporate bodies, commercial enterprise would, it was not too much to say, have remained for centuries in the depth of misery and despondency. In the ninth and tenth centuries there were scarcely any manufacturers in this country, but at length the want of internal trade was met by the establishment of staples and fairs, and so important was the trade done in this way that our statute-book was full of regulations for staples and fairs. It therefore became necessary to protect the dealer, and trade-marks were used almost as a certificate of the merchant's character and the genuineness of his goods. A writer in 1570 showed that these marks were presumptive evidence of property, and in some cases the marks on goods were held to be decisive in questions of ownership or possession. Where the mark was obliterated, on proof being given that it had ever existed, that was sufficient to warrant restitution in case of wrongful detention of goods. The marks were at that time also of use in partnership disputes. Every guild had its own sign or mark, which not only served to distinguish the guild and every member of it, but was also a valuable means of protecting the guilds, their members, and private merchants as well, from illegal societies and unlicensed traders. With regard to legislation on the subject, a statute was passed in the time of Elizabeth for the preservation and establishment of trade-marks, and the last statute affecting the matter was passed last year or the year before; but it was only within the last twenty-five years that a genuine statute had been passed. The 25th & 26th Victoria, chap. 88, gave the modern legal definition of a trade-mark as any name, signature, word, letter, device, emblem, figure, sign, seal, stamp, diagram, or other mark of any description which a person might put on his goods. It gave various remedies for the offences which might be committed by a person against the owner of a trade-mark; it established as property a trade-mark to a person who claimed to have it as his own; and it made an offence under the Act a misdemeanour. The 38th & 39th Victoria, chap. 91, which was passed in 1875, provided that there should be a registration of trade-marks, and that a person should not be entitled to institute any proceeding to prevent the infringement of any trade-mark unless the trade-mark had been registered in pursuance of the Act.

## BUILDING PATENTS.\*

### APPLICATIONS FOR LETTERS PATENT.

769. T. A. Weston, Stamford, U.S.A. Attaching door-knobs to spindles. (Com. by B. H. Lockwood, Stamford, U.S.A.) Feb. 17, 1882.  
 770. E. Latham, Birkenhead. Bolt fastenings for doors and windows. Feb. 17, 1882.  
 781. A. Ashwell, West Dulwich. Indicating door-fastenings. Feb. 17, 1882.  
 786. J. M. Lamb, London. Ventilators and cowls. Feb. 18, 1882.  
 810. A. S. & C. Baxton and F. O. Ross, Hammsmith. Ventilating valve for preventing bursting of pipes during frost. Feb. 20, 1882.  
 830. C. Baily, Leeds. Baths. Feb. 21, 1882.  
 847. W. Meakin, London. Sash pulley. Feb. 21, 1882.  
 850. J. Eversard, Birmingham. Apparatus for raising and lowering blinds. Feb. 20, 1882.  
 861. H. J. Haddon, Kensington. Closet valves. (Com. by W. Ridiger, Berlin.) Feb. 22, 1882.  
 875. J. Slater and R. Pollock, Edinburgh. Shoring or supporting buildings in course of alteration, &c. Feb. 23, 1882.  
 888. H. Sutcliffe, Halifax. Water-closets, &c. Feb. 23, 1882.  
 889. J. C. Mewburn, London. Water-closets and water supply therefor. (Com. by J. E. Boyle, Brooklyn, and H. Haber, New York, U.S.A.) Feb. 23, 1882.  
 893. A. Jamieson, Blantyre. Apparatus for mixing concrete. Feb. 24, 1882.  
 895. C. Hibbs, Paiscow. Decorative coverings for walls, ceilings, &c. Feb. 24, 1882.  
 911. J. Parker, Kilmaronock. Manufacture of bricks, tiles, &c. Feb. 25, 1882.  
 914. S. S. Hellyer, London. Water-closets, urinals, &c. Feb. 25, 1882.  
 918. H. J. Haddon, Kensington. Ventilators. (Com. by P. Mihan, Massachusetts, U.S.A.) Feb. 25, 1882.  
 925. W. H. Lascelles, London. Earth closets. Feb. 25, 1882.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street. We have been compelled to shorten the list sent: space fails.

934. J. Carpenter, Southampton. Apparatus for opening, closing, &c., window sash-frames. Feb. 25, 1882.  
 950. W. P. Bonwick, Shepherd's-bush. Window and other fastenings. Feb. 27, 1882.  
 956. C. D. Abel, London. Ventilating apparatus. (Com. by E. Oehlmann, Berlin.) Feb. 27, 1882.  
 966. J. T. B. Bennett, Aston. Spring hinges for doors, &c. Feb. 23, 1882.  
 967. F. Wirth, Frankfurt. Stoves for warming rooms, &c. (Com. by E. Schöneberg, Bockenheim, Germany.) Feb. 28, 1882.  
 975. J. R. Nottingham, Washington, U.S.A. Compositions for manufacture of artificial stone, &c. (Com. by A. Pelletier, Washington, U.S.A.) (Com. Spec.) Feb. 28, 1882.  
 980. T. Le Poidevin, Guernsey. Machinery for moulding bricks and tiles. Feb. 28, 1882.  
 999. G. Wilson, New-cross. Fastening scaffold-poles. March 2, 1882.  
 1,015. W. Brass, jun., London. Reflecting pavement and other lights. March 2, 1882.

### ABRIDGMENTS OF SPECIFICATIONS

Published during the week ending February 25, 1882.  
 2,857. K. W. A. Leverkus, Manchester. Pumps, ventilators, &c.

Instead of the ordinary ladle of centrifugal pumps or ventilators, one of a varying Archimedean spiral form is used, which causes the water or air to leave the wheel of the pump in a tangential direction. A diffuser is also used, consisting of a canal the area of which is gradually increased. This surrounds the leading casing in one or more turns, and delivers the water at a greater speed. A pear-shaped valve, which is placed in the inlet-pipe, is used to reduce the volume of power. Many modifications are shown in fifty-eight figures in the drawings. June 30, 1881. Price 1s. 4d.

2,969. E. Aldons, Peckham. Apparatus for ventilating buildings.

There are an outer and an inner shaft leading from the top to the bottom of the building. The inner shaft is closed at the bottom, and has a fixed cowl on the top, with four openings, to catch the wind from any quarter. Just above the bottom there are openings in the outer shaft. The wind is thus carried into the outer shaft below all the inlet tubes, and the up-draft carries away a. the foul air, &c. July 6, 1881. Price 6d.

3,003. G. Furness and J. Robertshaw, Manchester. Taps.

Instead of washers of leather, &c., a plug of lignum vitae is used. July 8, 1881. Price 6d.

3,020. W. Howitt, Ilford. Sash-bars for horizontal buildings.

A semi-cylindrical sheet of metal is attached to the lower edge of a piece of wood, on the upper edge of which are other pieces of metal, which overlap the lower piece. Each square of glass is inserted edgewise between the pieces forming the casing and the lower piece. The overlapping portion is pressed over the edge of the glass, and holds it firmly in position. July 9, 1881. Price 6d.

3,067. J. Gilmore, Norwood, and W. E. Clark, Peckham. Inducing or accelerating an outward draught from chimneys, &c.

A series of rings are mounted one over another on the top of the chimney, which are tapered from the inner periphery outwards. The intervals between the rings are thus circular wedge-shaped apertures, narrowing towards the centre, thereby increasing the velocity of the wind blowing across the mouth of the chimney. July 13, 1881. Price 6d.

3,079. J. Comforth and E. T. Barton, Birmingham. Open firegrates and cooking-ranges for stoves.

The bottom bars of these grates are tubular, and open into channels at the back, which rise to the height of the front of the grate, where they eject a current of hot air into the smoke and gases rising from the fire, thereby increasing the heat and consuming the smoke. The products of combustion then pass out at the back by a horizontal passage to a vertical flue, which opens into a chamber in which an oven or cooking-range is fixed. July 14, 1881. Price 6d.

3,183. W. Cunningham and W. Cunningham, jun., London. Decoration of paper-hangings, &c.

It is a mixture of powdered mica, with brocade, bronze powder, powdered gold-leaf, &c., which is, shaken, beaten, or blown on the surface of the paper previously covered with size. July 21, 1881. Price 2d.

3,193. J. W. Wade and F. W. Duffy, Liverpool. Fastener for cords and ropes.

This is specially applicable to the cords of blocks, &c. It consists of a pin and a serrated quadrant, which is pivoted, so that it will hold the cord between its serrated edge and the pin. (Pro. Pro.) July 22, 1881. Price 2d.

Published during the week ending March 4, 1882.

2,820. H. Fabian, Brith. Floor-cramp, for cramping floor-boards.

A toothed sliding rack gears into a worm on a shaft borne on the frame. There is an internal ratchet-wheel fixed in the shaft, which actuates the worm. The ratchet-wheel is actuated by a lever with pawls, and the sliding rack is pushed forward, jamming the floor-boards together. June 28, 1881. Price 4d.

3,114. W. R. Lake, London. Roofs for houses, &c.

This roofing is constructed of lattice-work, which is coated with cement or hydraulic lime in a semi-liquid state. This afterwards becomes hard, and the roof is made. (Com. by J. Schöder & C. Folsch, Vienna.) July 16, 1881. Price 4d.

3,170. R. R. Gibbs, Liverpool. Apparatus for cooling, cleansing, and purifying air.

A frame is placed in the window, in which are a number of horizontal troughs. Water from a cistern is allowed to flow into the upper trough, whence it overflows into the next lower one, thence to the next, and so on until it reaches the bottom, whence it is conveyed to the sewer. The troughs are at such a distance apart that the water contained in one is a little below the bottom of the next trough above. The air, therefore, entering the room has to pass through the falling water and over the surface of the water in the troughs, and is cooled, cleansed, and purified. July 21, 1881. Price 6d.

3,260. C. D. Abel, London. Gaseliers, &c.

Instead of the usual balance-weights in connection with sliding gaseliers, a spring drum or barrel is used, on which the casings are wound. (Com. by Messrs. Keyling & Thomas, Berlin.) (Pro. Pro.) July 26, 1881. Price 2d.

## NOTES FROM BRISTOL.

THE Bristol Town Council have resolved to sell their Radland tram-line to the Bristol Tramway Company for £8,000, reserving to themselves the right of re-purchase at the end of twenty-one years. The line is one mile and three-quarters in length, and will as soon as possible be replaced by double lines of steel instead of the old single line of iron rails. There are about thirteen miles of tram-line in Bristol, all worked by one company.

Messrs. Hatherly (Bristol) are rebuilding the extensive premises of Messrs. Jefferies, Cayange House, Redcliff, destroyed by fire several months ago.

At a meeting of the commissioners appointed to consider the question of church extension in Bristol, a very large expenditure was talked of for new places of worship. The recommendation of the commissioners was stated by the Bishop to include the building of six new churches; one in the north of the parish of St. Andrew, which had a population of 8,340 (this district a few years ago was nothing but fields); a new church in St. Barnabas, a parish with a population of 10,232 (this is the new building in Newfoundland-gardens, the foundation-stone of which was laid a few days before); a new church at Lawrence Hill in the parish of Holy Trinity, St. Philip's, where there was a population of 13,450; another church at Barton Hill, with a population of 9,851; a fifth in St. Silas, which had a population of 6,700; and the sixth at Ashton Gate, Bedminster, a parish with a population of 20,847. They also recommended that St. Matthew's, Moorfields, should be enlarged by the addition of a south aisle, and that sites be secured for new churches in St. Mark's, Easton; Windmill Hill, Bedminster; and Downside, Bedminster. The cost of the extension scheme is estimated to be as follows: Sites, 7,000l.; three mission-chapels (reckoned exclusive of site at 4l. per seat), 3,200l.; grant in aid of others, 800l.; cost of six new churches and enlargement of a seventh, exclusive of sites, 18,000l. (it is believed that the churches could be built in a severely simple style of architecture at 5l. per seat); endowment of six ecclesiastical districts, 18,000l.; making a total of 47,000l. present expenditure, and "an additional annual" expenditure by the clergy of 850l.

## WYMONDHAM GRAMMAR SCHOOL.

THESE buildings, which have been opened recently, are the result of a scheme drawn up by the local governors, and approved by the Charity Commissioners, for providing a new Grammar School and head-master's house for this foundation, to supersede the old buildings. Competition designs for the buildings, &c., were invited in 1878, and those of Mr. Alfred Smith, architect, Mitcheldean, Gloucester, were accepted, and the works have been executed under the supervision of the architect and Mr. Thos. Stafford, the clerk of works. The new buildings, which are Early English in style, have been erected on a well-elevated site near Wyomndham, and contain large schoolroom, class-rooms, dining-hall, day and night rooms, dormitories, sick-rooms, and out-offices, to which are attached large play-grounds and cricket-field. The head-master's house, which adjoins the school, contains drawing and dining rooms, study, assistant-master's rooms, bath-rooms, bedrooms, and laundry, &c. The external walls are built with Bulwell stone, rock faced and pointed, with white brick quoins and Bath stone dressings. The roofs are covered with Bangor countess slates and red terra-cotta ridge tiles. The interiors of school and class-rooms are constructed with open boarded roofs; a wood dado is provided, being, together with



all internal wood fittings, of pitch pine, varnished. Electric bells have been fitted throughout the buildings. The contractor is Mr. Thos. McCulloch, Balwell, Nottingham.

#### THE "MODEL" BY-LAWS.

REFERRING to the recent discussion on uniformity of building regulations, in which the "model" By-laws were repeatedly mentioned, especially those relating to drains, drain ventilation, and connexion to sewers, it may be of interest to some to learn that the "model" requirements are now in operation in a great number of districts, and that in order to make them more clear and intelligible, some Local Boards have had them illustrated. The Sevenoaks Local Board, for example, with the assistance of Mr. Rogers Field and Mr. Hennell, who have been engaged on the sewerage of the district, have issued a sheet of illustrations of their new building-regulations, which are based upon the Government "model." From this sheet it will be seen that direct communication between the house-drains and the sewers has in every case to be broken, and that at least two openings are to be provided for drain-ventilation, such openings being as near to the lowest and highest parts of the drains respectively as possible. The diagram, which also shows some other useful requirements, indicates how the regulations are applicable under varying circumstances of house-building, and the paper which accompanies the diagram contains in a concise form most of the requirements as to drains, as well as certain desirable suggestions. Other Boards should follow the example.

#### BOYLE'S SYSTEM OF VENTILATION AT THE LONDON CUSTOM HOUSE.

SIR,—It was with some surprise and no small bewilderment that we read in your issue of last week a letter signed "John P. Seddon," in which that gentleman, without producing the slightest proof beyond his own statement, pronounces the application of our system of ventilation to the Custom House to be not the success it has been represented to be.

As the statement is one affecting our credit, we cannot allow it to pass unchallenged, and in order to show that Mr. Seddon's visit to the Custom House and his remarks thereon were not so entirely disinterested as your readers might suppose, we beg to state that he has consistently shown himself for many years to be strongly antagonistic to our system of ventilation, giving expression to this antagonism on every possible occasion. The reason for this is not far to seek, Mr. Seddon having these six years identified himself with a ventilating cowl known as the Banner Cowl, which he has advocated in the strongest and most laudatory manner in person and through the press, and though this cowl, being a rotary one, is now practically out of the market, he still maintains, in spite of all that has been shown to the contrary, that it is the most superior cowl in existence, and that all other cowls are worthless compared to it.

Doubtless Mr. Seddon has good reasons for this unflinching partisanship, and it was in this belief that we, finding his name in the list of judges in the ventilation section at the Sanitary Exhibition lately held at South Kensington, formally protested against his acting in that capacity, as, from his expressed opinions, it would be impossible for him to give an impartial judgment. Evidently Mr. Seddon has not forgotten the action we took in that matter.

Your correspondent cannot be a very careful reader of his *Builder* or he would have found therein a full account of the experiments published, as also in over fifty of the leading trade and scientific journals and daily papers of the metropolis, some time before it appeared in *Industry*, which journal he refers to in such a manner as to lead one to suppose that it only had taken notice of the experiments. Mr. Seddon does not state why he has postponed his criticisms of our system until this date,—a year and a half after the completion of the work,—but it may perhaps be not irrelevant to mention that our system of ventilation, just applied to the Council Chamber of the Guildhall, with a guarantee from us of complete success, will shortly be put to the specified tests, which are of a most stringent nature; and that the system of ventilation supplanted by ours was the one which Mr. Seddon has so strongly advocated,

and in the development of which he has displayed such a deep interest.

When we were called in by her Majesty's Board of Works to ventilate the Custom House we were informed that we would be required to give a guarantee that the ventilation would be satisfactory, and, in accordance with our usual custom, this guarantee was given. The result has already been published in your columns, and we were suitably rewarded by the Board of Works. When the matter was brought up before the Royal Institute of British Architects the most favourable opinions were expressed by those members who had personally examined the system and taken the opinions of the occupants of the Long Room.

With regard to the air-inlets provided, they were the ordinary vertical tubes, and every architect and builder knows that, unless some means are employed for warming the air before entering a building, there is always a liability of a draught being occasionally felt from them; and if Mr. Seddon has derived, or can derive, a method of admitting cold air in winter into a heated building without some of the occupants complaining of a draught, we will at once yield precedence to him as a ventilating engineer, and confess to his having accomplished what has hitherto been to us,—we candidly say it,—an impossibility. All those who participated in the experiments were cognisant of the fact that a draught was occasionally felt from the air-inlets, but they were possessed of a sufficient knowledge of the laws which govern ventilation, especially as regards the air supply, to know that such was, under the existing conditions, unavoidable. The Board of Works did not, at the time our system was applied, deem it advisable,—taking, no doubt, into consideration the very costly and elaborate methods of heating, by which means only the air could be warmed, and the obstruction to business which would be caused during its application,—to specially provide for the warming of the air supply; but we have since then brought out a simple and inexpensive arrangement to effect this, already described in your valuable columns, and which we have submitted to the Chief Commissioner of Works with a view to its application to the Long Room, and should it be adopted, we can confidently assert that there will not be a single flaw to be found in our system, and the only objection which Mr. Seddon can bring against it at present, and one,—from the restrictions under which the work was carried out,—over which we had no control, will then be removed.

Your correspondent goes on to say, "Six ventilators, of apparently 3 ft. diameter, have been placed in the ceiling, from each of which a shaft, 1 ft. 6 in. in diameter only,\* subdivided into four parts by crossed partitions, was carried above the roof, and there surrounded by cowl arrangements." . . . "To be true, the tests should have been applied at the bottom of these overhanging shafts. The exhausting power could only have been operating in two of the divisions of each shaft at one time, and, as a fact, it is sometimes operating only in one; and there would be actually down-draughts through the others in cold weather. . . . So much for the capacity and efficiency of the outlets provided."

Now to show what value is to be attached to Mr. Seddon's "Practical Study on Ventilation," which is the heading to his letter, and the knowledge which he has of our system, and its application:—

Firstly. The air-pump ventilators are not merely apparently, but are in reality, 3 ft. in diameter.

Secondly. They are not placed in the ceiling, but on the ridge of the roof.

Thirdly. The air-pump ventilator is not a beam of wood, but an arrangement to secure an equal extraction of air through a shaft independent of its diameter, the ventilator being a given size, the amount of air extracted depending upon the diameter of the ventilator, and not of the shaft.

Fourthly. There are no cowl arrangements surrounding the shafts carried to the roof, there being nothing but the air-pump ventilators surrounding them.

Fifthly. There are no partitions whatever in the shafts; therefore it is not a fact that at times there would only be an up-current in one quarter of the shaft and a down-draught in the other three. Such a thing could not occur in nature.

Sixthly. The tests were made at the ceiling end of the shafts.

With respect to the alleged down-draught, we beg to give the following extract from a contemporary:—"During the whole of the experiments there was not the slightest down-draught perceptible in the air-pump ventilators, even when all the inlets were closed." We challenge Mr. Seddon to contradict the above, either from his own experience or the experience of others, or to show that there has been any down-draught experienced since the experiments were made. Mr. Seddon casts a very gratuitous and unmerited reflection upon the gentlemen who witnessed the experiments, and whom he rather inconsistently designates "distinguished scientists" when he questions their and our knowledge of the action of the anemometer, giving as a reason for the doubt the very logical one, that "a mistake had been made at the Kew experiments in the reading of the anemometer."

Your correspondent further goes on to say, "the fluctuating average speed, as tested by Mr. Rogers Field, was stated to have been 535 ft. per minute, for six ventilators 3,150 ft. per minute, or 189,000 ft. per hour. Dr. Richardson made it considerably more than twice as much. Which was correct?" Before Mr. Seddon took upon himself to publicly criticise the experiments at the Custom House, in common prudence he should have made sure that he correctly understood the published results. If he had taken this simple but necessary precaution when he assumed the rôle of censor, he would have known that the figures given by Mr. Field did not apply to the ventilators at all, but to the velocity of the wind. He further asks a very simple question with respect to Dr. Richardson's figures, taking into account his professed knowledge of ventilation. Is your correspondent not aware that roof ventilators extract more or less air according to the strength of the wind impinging upon them? If this is news to Mr. Seddon we have pleasure in giving him the information he demands.

Mr. Seddon's supposition that wind blowing upon the ventilator would impede the exit of the vitiated air is a display of ignorance of the subject, on which he claims to be an authority, that is, to say the least of it, surprising, as it is the drift of the wind which causes all roof ventilators to act.

He makes another mistake in saying that the figures tabulated during the tests watched by Dr. Richardson were something over 3,150 cubic feet per minute; the actual figures were 8,085 cubic feet per minute, as published in all the reports.

We do not think we can furnish a more conclusive refutation of Mr. Seddon's insinuations than by giving a few extracts from the *Civilian*, the accredited organ of the Civil Service, the writer of the article being, we understand, one of the editors, and employed in the Long Room. He may, therefore, be safely accepted as the mouthpiece of the rest of the occupants. It may also be mentioned that the *Civilian* did not take any notice of the application of the system or the experiments until they had had five months' practical experience of it during the worst part of the year,—from November until March. The following are a few extracts from the article referred to:—

"The clerks in the Long Room of the Custom House are to be congratulated upon having been at last relieved from the intolerable system of ventilation which existed in that important department. It used to be said that in portions of the room the air had not been changed for years, and although this was, of course, an exaggeration, there is no doubt that the atmosphere near the roof was always, at the close of the day, singularly cloudy and impure. It is well known that the clerks have seriously suffered in health in consequence of the abnormal conditions under which they have been compelled to work, and that several premature breakdowns are attributable solely to the detestable atmosphere of the room. At length the intolerable condition of things resulted in the authorities calling in Messrs. Boyle & Son, ventilating engineers, of Glasgow, who have entirely altered the whole scheme of ventilation, and on the completion a series of experiments were instituted to test its efficiency. The advantages of Messrs. Boyle's system have been rendered obvious to the most superficial observer. The atmosphere of the room is now clear and pure, and the old Long Room headache is a thing of the past. The clerks declare that they do not feel the prostration which was formerly the usual result of a day spent in a foul atmosphere, but they leave their work as fresh as when they commenced in the morning. Messrs. Boyle have, in a very rigidly observed apparatus during five days and in the presence of many scientific and practical witnesses, have convinced the Custom

\* "The strength of a beam is its weakest part."



House authorities that the experiment has been a great success. To show, however, the contrast between the present system and that which it has so ably replaced, the old method of ventilation was put in operation and tested; the down-draughts were, however, so annoying that the ventilators had to be almost immediately closed. No test, however, was needed to convince the officials that the old system was worse than useless, but it was necessary to prove to the distinguished company who watched the experiment that the condition of the room with Messrs. Boyle's apparatus at work and without it differed radically.

But the most curious result of the new system of ventilation has been exhibited in foggy weather. Under the old system a fog often remained for days in the Long Room, when the external atmosphere had become quite clear. On the Monday morning, the last day of the experiment, when a dense fog prevailed without, the atmosphere of the room was found to be perfectly clear, and we are in a position to testify from personal experience to the great benefits derived by the application of Messrs. Boyle & Son's system of ventilation to the Long Room. Messrs. Boyle are to be congratulated upon having successfully grappled with a grave difficulty which had almost become a public scandal.

Upon making inquiry, we find that our system of ventilation at the Long Room is acting as efficiently and satisfactorily as when first applied, the purity of the atmosphere being all that could be desired.

ROBERT BOYLE & SON.

#### WOODEN BUILDINGS AND THE METROPOLITAN BUILDING ACT.

WILLIAM BURNELL was summoned by Mr. Knightley, the District Surveyor of Hammer-smith, with respect to some wooden buildings which he had erected on land near Shepherd's-bush railway station. Mr. Knightley said he was compelled to take the proceedings, as he was afraid of fire. The defendant was a dog doctor and dealer, and what he complained of principally was the "dogs' kitchen," which was wholly composed of wood. The defendant said he used the place for boiling food for the dogs. He had used a similar kind of building in other places for thirty-five years without complaints. Mr. Partridge drove to the place to inspect the buildings, and afterwards adjourned the summons for a month, to enable the defendant to ensure safety from fire.

#### THE KURRACHEE BREAKWATER.

SIR,—With reference to the allusions to the Manora Breakwater, at Kurrachee (in the article on the "Destruction of Madras Harbour"), in the *Builder* of January 21st, as the engineer who constructed the work in question, on the design of Mr. Parkes (with whom also I am jointly responsible for the setting machinery adopted), and having continued in charge of the work since its completion, with the exception of an interval of furlough, I request the favour of your insertion of the following remarks, especially in reference to the Kurrachee Breakwater.

As I am not concerned with the Madras Harbour works beyond the interest which I naturally take in a work of a professional friend, and which I am persuaded will eventually prove a success, obtained at moderate cost, and will confer great benefit on a large tract of the Indian peninsula, so deficient in harbours, I do not propose to follow your remarks on that work. I may, however, mention, in passing, that the Madras Harbour is very far from having been destroyed, though, undoubtedly, it has suffered from a force of sea which has proved greater than could have been anticipated from any local records available. I may add that at Madras, as at Kurrachee, the force of the local wind has proved no criterion of that of the sea.

I now turn to the Manora Breakwater at Kurrachee, regarding which, in the concluding remarks of my paper read before the Institution of Civil Engineers in the season of 1874-5, I "submitted that the results as to time of execution, stability, and cost have been such as to warrant the construction and means adopted."

Since the above words were written the breakwater has stood, without material damage, the force of seven south-west monsoons, with their constant three-months' hammering of a sea frequently 15 ft. from hollow to crest before breaking.

The cost of the repairs during those seven years, including superintendence, has averaged Rs. 5,531 per annum, i.e. (taking ten rupees to

the pound sterling), just one half per cent. on the 109,000L cost of the breakwater.

And this amount has been chiefly expended in gradually adding a layer of concrete on the top to make up for the subsidence by settlement of the outer half length, which was founded on a deep bank of rubble tipped on the sandy bottom.

This has settled considerably,—an average of 4 ft.,—but regularly and without lateral dislocation, which, as mentioned in the paper, only occurred here and there on the shore half-length, where large boulders were met with in the formation.

With the exception of this settlement, which appears now to have nearly reached its limits, the breakwater stands as good as ever.

Judging from experience, I should be disposed to admit that some modifications of details might have been made with advantage; but this is no more than might be said of any large engineering work, and as the Manora breakwater stands, I doubt if any work of the kind can show a better record.

I may here notice an (probably printer's) error in your article, as giving eighteen acres instead of square miles, as the area at high tide of the Kurrachee Harbour land-locked natural pool.

W. H. PATRICK, M. Inst. C.E.

Port Engineer, Kurrachee.

Kurrachee.

#### ROYAL VICTORIA COFFEE HALL.

SIR,—In the very kindly and appreciative notice of the Royal Victoria Coffee Hall which appeared in your issue for February 18th, there is one sentence which may lead to misconception. You say the price of admission is raised on ballad concert nights. This is true only of the better class of seats,—the boxes and reserved stalls,—but admission to the gallery and pit is always (even on occasion of royal visits) 3d. and 6d.

The promoters of the scheme desire, above all things, to make the Victoria a People's Hall. If they can provide entertainments good enough to attract the wealthy, so much the better. Not only is their money a support to a struggling undertaking, and their presence considered by working-people a guarantee that the entertainment is worth going to, but those who are working the Hall would rejoice to think they were furnishing another link between classes whose lives lie usually only too far apart. By all means let there be diamonds in the boxes and shirt-sleeves in the gallery, but the Committee have no desire or intention to let the inhabitants of the New Cut be pushed aside for the sake of their richer neighbours.

A contrary report is likely to do the Victoria harm with the public, and by inserting this explanation you will therefore greatly oblige

ONE OF THE COMMITTEE.

#### SKILLED WORKMEN.

SIR,—Under this head much may be said and written; but, if we are to get instruction, we certainly must seek for some better explanation of the existing state of things than that which has been offered us.

I am of those who believe in the English workman of to-day being equal to his predecessors; that his condition, surroundings, and opportunities, have altered, but that he is what these have made him.

Society, or the public at large, is compelled to progress or change with the altered character of its time; numbers are every year added unto those who are required to earn their daily bread. Of these a considerable few aspire to be first workmen or master workmen, or architects. They enter, as a rule, by what is called the royal road, an office where they learn to draw pictures, abstract, and "bill," much in the same way as a parrot is taught to speak; they are set a copy and, having repeated it, are sent into the world to maintain themselves and instruct the public. Can we wonder that the public are not better educated if such fledglings are their only or chief instructors? And what man of experience will not bear me out when I say, of all the bitter reflections thrust upon him, not one can equal that of not knowing where to find an appreciative or sufficiently educated audience to allow of his work being appraised at its real value?

Not so did the ancient artists, architects, or chief workmen live. The early church was

the life of art, and under her protection the master worked with his pupils. Now, very few indeed are the masters who instruct in person their young men, and very few are the patrons who can appreciate good artistic workmanship,—workmanship which, in its details and in the putting together, goes to make the whole.

Supply will generally be found equal to demand, in labour as in everything else; they have a tendency towards each other. When architects require good work done, men can be found to do it, and who are always willing to be instructed. That man who says men are not disposed to learn does not yet know much about human nature, or he would know that in skill d labour to excel is the ambition of every honest man, and I have yet to learn that mechanics are worse in this respect than their fellows of any and every other social grade or position.

Employers of labour do well to know their men, but they do far better, if unable to direct them themselves, to appoint over them a man who is really what he professes to be—a competent foreman; but his chief qualification is generally found to be that he is what the men style a nigger-driver or bully. I have always found that firmness, punctuality, and a genuine respect and discrimination will produce as its results good work and quantity. For men who have families to maintain have a very good incentive; they do not care to have their household gods disturbed at all, certainly not oftener than necessary, and thus they combine for protection, for they have learned that "union is strength" by experience. The modern commercial builder, who to be successful must be a capitalist and good arithmetician, calculates his estimates and profits to be obtained therefrom only by knowing the exact cost of the required labour in their execution: thus he endeavours to obtain the greatest possible return from his workmen by getting as much as he can, and by every possible means, from them, and to reduce their labour he very properly employs the best machinery for doing that which formerly went far to make, and now in a great measure prevents the man becoming, a skilled workman early in life; for unless he has acquired by practice a complete mastery over his tools he can never become a skilled mechanic. With the best machinery which can be devised, and an efficient staff for its application, work of a superior character is now being turned out in far larger quantity, and at a much reduced rate, than formerly. This I am prepared to prove if necessary.

Another conclusion I will also challenge contradiction in, and that is, there are more good workmen to be found to-day than existed twenty-five years ago. "Oh," but some one says, "are there not a very great many now who do not know how to do anything well?" Yes; as before stated, supply is equal to the demand in labour, if not always found so in material. Monopolists, in their haste to be rich, make all men suffer in turn. Land is too heavily priced and transferred; the house which should cost 1,000L, if properly built, must be undertaken at 500L. Who will undertake it? In the first place, some lawyer is always to be found who will find a market for somebody else's money; he therefore in turn finds a jerry builder, who in turn again finds the ignorant, unskilled, and uneducated, and therefore least responsible workman to put up these (what shall we call them?) fever-breeding heaps of rubbish, which only require the atmosphere to disseminate their poisonous contents, and to exhibit their ruinous construction; but one of the parties to their production has been overlooked. Let us do justice as far as practicable. Plans and elevations must be prepared and submitted before the law has been complied with in the erection of such dwellings. Who has produced the pretty picture? The modern architect before described. There are many professing architects who are unable to compete with a great many of the workmen of to-day in the preparation of detail plans, thanks to the many efficient schools for drawing which now exist. Somebody says, "Drawing is not everything required to make a good workman." Who thinks it is? Not the workmen certainly; but I guess the readers of this paper know some professed architects who hold this opinion of their own capabilities. But are there not any good architects left? Oh, yes, there are many who know how to build without giving offence to the eye of a properly-educated critic, and know also whether the material used is



what has been specified; but these are not always the most successful. The British public prefer something new, or professedly so. They are aesthetic to-day. Are they? Are the many oddities jumbled together in a haphazard sort of way such as we now often see, art or the result of it? I do not think so.

In conclusion, let me say a word on unionism. It is not responsible for bad workmen, but it is, in its own best interest, compelled to exercise the rule quoted by "Joiner"; for if men are unequal "and they are in skill as in all else," the most efficient is the most skilled, and therefore keeps his employment longest, and that man who cannot maintain or obtain employment through incompetence is a drag upon the funds of his society, and therefore not one to be admitted.

Skilled workmen are deserving to be held in the greatest esteem, for men who can use with precision many tools in the art of building or in manufactures, and can practically apply their knowledge of Euclid in their everyday occupations, will eventually receive more credit, for they are superior to some of those men who now sit behind a desk, knowing how to use but one,—a pen,—and that in the copying of instructions or quantities, supplied by another.

JOHN GEO. CAREY.

#### BUILDING BY-LAWS: MORTAR.

A CASE of considerable interest was last week decided by the Hove (Brighton) magistrates. A speculating builder, named Edmund Turner, was summoned by Mr. Ellice-Clark, the Surveyor to the Local Authority, for not "properly building and solidly putting together with mortar" the external and party walls of three houses in Sackville-road, Hove. From the evidence of Mr. Ellice-Clark it appeared that he surveyed the walls in question on December 22nd, and served the defendant with a notice to take down the walls on the following day. To this notice no attention was paid; and on the 11th of January specimens of the mortar were removed from the walls for analysis. Mr. Ellice-Clark said the material used between the bricks was not mortar in the sense that mortar is a material composed of lime and sand, or cement and sand, in such proportions as would attain an inherent hardness, and adhere to bricks or stone, having such cohesive properties as would hold them together so as to resist pressure or shocks. Good mortar would attain such a degree of induration as that frost, rain, and sunshine would not reduce the permanent hardness. The material used by the defendant was composed of coarse gravel, loam, and a little lime, and was not a mortar which would solidly put together a wall.

Two other surveyors gave confirmatory evidence. For the defence, it was urged that the mortar, though not of a high class, was still such mortar as complied with the By-laws, and evidence was given by six or seven builders to show that the mortar was good, several giving their opinion that it contained one of lime to four or five of sand and gravel, which they considered was good mortar. Amongst the witnesses for the defence were two members of the prosecuting Local Authority, both of whom were also members of the committee who initiated the proceedings. Mr. Simpson, an architect of many years' practice in Brighton, was also called, and gave his opinion that the mortar was good, and sufficient for the class of property, although, subsequently to the notice of the Town Surveyor, one of the walls had fallen down. This, the witness considered, was due to the rapidity with which the work was pressed forward, and not to the bad quality of the mortar.

The evidence thus being of a conflicting nature,—on the one hand, Mr. Ellice-Clark, the Town Surveyor, giving his opinion that there was but 1 part of lime to 7 or 18 of gravel, sand, and loam, and the defendant's witnesses putting the proportions at 1 to 4 or 5,—it was decided to have the mortar analysed by Mr. Jago, F.C.S.

The result of the analysis was as follows:—

	COARSE MORTAR.*						FINE MORTAR.*			
Gavel . . . . .	61.20	62.31	68.21	61.72	67.18	51.25	8.31	10.71	31.68	
Sand . . . . .	12.38	10.49	13.75	17.02	13.84	22.53	5.33	58.80	47.07	
Carbonate of lime (chalk) . . . . .	6.51	5.59	8.12	9.93	9.33	10.48	10.73	17.52	10.67	
Quicklime . . . . .	3.77	4.47	1.93	3.78	0.71	2.96	7.50	1.82	2.56	
Combined water and loss . . . . .	1.21	1.33	0.62	0.99	0.24	0.35	2.40	0.58	0.82	
Clay . . . . .	6.84	9.11	7.37	7.25	8.31	8.33	17.73	10.53	8.20	
The amount of gravel and sand to 1 of lime by measure . . . . .	8.81	7.7	16.9	10.2	43.41	10.4	3.06	12.2		

\* In 100 parts by weight.

The gravel and sand being taken at 110 lb. to the cubic foot.

The lime . . . . . 44 lb. . . . .

By these figures it was seen that the amount of lime, as compared with the gravel and sand, was in all but one case very disproportionate, and if the other aggregates had been added to the gravel and sand, the case of the town authorities was still stronger and their surveyor's evidence substantiated, while that of the defendant's witnesses fell to the ground. Under these circumstances, the Bench were unanimous in inflicting on the defendant a fine of 5*l.* for using material which was not mortar, and 1*s.* for procuring it to be used, and of the building was directed not to do so by the Town Surveyor. The Bench expressed their regret that it was out of their power to order the demolition of the buildings, the power of doing this resting with the local authorities.

Reflecting on the case, three prominent features of general interest are brought to light. The weakness of by-laws in not specifying the ingredients of mortar; the appearance of two members of the prosecuting committee in favour of a defendant whose case was so glaringly bad; and the demolition or retention of the condemned houses resting with the local authority, whose members gave evidence against their own officials. Up to the present time the authorities have not yet ordered the demolition of the houses.

#### SCHOOL-BOARD SCHOOLS.

Bradford.—At a meeting of the Bradford School Board on the 22nd of February, a letter was read from the Education Department, approving the plans for Wapping-road School, with accommodation for 334 older children and 338 infants, and sanctioning the borrowing of 3,600*l.* for the purpose of putting the plans into effect. Approval was also given to the plans for Backerend and Carlton-place schools, the accommodation in the latter place being for 407 boys, 414 girls, 352 higher girls, and 328 infants. The Department requested that tenders should be forwarded for consideration. It was resolved to affix the seal of the Board to the contracts for the purchase of the Carlton-street School site, and to accept the elevation plan for the school, subject to the approval of the Education Department. Mr. Milligan remarked that he had a letter from the architects of the school, which gave an estimate of the cost of buildings, playgrounds, &c., at 14,000*l.* The site had cost 5,000*l.*, and the total sum required for building and furnishing the school was estimated at about 20,000*l.* As nearly as possible accommodation for 1,600 children would be provided, and the outlay per child was, therefore, put down at 9*l.* 1*s.* 4*d.*

Finstall.—The new schools at Finstall, erected for the Stoke Prior United District School Board, have been opened. The schools, including benches, desks, and fittings, have, it is stated, been erected for somewhat less than 6*l.* per child. The new schools are situated at Aston Fields, near the railway station, Bromsgrove. About a year ago the School Board invited architects to send in plans in competition for the proposed building, and about eight sets of plans were submitted to the Board by various architects. The design bearing the motto, "Convenience and Economy," submitted by Mr. John Cotton, of Birmingham and Bromsgrove, was selected, and the tender of Messrs. Tils & Fisher, of Bromsgrove, amounting to 12,901*l.*, was accepted. The premises accommodate 220 children, and comprise a mixed schoolroom (boys and girls), 57 ft. long by 20 ft. wide, with a class-room 20 ft. square; infants' room, 32 ft. long by 20 ft. wide; book store, &c., and separate lobbies, lavatories, out-offices, and large gravelled playgrounds for each sex. The school-rooms are well lighted and airy, the roof being open to the collar-beams, and are warmed by strong Loxington bar grates, set with fire-brick backings and sides. The class-rooms and infants' school are supplied with the "Reliance"

patent desk, supplied, with other school appointments, by the Midland Educational Company, Birmingham. In addition to pivot-hung casement windows there are special inlets or ducts for fresh air by means of gratings under the window-ills, connected with slides in the window-boards, which are capable of being opened or closed at will. There are also means for the escape of heated or vitiated air through panels in the ceilings. The building, which is Gothic in style, is of red brick, with stone dressings where necessary, and has bold chimneys, and a steep-pitched roof covered with Staffordshire tiles and red ridge cresting. There is a bell-cot of open-timber work set on the roof. The site is enclosed from the road by a low brick wall, with hard stone coping, brick pillars with ornamental stone caps, double doors in the centre, and wrought-iron railing (made by Mr. Hedges, Bromsgrove, from special details) extending to the sides. The playgrounds are enclosed with substantially-built walls.

#### Miscellaneous.

Electric Light Engineering.—At the last meeting of the Society of Engineers, held in the Society's Hall, Victoria-street, Westminster, Mr. Jabez Church, President, in the chair, a paper was read entitled "Notes on Electric Light Engineering," by Mr. C. H. W. Biggs and Mr. W. Worby Beaumont. The few fatal accidents which have attended the employment of powerful electric currents for lighting purposes were first touched upon, and it was shown that these were entirely due to insufficient care in insulation, and need never recur. The calculation of resistances was next touched upon, especially with relation to the best arrangement of circuits and internal and external resistances of dynamo-machines, so as to secure the most economical results. The substitution of iron for conductors of large size in place of copper was next touched upon, in view of the possible rise in the cost of copper when many miles of conductors of large size are required for large installations, iron being shown to be cheaper, though the weight required would be about as 27 to 1. The different sources of motive-power were considered, steam engines being preferred as more economical, more uniform in velocity of rotation, more reliable, and as being capable of more precise regulation than gas engines as at present employed. Secondary batteries as accumulators and regulators were also referred to as having an important place in electric lighting and power-transmitting plant, and descriptions were given of some forms of these, as now before the public, which were published nearly twenty years ago. The cost of electric lighting on a large scale was given as about two-thirds that of gas.

Portraits of Villains.—We have received from the London Stereoscopic and Photographic Company a portrait of the wretch, Roderick McLean, who attempted to assassinate her Majesty on the 2nd inst. Doubtless some of our readers will be glad to know that they can add it to their collection of such portraits. We cannot blame the Company for hastening to supply a demand of the kind if it exist, but, for our own part, we deeply regret that such sound-reform should be foisted into additional notoriety, suggesting to other ill-conditioned and evil-minded persons anxious to become notorious how easily such an end may be attained. As to the present reptile, McLean, our regret is that he was not brained on the spot and pitched into the nearest cesspool.

Marlborough Rooms, Regent-street.—On Tuesday afternoon, the 28th inst., Miss Rosa Kenney, who made a very successful debut at Drury Lane some time ago, and has since been gaining experience in the country, will give a recital, which will include Alfred Tennyson's new poem, "The Charge of the Heavy Brigade at Balaklava," and a selection from "The Passing of Arthur." Miss Edith Wynne and some other distinguished artists will help her.

Smoke Abatement.—The Lord Mayor, the Right Hon. John Whitaker Ellis, entertained at the Mansion House, on the 11th inst., about seventy gentlemen connected with art, science, and literature, and more or less connected with the recent Exhibition of Smoke Abatement Appliances at South Kensington. Some good speeches were delivered by Mr. Shaw-Lefevre, M.P., the President of the Royal Academy, Mr. E. Hart, Mr. G. A. Sala, and others; the Lord Mayor himself playing his own part admirably.



**Tramways for Steep Gradients.**—At a recent meeting of the Metropolitan Board of Works a deputation waited upon the Board from the promoters of the Highbury-hill and Pentonville-hill Tramway schemes, to present a memorial in support of the proposal to construct tramways along Highbury-hill and Pentonville-hill. The memorial stated that provisional orders were being applied for by the Steep Grade Tramways and Works Company, for authority to lay tramways on the above-mentioned hills. The Vestry of Clerkenwell, who were the road authority for Pentonville-hill, and the Vestry of Islington, who were the road authority for so much of Highbury-hill as was under the jurisdiction of the Metropolitan Board of Works, had consented to the tramways being constructed. The promoters contemplated working the tramways by a process which they claimed to be peculiarly adapted to steep gradients, which had been successfully in use for nine years in San Francisco, and in other places abroad. The method of traction consisted of a wire rope placed in a tube beneath the level of the roadway, the top of which tube was provided with a narrow slit open to and level with the roadway, and running parallel with and midway between the tramway-rails. The purpose of this slit, which was less than an inch in width, was to allow of the projection through and movement along it of a hook or other fastening to connect the wire rope with the tram-car. The rope was worked by stationary engine-power, the engine works being also underground or placed in some building level with the houses, by the roadside and hidden from view, any point along the whole route being equally convenient as the position of the engine-power. The Board has since resolved not to oppose the granting of the provisional orders sought.

**Messrs. Crosby Lockwood & Co.** announce the immediate publication of the following works:—1. "Continuous Railway Brakes." By Michael Reynolds, author of "Locomotive Engine-Driving." This book will treat of the construction and working of the various systems of railway brakes now in use, and is intended for the general as well as the professional reader, and should prove of considerable interest, as the question of continuous brakes is now attracting the attention of the Government. 2. "The Action of Lightning, and the Means of Defending Life and Property from its Effects." By Arthur Farnell, Major in the Corps of Royal Engineers. 3. "The Boiler-maker's Ready Reckoner." By John Courtney. Edited by D. Kincaid Clark, M.Inst.C.E. 4. "A Practical Treatise on the Joints made and used by Builders in the Construction of various kinds of Engineering and Architectural Works, &c." By J. W. Christie.

**The London Fever Hospital, Liverpool-road.**—We are sorry to hear that two wards must be closed, owing to the want of funds. This is the only hospital in London devoted to the reception of persons suffering from infectious fevers, who are not paupers. It is very largely used by employees in shops, domestic servants, and schools; but there are also private rooms for persons of a superior class. The hospital has no endowment, and last year it exceeded its income by 4,000l. Its available capital is now reduced to less than 5,000l. If it does not receive largely-increased support, it must be closed next year. Will some of our readers help it?

**Memorial of the British Army under Wellington, 1813-14.**—Mr. E. J. Phisick, sculptor, has been commissioned to execute the various sculptured marble tablets to be placed in the beautiful memorial porch now being added, from the design of Mr. Milham architect, to the Church of St. Andrew, Biarritz. These memorials will contain the name of every officer in the British Army and German Legion who fell in the campaign between Oct. 7th, 1813, and April 14th, 1814, together with the place and date of death of each. They also will record the British loss of non-commissioned officers and men, under the heading of the various regiments engaged, with the date of each engagement.

**St. Pancras Workhouse Competition.**—We have received a long letter for publication from Mr. Bridgman, one of the competitors, and who has acted for the last eight years as architect to the Board, complaining of the course pursued by them, and especially that a professional man was not called in to assist them in adjudicating upon the plans, but we are unable to find space for it.

**The New Town Hall at Hermondsey** was formally opened on Wednesday last. The building, which occupies a site in Spa-road, adjoining the baths and was-houses, was described and illustrated by a double-page view and plans in vol. xxix. of the *Builder* (Nov. 13, 1880, pp. 588, 591). The architects are Messrs. Geo. Eltington & Son, and the builders were Messrs. Perry & Co., of Tredgar Works, Bow, whose tender, amounting to 21,200l., was accepted from amongst nineteen others. Dennett's concrete arching and Jackson's fibrous plaster have been largely used for floors and ceilings. Mr. Hammer has supplied the pitch-pine benches for the gallery. The hot-water apparatus is by Messrs. J. L. Bacon & Co. Messrs. Strode have supplied the gaseliers of the large hall and board-room, and the lifts are by Messrs. R. Waygood & Co. The furniture has been supplied by Messrs. John Finch & Co., and Messrs. Goode, Gainsford, & Co. The large hall, including the galleries, will hold about 1,400 persons.

**Presentation.**—An interesting presentation was made on Tuesday last at the Holloway College, Virginia Water, to Mr. J. W. Thompson, the contractor for the works, by his employees. It took the form of a bronze statue of himself, standing on a massive bronze pedestal, in which was a box containing an address. The modelling was by Signor Fucigna, and the work was carried out by Mr. J. W. Benson, of Lodgegate-hill.

**Impeachment.**—A Bedfordshire reader wonders to what extent architects are victimised by their plans being "cabaged" by borough surveyors and their relations, who make use of a good opportunity to do "a little on their own account." We attach no importance to general charges of this kind. If our correspondent were to point to special cases they could be inquired into.

**Kensington Artists.**—A *conversazione* is to be held in the Town Hall, Kensington, on Friday, the 24th inst., to the entertainment at which some seventy artists connected with the neighbourhood, many of them our leading painters, will contribute. Mr. S. Bird, of Sussex-place, is the hon. secretary.

**Builders' Clerks' Benevolent Institution.**—The fourth annual dinner of this useful institution is announced to take place on Monday, the 27th inst., at the Guildhall Tavern, Mr. Arthur C. Lucas, president, in the chair.

**The Third Annual Building Exhibition** in the Agricultural Hall, Islington, opens on Monday next, and will remain open a fortnight. We hear that in variety and extent it will surpass last year's display.

**Society of Lady Artists.**—The annual exhibition is now open at 43, Great Marlborough-street. We must find another opportunity to say a word or two about it.

## TENDERS

For alterations to premises, Worship-street, for Messrs. Cohen & Son. Messrs. Hammack & Lambert, architects:—

Brass .....	£5,243 0 0
Kilby .....	5,148 0 0
G. Williams & Son .....	5,100 0 0
Merritt & Ashby .....	5,055 0 0
G. S. Frisland .....	4,998 0 0
J. H. Johnson .....	4,993 0 0
E. Lawrence .....	4,981 0 0
Ashby Bros. ....	4,910 0 0
Bangs & Co. ....	4,899 0 0
Boyes .....	4,773 0 0

For the erection of a warehouse, Fann-street, for Mr. R. Stapleton. Messrs. Hammack & Lambert, architects:—

J. H. Johnson (accepted) .....	£1,005 0 0
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For the restoration of St. Michael's Church, Overmoigne, Dorset. Mr. S. Jackson, architect:—

J. Beer, Wareham (accepted) .....	£758 0 0
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For the erection of three cottages, for Adam Jones's Charity, Overmoigne, Dorset. Mr. S. Jackson, architect:—

J. T. Whelam, Weymouth (accepted) .....	£390 0 0
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For the erection of a villa residences, on the Bush Hill Park Estate, Enfield, for Mr. F. W. Harris. Mr. R. Adolphus Cope, architect:—

H. Baylis (accepted) .....	£370 0 0
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Accepted by the Hornsey Local Board for the following annual contracts, from March, 1882, to March, 1883, as per schedule:—

**Road Materials.**  
E. Head, City Wharf, New North-road, Hoxton, N.

**Street Watering.**  
T. G. Danmore, Crouch-end, N.

**General Carriage.**  
W. T. Williamson, Fetterly Works, Green-lanes, N.

**Dusting.**  
Hodson & Co., West Green-road, Tottenham, N.

**Street Watering.**  
F. A. Jackson, Woodstock-terrace, Finsbury Park, N.

**Mason and Pavior's Work.**  
P. Aspinall & Son, Crown Wharf, New North-road, N.

For erecting new banking premises, for Messrs. Brown, Janson, & Co., Abchurch-lane. Mr. John Whitehead, architect:—

Higgs, Hill, & Higgs .....	£9,140 0 0
Trollope & Sons .....	8,994 0 0
Mark Masley .....	8,797 0 0
Bywaters & Co. ....	8,675 0 0
Macey & Sons .....	8,668 0 0
Stevenson & Co. ....	8,459 0 0
Ashby & Horner .....	8,440 0 0
Rangs & Co. ....	8,400 0 0
E. Lawrence .....	8,364 0 0
Perry & Co. ....	8,160 0 0
David King & Sons .....	7,945 0 0

For additions to the Holborn Town-hall, Gray's-inn-road. Messrs. Isaac & Florence, architects. Quantities by Mr. L. C. Riddett:—

Comber .....	£1,441 0 0
Wall Bros. ....	1,394 0 0
Patman & Fotheringham .....	1,392 0 0
Woodward .....	1,309 0 0
Kilby .....	1,293 0 0
Macey & Sons .....	1,268 0 0
W. Scrivenor & Co. ....	1,219 0 0
Stimpson & Co. (accepted) .....	1,121 0 0

For pulling down and rebuilding the Dolphin Inn and fish-shop adjoining, in the High-street, Winchester. Mr. T. Stopher, architect:—

Shearman, Winchester .....	£2,350 0 0
Fielder & Son, Winchester .....	2,330 0 0
Sealey, Winchester .....	2,207 0 0
R. Carter & Son, Winchester .....	2,278 0 0
Crook, Southampton .....	2,193 0 0
Marsh, Winchester .....	2,193 0 0

For the execution of certain sewerage works at Stratford, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Nowell & Robson .....	£7,875 0 0
Williams, Son, & Wallington .....	7,500 0 0
Kellett & Bentley .....	7,207 0 0
Mowlen & Co. ....	6,568 0 0
Rendall, Market Basin .....	6,300 0 0
Turner & Son .....	5,998 0 0
Crockett .....	6,769 0 0
Bottrell .....	6,695 0 0
Co. & Co. ....	6,403 0 0
Bottoms Bros. ....	5,369 0 0
Dickinson .....	6,200 0 0
Rigby .....	4,840 0 0
Mackenzie, Williams & Co. ....	4,800 0 0
Holls (accepted) .....	5,493 0 0

For erection of baths at Skegness, Lincolnshire. Mr. James Whittin, Lincoln, architect:—

<b>General Contract.</b>	
Drarr, Hull .....	£2,734 0 0
Oranshaw, Skegness .....	2,515 0 0
Rendall, Market Basin .....	2,460 0 0
Riggall & Hewins, Grimsby .....	2,389 0 0
Kidd, Alford .....	2,198 0 0
Horton & Harrison, Lincoln .....	2,163 0 0
Dunkley, George, Skegness (acptd.) .....	2,160 0 0
Crosby & Sons, Lincoln .....	2,090 0 0

**Iron Roof to Swimming Baths.**

Sayers, Bradford .....	£459 0 0
Morson & Co., Liverpool .....	437 0 0
Mitford & Co., London .....	424 0 0
Rubery, Liverpool .....	425 0 0
Balmer, Old Bolingbroke .....	410 0 0
Young & Ayrrie, Hull .....	391 0 0
King & Co., Hull .....	389 0 0
Stephenson & Sons, Boston .....	369 0 0
Bretell, Worcester .....	342 0 0
Hill & Smith, Brierley Hill .....	340 0 0
Porter & Co., Lincoln .....	408 0 0

Note.—None were accepted, it being deemed to have a timber and slated roof, to cost about £363.

For the building of residence for J. M. Norman, at Laybar, Suffolk. Mr. F. E. Morris, architect:—

J. Welham, Layham .....	£2,438 13 0
E. Saunders, Dedham .....	1,834 0 0
G. Lee, Colchester .....	1,740 0 0
C. H. Oldridge, Colchester .....	1,734 0 0

For the erection of pair of semi-detached villas for Mr. R. Clitham, Colchester. Mr. J. F. Goody, architect:—

G. D. Ison, Colchester .....	£1,085 0 0
E. Rade, Colchester .....	1,020 0 0
A. Dias, Colchester .....	999 10 0
Everett & Son, Colchester .....	989 0 0
C. H. Oldridge, Colchester .....	947 0 0
F. Dupont, Colchester .....	925 0 0
A. Chambers, Colchester .....	899 19 8

For the erection of a new brewery at Northampton, for Messrs. Ratchif & Jeffery. Messrs. Davison, Inskip, & Mackenzie, engineers and architects. Quantities (for No. 1 contract) by Messrs. Curtis & Son:—

**Contract No. 1.—Building.**

H. Martin, Northampton .....	£5,940 0 0
Smith Bros., Northampton .....	5,585 0 0
T. Cosford, Northampton .....	5,580 0 0
C. Heap, Northampton .....	5,550 0 0
Dunley, Bluewater .....	5,087 0 0
J. Watkins, Northampton .....	5,086 0 0
Branson & Son (acptd ed) .....	4,975 0 0

**Contract No. 2.—Copper.**

<b>No. 1.</b>	<b>No. 2.</b>
Siddley .....	£250 0 0
Bindell Bros. ....	835 0 0
Bindley & Briggs .....	800 0 0
Henry Pontifex & Sons .....	665 0 0
Shears & Sons (acptd.) .....	604 0 0

**Contract No. 3.—Buckmakers' Work.**

Bennett .....	£150 0 0
Church .....	410 14 0
Oxley (accepted) .....	384 0 0

**Contract No. 4.—Millwrights' Work.**

Bennett .....	£1,057 0 0
Thornwell & Walsham .....	980 0 0
Oxley (accepted) .....	928 0 0

**Contract No. 5.—Pipe Connections.**

Bindell Bros. ....	£1,113 0 0
P. Fenner & Sons .....	894 0 0
Bennett .....	845 0 0
Oxley .....	918 0 0
Bindley & Briggs (accepted) .....	800 0 0



For proposed Mission-room, St. John's, Blackheath, S.E. Messrs. Drury & Lovejoy, architects. Quantities supplied by Messrs. Stradwick & Menzies:—

Hersey	£18'5 10 0
Pound	1'75 0 0
Corium	1'05 0 0
Tongue	1'40 0 0
Kirk & Randall	1'62 0 0
Bush	1'33 0 0
Jerrard	1'42 0 0
Smith & Son	1'49 0 0

For the erection of an hotel and stables at West Wickham, Kent. Mr. A. R. Steening, architect. Quantities by Messrs. Fowler & Eganman:—

Nightingale	£3 943 0 0
Macey & Son	3'310 0 0
Borrows	3'390 0 0
Cox	3'277 0 0
Jerrard	3'273 0 0
Graham	3'233 0 0
Onthwaite & Son	3'120 0 0
Sabey & Son	2'943 0 0
W. Downs	2'784 0 0

For repairs to the Embankment-wall, Grosvenor-road, for the New Westminster Brewery Company. Mr. H. W. Budd, surveyor:—

King & Son	£250 0 0
Mowlem	190 0 0
Shaw	198 0 0
Hoare & Son	182 0 0

For the erection of business premises, 72, St. Mary's-street, Cardiff, for Mr. S. Hara. Mr. W. D. Blesley, architect:—

Job Thomas	2'548 0 0
E. Howard	2'460 0 0
W. Thain	2'448 0 0
Charles Bird	2'310 0 0
David Thomas	2'290 0 0
Farnell & Fry	2'128 0 0
D. J. Davies	2'101 0 0
Samuel Shepton	2'085 0 0
Edwin J. Hines	1'976 0 0
F. S. Lock	1'974 0 0

For alterations to 59, Crockherb T-wn, Cardiff, for Dr. Williams. Mr. W. D. Blesley, architect:—

Samuel Shepton	£222 5 0
R. Howard	22 0 0
E. Freeman	220 0 0
Farnell & Fry	215 0 0
Charles Bird	190 0 0
Wm. Thain	179 0 0
D. Thomas	150 0 0

For pulling down and rebuilding house and shop, 343, Commercial-road, for Rev. C. Bromhead. Messrs. J. & J. Beiler, architects:—

Hill	£231 0 0
Friggins	713 0 0
Moyll & Son	648 0 0
Veal	698 0 0

For rebuilding workshops in Ship-street gardens, Brighton, for Mr. James Holmer. Quantities supplied by the architect, Mr. Henry Branch:—

Ida & Son	£1,029 13 0
Howard	809 0 0
Wright (accepted)	919 0 0

For forming roads and constructing sewers, &c., on the Chitto Hill Estate, Wood Green, for the Artisan's Freehold Land Company. Mr. Cronk, surveyor:—

Keeble	£2,700 0 0
Killingback	2'637 0 0
Nicholls, Wood-green	1'795 0 0
Adams	1'760 0 0

For the Princess Alice Memorial Hospital, Eastbourne. Mr. Thomas W. Cutler, architect. Quantities by Messrs. Quilter & Hardcastle:—

Cornwell, Eastbourne	£6,857 0 0
Dire	6'511 0 0
Wheeler, London	6'400 0 0
Peckles, Eastbourne	5'633 0 0
Bentley, Waltham Abbey	5'427 0 0
Perry & Co., London	5'360 0 0
Nightingale, London	5'110 0 0
Jones & Co., Gloucester	4'799 0 0
Crook, Southampton	4'719 0 0
Kingierles, Banbury	4'560 0 0
Longley, Sussex	4'394 0 0
Gregor, London	4'357 0 0

For additions to the Clarence Esplanade Pier, Southsea, for the Clarence Esplanade Pier Company, Limited. Messrs. Davis & Emanuel, architects and engineers.

Quantities supplied by Mr. H. P. Foster:—

For Enlargement of Pier Platform.	
W. Hill & Co. (accepted)	£1,575 0 0
For Substructure of New Pavilion and Approach.	
W. Hill & Co. (accepted)	£770 0 0
For Superstructure of New Pavilion and Approach.	
W. Hill & Co. (accepted)	£5,583 0 0

For New Tramway Depot at Gosport, Hants, for the Provincial Tramways Company, Limited. Messrs. Davis & Emanuel, architects. Quantities supplied by Mr. H. P. Foster:—

G. Burbridge	£2,317 0 0
T. C. Cooper	3,300 0 0
W. Ward	3,292 0 0
H. & W. Evans	3,109 0 0
W. R. & C. Light	3,000 0 0
W. Hill & Co. (accepted)	2,860 0 0

For additions to North End Tramway Depot, Portsmouth, for the Provincial Tramways Company, Limited. Messrs. Davis & Emanuel, architects. Quantities supplied by Mr. H. P. Foster:—

T. C. Cooper	£290 0 0
W. Ward	707 0 0
H. & W. Evans	766 0 0
W. R. & C. Light	727 0 0
George Beech	657 0 0
George Burbridge (accepted)	693 0 0

For the erection of dwelling-houses, Stoke Newington, common, for the Incorporated Society of Licensed Victuallers. Mr. H. L. Newton, architect. Quantities supplied:—

Chamberlain Bros	£12,364 0 0
Walker	12,310 0 0
Steel Bros	12,310 0 0
Grimwood & Sons	12,301 0 0
Word	12,230 0 0
Royal	12,254 0 0
Smith	11,898 0 0
Gentry	11,800 0 0
Lamble	11,735 0 0
Richerhill Bros	11,554 0 0

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NOTICE.—The POLYGONAL REFLECTOR (Latest Patent) FOR ARTISTIC and PICTURE GALLERIES. Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.



# The Builder.

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## THE BUILDING EXHIBITION AT THE AGRICULTURAL HALL.

It is, of course, inevitable that the Building Exhibition of one year should present many repetitions of what has been seen in the previous exhibitions. The object of each exhibition is to represent the available materials and methods of building-construction as they are at the moment, and whatever is in use seems to be regarded as having a claim to be represented in the year's exhibition, so as to render it a complete epitome of the subject. Hence there are a good many things which can suggest no remark further than what has been said before about them. With whatever desire to improve, men cannot always be on the stretch of invention, and a thing which is thoroughly good might, in fact, be spoiled by attempts to refine further upon it unnecessarily for the mere sake of change. This year there is even more reason to be impressed with the sense of repetition in some directions, because we have not long since had two exhibitions of sanitary appliances and of grates, a good many of which, the latter especially, meet us again in the Agricultural Hall in the same guise and with the same advertisements and assurances of their peculiar value: and these we can only bow to as old acquaintances and pass on. Of a good many of the exhibits which represent special building materials of proved excellence, also, all that can well be said is that they seem to keep up their quality, and to continue to deserve the reputation they have obtained. There are novelties here and there, however, and there are a good many things which, without being novelties, suggest considerations when we regard them not only from the builder's, but from the architect's, point of view also.

Among the materials in use for the heavier portions of building construction, the one which we are at present looking to with most interest is Concrete. It is possible, in spite of certain drawbacks to concrete buildings as hitherto carried out, that the employment of this material is yet to fill a much larger space in the building of the future than has been at present realised. Comparative cheapness,—which, however, has been exaggerated, and depends, of course, largely on local circumstances; less necessity for skilled labour; durability; fire-

resisting, or, we may even say fireproof, qualities,—these are its main recommendations; to which may be added greater impermeability to damp than any equal thickness of stone or brick walling. Its disadvantages are prominent rather from the designer's than from the builder's point of view; disagreeable tone and surface, and intractability in regard to decorative treatment, are the principal drawbacks which the artistic architect feels in dealing with concrete. But in regard to tone, the difficulty has been shown to be capable of being entirely overcome by the simple expedient of mixing colouring matter with the cement. Mr. Lascelles has done this most effectively in his rich red-brick-tinted concrete, and also in some green-tinted concrete, which he exhibited in the shape of a chimneypiece in last year's building exhibition; and so easily may this principle of applying colouring matter to the cement be varied in the formation of different tints, that it is surprising that any concrete builder should give his work the disadvantage of showing nothing but the natural rather dirty-white tone of cement concrete in its normal state. The intractability of the material is not so easily got over. By the use of concrete of very fine grain, Mr. Lascelles and the Eureka Concrete Company can, it is true, exhibit chimneypieces and other such objects, showing a sharpness approaching that of cut stone or brick; but it is only an approach, after all, and it has all the disadvantages which are, in a designer's view, inseparable from cast work of every kind; and the experiments which have been made in this direction, clever as some of them are, seem to show that, in regard to design, concrete must remain a background on which to place other ornament, rather than a substance capable of high-class ornamental treatment in itself. In regard to the practical treatment of concrete, an important step seems to have been made by Mr. H. Fajja, whose name is well known as an engineering expert in regard to the use of this material. He brings forward a method of artificially accelerating the hardening of concrete by exposing it to a moist heat of about 100°, and subsequently to a silicious application. Mr. Fajja states that by this treatment concrete which was three days old had been found to attain a strength equal to that of many neat cements when a month old, thus shortening greatly the time necessary for warehousing the concrete until it has firmly set, and giving the manufacturer the double advantage of less delay and of saving of space and expense in premises, as not nearly so many things need be warehoused at the same time. At present, as he observes in his circular, the great advantage of cheapness appertaining to concrete goods is largely, and, in many cases, fatally counteracted by the length of time which is necessary to complete an order for any special work.

The dated specimens exhibited, some two or three days old, seemed as hard as any concrete could be; it would have been as well, however, to have had duplicate specimens cast at the same time as the others, and not subjected to the insulating process; a more complete and practical comparison could then have been formed as to the extent of the insulating quality of the new process.

There are several good concrete exhibits to be noticed. In those of Mr. Drake the speciality consists in the use of a concrete made of marble fragments, which produces a very agreeable tone and texture, and is susceptible of a considerable amount of polish. The white marble concrete of this class, which is shown in the form of a set of steps, has a most agreeable surface and texture, the two whites of the marble and the cement combining to form a general pearly grey tone. The same exhibitor shows concretes of coloured marble rubble with coloured cement, producing various tones, which, however, have rather too much the appearance of imitation marble. With the white marble concrete this is not the case; it resembles no other material, and has a character of its own. Mr. Lascelles's stand includes some new applications of the red concrete which he has brought into use, which are not all of equal merit to the architectural mind. Among others is "a new kind of wall, built of Potter's slabs, stained to match old stone-work, as used in the wall just completed near the Swiss Cottage Station, which harmonises quite with the old building." Considering that the same eminent and very enterprising builder has already made red concrete walls in imitation of old English tiled walls, we can scarcely expect that after such an aesthetic sin he would not go further in the same direction; but it is to be wished inventors could be made to understand that architects (those who are in their senses at least) do not want imitation materials of this kind. They will be very grateful to Mr. Lascelles and other practical men who will invent for them materials which combine economy of production with sanitary qualities and pleasing appearance; but the last thing architects want is to have such made in mimicry of other materials perfectly different. This is the crying sin of makers of concrete, however, and we have never seen it carried to more absurd lengths than in this exhibition. We cross to the stand of the "Eureka Concrete Company," and there we find fireproof concrete doors of admirable workmanship, and made in thickness no greater than ordinary joiners' doors, showing conclusively the tenacity of the cement employed and the excellence of the manufacture; but these doors are made in precise imitation of a joiner's door, with stiles, panels, and mouldings round them,—a form which, of course, is simply the expression of joiner's con-



attention, and has no sense or meaning of any kind when copied in concrete. If the makers had got any one with a notion of design to make them a suitable design for a concrete door, they might have presented us with something new and pleasing in appearance, as well as satisfactory in construction. They show a model of a stable floor laid with concrete, put down in large slabs; but here again they cannot be satisfied without cutting a considerable portion of the floor into the resemblance of jointed brickwork. A certain breaking up of the surface is necessary to give foot-hold, but it might have been done in a way that would have given an agreeable design to the eye, and not have falsified the construction in so absurd a manner. The very merit which the company claim for their stable-floor is that it is laid down in large blocks, and they proceed diligently to make it look as if it were not. But the crowning absurdity in concrete design is reached in Mr. Tall's house, a two-storied cottage, forming Stand 49, and stated on a large placard to have been designed and put up by Mr. Tall in five days. A very good, and we have no doubt a very cheap piece of work, practically, but in its architectural treatment a conglomeration of shams; the lower portion of the exterior is in imitation of coursed ashlar, the upper portion in imitation of half-timbered work with cross-bracing, and the interior walls in imitation of wood panelling with moulded stiles. If builders are not yet aware that this kind of mimicry work is regarded, by every one who knows what architectural design is, as so much absurd vulgarity, only fit to be laughed at, we must go on telling them so until they do know it.

Among the ornamental employments of concrete the Eureka Company, before mentioned, exhibit a chimney-piece in red concrete, which is creditable for the sharpness of its modelling, comparatively speaking, of course; and Mr. Lascoll's has a new application in the shape of a red concrete bath, which looks very well in itself, and is practically suitable, though it may be observed that clean water never looks so attractive as in substances of light and bright tone, such as white marble, which bring out the clearness and sparkle of the water; and the preference for white for the interior of a bath is almost instinctive on this ground. When the water is not quite clean, it is best that this should be distinctly seen, which will not be the case with Mr. Lascoll's red bath. He calls it "a Roman bath," by the way, but the ornament round it and the general form are Greek rather than Roman.

The Belvedere Concrete Company, at a stand in another part of the room, exhibit various bits of statuary in red concrete, but these, of course, are casts, and very deficient in sharpness, and we can see nothing to be gained by exhibiting the application of material to purposes for which it is never can be really suitable.

A considerable number of specimens of building stones and granites, rough and dressed, are got together at Stand 70A, by Mr. Trickett, who also illustrates the subject by a small building illustrating various ways of finishing masonry; but there is nothing to call for special comment in regard to this exhibit. We would suggest, however, that a very useful contribution to such an exhibition as this might be made by the arrangement of specimens of building stone, accompanied by brief data, arranged in some systematic and concise form, on cards or otherwise, concerning the weight, chemical composition, strength, &c., of each specimen. Such data are to be got partly from published books, and partly from the experiments of individuals, no doubt, but not from any books that are very popular or accessible; and the tabulating of the materials and their respective qualities, and the work they are fittest for, in a public exhibition, might draw the attention of many who have too much neglected this kind of study of materials. The "siliceous stone" exhibited by Messrs. Hodges, Butler, & Dale, is a good material for steps and other things subject to much wear; the surface is not very agreeable in appearance. It is stated to be 25 per cent. cheaper than York stone, and far more durable, and looks as if it were so. But the newer forms of concrete seem likely to supply all that artificial stones can supply, with better and more agreeable tones of colour.

Of the staple building material, as we may still call it, brick, there is a considerable show, but nothing that strikes us as an advance on what has previously been done. We should rather like, in fact, to see more specimens of

thoroughly good, sound, plain building brick, with a certain amount of character about it. The unpicturesque character of English ordinary brickwork is to some extent due to the thickness of our bricks; a thinner brick produces a more agreeable-looking wall, though, of course, at the cost of more labour in setting. Bricks in the exhibition seem to run chiefly into more or less ornamental specialities, none of them, as far as we observed, new. There are the glazed bricks of Messrs. Cliff, of Wortley, admirable in surface, but somewhat "lond" in colour; the bricks of Messrs. Ingham, who make in the same neighbourhood, have the same character. Mr. Wood's pressed bricks (Stand 98), in red and buff tones, are agreeable in colour, and very clean and sharp; the ornaments shown are poor in style, as nearly everything of this kind in the exhibition is, artistically speaking. Occasionally are to be seen specimens of brick in which colour alone seems to be the object,—fashionable reds are to be produced, and so long as the colour is the right thing the brick may be as sandy and loose in texture as you please: against these we protest. We want to see more of the class of hard metallic-ringing brick, with a surface like iron,—a sort of building material which it is difficult to get hold of now, so much is brickwork running after fancy effects of colour instead of quality. At the stand of one exhibitor we observed a wall in process of building, with very pronounced red bricks and white pointing, carefully raised to or above the level of the brickwork; another foolish fashion, in which the production of a prim neatness of effect (not destined to last long) is substituted for the workmanlike and scientific use of mortar. Under the head of bricks we may mention one speciality, exhibited by Mr. White, of Abergavenny, who proposes to do wonders with the "Hygeian Rock Building Composition" (the patentee evidently thinks there is something in a name). With this composition, the constituents of which, of course, are a secret, he proposes an improved method of building walls so as to render them damp-proof, and to increase their strength. This is by building a 9-in. wall, for example, as two 4½-in. walls, with a space of about an inch between them, which is filled up with the composition in question, which penetrates into the joints and hardens and forms the tie between the two thicknesses of brickwork, besides interposing a stratum of material impervious to wet between the inner and outer thickness of brickwork. The illustrations given of the damp-proof qualities and of the tenacity of the composition appeared satisfactory, but we should prefer to have a thorough bond in the brickwork, in a wall of any height.

Of stoneware and terra-cotta there are the usual exhibits,—nothing out of the way. Messrs. Doulton occupy the centre of the hall, with a compact stand, containing a great variety of objects, in which the sanitary element is more predominant than is usual in their work, regard being had, we presume, to the practical character of the exhibition. A detailed examination of these and other pieces of sanitary mechanism in the exhibition would be better attempted as a separate subject, as no examination of such productions can be of any value without going minutely into their details. It may be added that the exhibition was in a very half-finished state on the first day, and the working of many of these things could not be illustrated. Messrs. Doulton include, however, objects of art in their collection, the central one being a drinking-fountain, to be erected outside St. Jude's Church, Whitechapel, the gift to the neighbourhood of Mrs. Barnett, the vicar's wife, and carried out by Messrs. Doulton from the designs of Mr. H. H. Statham. It is worth observing that the Street Drinking Fountains Association, who undertake to keep in repair and to supply with water fountains erected in accordance with their requirements, had refused to sanction anything but granite, asserting that every other material became worn out, and had to be replaced before long. Fortunately they accepted the assurances of competent authorities that the far more tractable Doulton ware was probably even less destructible than granite; and if they will act on this information in other cases we have a chance of seeing fountains of more variety and attractiveness of form and colour put up by the Association, at no increased expense, in place of the singularly bald and uninteresting granite design which they at present seem to adopt as their badge.

Among the other principal exhibitors of terra-

cotta and cognate materials are Messrs. Stiff & Sons, whose sanitary pottery, as it may be called, is as good as work of the kind could be in execution. From an artistic point of view the productions exhibited by Messrs. Willcock & Co., of Barmantote, are among the most admirable work of the class that could be seen. Their glazed bricks of various designs are mostly in excellent taste, and really splendid in richness of colour and texture; nothing more effective in its way could be put into the architect's hands as a means of constructive poly-chromy. Some other exhibitors would do well, even in their own interests, to take account of the value of getting work of this class designed by those who know how to design detail. Messrs. Stanley, of Nuneaton, for example, exhibit exceedingly good practical work in the way of tiles and air-bricks, and other things included under the general term of "glazed goods"; but their attempts at ornamental work are feeble to a degree. A glazed terra-cotta box for window plants, in the shape of imitation of rustic woodwork, is a kind of thing that, under the present condition of public taste, ought hardly to be exhibited at all; though it is no worse in taste, perhaps, than some of the imitative concrete work to which we have already referred.

Among the practical work which is concerned with the fitting and finishing of buildings, an ingenious novelty presents itself in the "safety" window-sash exhibited by Mr. B. Adams (Stand No. 1), the safety spoken of being for the cleaner of the window. The sash in outward appearance is an ordinary double-hung sash, but the turn of a key inserted into a keyhole in the vertical bar of the sash enables it to be released from the groove and turned on its centre, so as to be cleaned from the inside. Both sashes can be turned on their centres, and slid up to the top of the window, to leave a clear space for getting in heavy furniture through the window-space when required, and the top sash, when turned, can be slid down to the bottom of the sash-frame for greater convenience in cleaning. The model exhibited appears to work very well, and this is an invention which ought to be very useful in the case of large hanging sashes, a portion of the necessary fittings of a building in which there is much room for improvement. The lifting sash window is the principle generally preferred in this country, and has decisive advantages which will probably always recommend it, but on a large scale it is awkward to handle, and anything that tends to improve and render more convenient its practical working should have due attention. Amid the immense number of fittings of every kind which are exhibited, in regard to many of which it seems impossible to say that one man's work is better than another's, the value of the exhibition will consist in the extent to which actually new and improved ways of surmounting difficulties are brought forward; and it should be the object of judges to look for and specially distinguish these. The mere exhibition of what has been done for some time past, though it may, as we have said, be necessary to complete the exhibition as illustrating the present state of work, is of little importance in comparison with the invention of new processes which are really improvements on what has hitherto been used, or which appear sufficiently like improvements to demand consideration as to the advisability of their general adoption; and it would render the exhibition of more real and direct utility if manufacturers, without necessarily abstaining from exhibiting specimens of their staple work, would place prominently any contrivances for which a new principle or a new application is claimed, so that these can be easily singled out from the mass of things which have no such claim. In some cases this is done very decisively; but if these cases represent the only novelties, there is not very much of new application in the department of fittings, at all events. Among things which, though not exactly new, have come very little into use, may be mentioned Russell's "Binato" door-knob, exhibited by Messrs. Archibald Smith & Stevens, which is an absolute security against the constant annoyance from door-furniture working loose and coming off, the outside and inside handles forming one solid piece. In other cases we find articles exhibited which represent the usual make of the thing as it has been carried on for a long time past, in which the fact of the exhibition serves chiefly to show that no improvement has been attempted where it might very well have been looked for. Messrs. Warner, the eminent bell-founders, for



instance, exhibit a bell and its hangings, in the south gallery. Most of us know how a bell is hung; but what we should have liked to know from Messrs. Warner, or any other bell-founder who should appear in such an exhibition, is, whether they could devise no improvement, for example, on the clumsy and unscientific method of stopping the bell when it has been swung over its centre, by a stay simply sored on to the bell-stock at one end and striking a sliding bar with the free end. Even if the principle be the best, the stay should be secured in a more workmanlike manner, and made in a form better calculated to resist the strain and leverage on the stay, which, with a large bell in full swing, must be very considerable. We should be curious to know how often, in the annals of bell-ringing, a stay shaped and fixed in this way has worked loose and given way in ringing; an accident which might have very serious consequences to the ringer, as a heavy bell with a large wheel might wind him up to the ceiling before he could let the rope go. If Messrs. Warner will exhibit a bell with an improved stay next year, that looks as if it was meant for its work, or a bell-catch on an improved principle, it will be more to the purpose than sending an article which serves to show with what clumsy mechanism eminent bell-founders are content. The quality of their bells, of course, we are not here impugning; but that is rather a musical than a building question.

Though the main objects of such an exhibition as this are and should be practical, we find a considerable proportion of exhibits the object of which is to show different methods of decoration and decorative effect. Some of the best of these are for no special remark, as they only exhibit afresh, and in no essentially different form, the qualities which their exhibitors have already displayed here and elsewhere. The Lincolnshire-Walton material is displayed in as good form as it was last year,—an admirable material, illustrated in very tasteful designs. The stand of Messrs. Jeffery & Co. exhibits wall-papers which are nearly all of good design, and admirably executed. To go into criticism of work on purely artistic grounds, in any detail, would, however, be out of place in speaking of an exhibition of this kind, further than that we wish to discredit that which pretends to art only in a false and vulgar spirit. The main point is to consider how far the materials offered for purely decorative purposes are suitable practically, and in some senses aesthetically, for those purposes, how far their adoption is to be encouraged or otherwise. For example, we notice a stand of excellent work in scagliola, by Messrs. Bellman & Ivey, and we are bound to consider whether this success in scagliola is a sin or a virtue, from an architectural point of view. Messrs. Bellman & Ivey, we observe, are beforehand with us, and soon our criticism in advance. "N.B.," they say indignantly in the catalogue, "Scagliola is not a surface imitation, but a thoroughly artistic material, taking a high natural polish similar to marble." The emphatic italics are their own. We might puzzle the makers by asking them to define what they mean by "an artistic material"; at any rate, they forget the important distinction, that marble can play a genuine part in construction and scagliola cannot, but, when used as columns, only pretends to do so; and that when used as a wall decoration with no assumption of construction, its value arises entirely from the fact that it imitates marble, which is a finer and more costly material, and therefore produces on a hasty inspection an idea of costliness and luxury without really involving proportionate cost. No one would have invented scagliola except with that object; it is used because people would like to have marble and cannot afford it; it is a sham even in that sense. It is so still more when it is used in the way the makers say is their "specialty," for "surrounding iron or brick cores, without showing joints," because it there pretends to play a constructive part in building which it cannot play. If people will have scagliola, they will get it very good from Messrs. Bellman & Ivey, but no remonstrances on the part of those who are commercially interested in scagliola will recommend it to any one who has a true sense of architectural fitness and propriety. It has had its day, but the time is past for it now. Papier-mâché is a material which is largely illustrated in the productions of "The Papier-Mâché Company." In many of its applications this is a material unobjectionable, in so far that it is not imitative of anything else,

and is a more stable and lasting medium for cast ornament than plaster; though, as a material capable of advantageous use only for mechanically produced ornament, it can only take a secondary place; and much of the ornament produced in it is of the type that may be called "gim-crack," an expression that would apply to many of the things exhibited by the company. But the "fatal facility" of modern stamping and casting machinery has tempted the makers into imitation work here too, and we have a wooden Gothic screen with what, at a first glance, look like carved bands of foliage, which are, in fact, stamped paper-mâché inserted, and coloured as nearly like the wood as may be. Fortunately (or unfortunately, as we choose to regard it), the different texture of the material refuses to be entirely disguised, and betrays itself, to the disgust of the discreet critic. Messrs. Jackson, the well-known papier-mâché modellers, exhibit some fibrous plaster ceilings, which have the practical merit of being capable of being put up in sections of several feet square, as they are shown at the exhibition, so that they can be worked at the shop and put up in their place with the design complete. The designs are good and tasteful.

Messrs. Cliff, whose bricks we mentioned before, have endeavoured to revive Della Robbia ware (Della Robbia, it is erroneously spelt in the catalogue), and they have got something like the look of the thing, but their specimens are too tame in style. The work of Della Robbia and his followers, where it is purely decorative and does not deal with figures, is considerably open to criticism as being too realistic, but is redeemed by its remarkable freedom and boldness of style: the imitations at the exhibition seem to have got the realism without the boldness; a study of the spirit of original examples might enable the designers to remedy this. The use of Lincolne as a surface for painted decoration is shown in Messrs. Miller, Little, & Co.'s stand; the rough texture of the material is remarkably good for this purpose, and gives a peculiar and rich character to the colouring. In regard to the question of tone of surface in coloured decoration, the Silicate Paint Company's exhibit is an agreeable contrast to the shiny tone of ordinary oil painting, and has this dead and flat quality to recommend it, as well as its sanitary recommendations over oil paint. Coloured decoration of another kind is shown in the wood stains of Mr. H. C. Stephens; these are announced as preparations for dyeing wood in imitation of oak, mahogany, &c. If the patentee had only let the imitation notion alone, and recommended them as rich and durable colours for producing decorative design on the surface of woodwork, they might have our cordial approbation; the tones are very rich, and very suitable for producing conventional design on wood surfaces. The "Pile Wood Company" exhibit another means of finishing wood-surfaces, by what is really an exceedingly thin veneer, so thin as to be as pliable as paper, and capable of application to the contours of mouldings as well as to flat surfaces. In their exhibited specimens they have made the mistake, however, of imitating parquetry; and the process, though ingenious, is open to whatever aesthetic objection may be made to ordinary veneer, with the additional drawback that it is more fragile and less lasting. Of parquetry itself there is a good exhibition by Mr. Henry Bassant, good both in execution and in the character of the designs, which adhere strictly to what is suitable to this method of decoration. The decorations exhibited by the Papyrotile Company, and the embossed leather papers, in Japanese style, of Messrs. Hindley & Sons, are very good specimens of decorative material; the former we noticed in a previous exhibition. The embossed leather might be used with effect in other styles besides imitation Japanese.

In the large number of chimney-pieces exhibited by various firms, we cannot but be struck with the contrast between the fine material and good work and the very small amount of what can be called good design. In the marble chimney-pieces there is really scarcely any. There is a good deal of what is meant for effective design, but it shows no evidence of being produced by artistic hands. The best exceptions in this respect are some of the moulded and carved wooden chimney-pieces exhibited by Messrs. Steel & Garland. These are not only of excellent workmanship, but in some cases exhibit very good design, the better for being simple and unpretentious. Marble chimney-pieces seem to be produced mostly in

a very commercial spirit, and it is difficult, if not impossible, to procure anything from the stock of even the best firms which would satisfy a cultivated taste.

It is impossible to pass by so much costly and what is evidently intended to be decorative work of this class without a glance at its artistic pretensions, though we return to the position that art, as usually understood, is not the object of such an Exhibition, and that, so far as it touches on materials which are chiefly valuable from the designer's point of view, the genuine object is to show what materials are available for artistic effect, for the benefit of those who know how to use and combine them. It may be said that this is best shown by exhibiting specimens of their artistic treatment. If this view be adopted, the exhibitors, in their own best interests, should endeavour to procure the co-operation of competent designers, instead of merely making a big show of a quantity of weak and often bad design, turned out in the ordinary practice of their firm. Apart from the mere exhibition of materials in their crude state (which in itself is useful to professional and practical men, but not so interesting, of course, to the general mass of visitors), the higher object of such an exhibition should be to show the best way of doing everything in regard to materials, workmanship, and principles of construction; and then some good designs may be superadded to show the whole in the best light, if the objects are such as to come under the domain of decorative work. But, then, in such a case it should be the best class of design; anything less than this makes the thing a shop-window exhibition. The artistic and the practical treatment of materials in many cases touch each other very closely, if we accept Mill's comprehensive definition, that "all art is the endeavour after the perfection of execution."

He adds that a workman has worked in the spirit of an artist when his work shows that he desired perfection in it for the sake of perfection, even when a less complete treatment would have answered the practical purpose as well. There is work in the exhibition which comes fairly under this definition; there is a good deal which does not. There is too much of quantity and too little of quality; too much of the effort to advertise by making a great show. The Exhibition would be worth more, and would take a higher stand, if there were less of this mere wholesale display of wares, if many of the firms which exhibit were to restrict their articles more in regard to number, and aim rather at showing a model specimen of the best type of work of each class which they can produce. Things could be better seen, examined, and estimated at their true value, in that case. As it is, in a considerable proportion of the exhibition we seem to see, not the effort to do a thing in the best manner possible, but the effort to exhibit in the most effective manner the way "our firm" do it, whether it be really the best way or not. In this respect there is room for improvement, and for a higher standpoint to be taken in future exhibitions.

It would be better on another occasion, as the exhibition is not open for long, to aim at having it really ready on the first day. As a matter of fact, the opening day was a scene of dust, dirt, and confusion, things being in process of setting-up and finishing whichever way one turned. On the other hand, we must commend, as we have done on former occasions, the systematic arrangement and numbering of the stands, and the equally systematic arrangement of the catalogue, which renders it easy to find whatever is wanted.

Having made these general observations, we proceed to mention *seriatim* the principal exhibits, at the cost of some little amount of repetition.

The third annual Building Exhibition was opened on Monday at noon, although, as is usually the case, a large number of the exhibitors had not all their goods in position until late in the evening; and several had to complete their stands on Tuesday. The exhibition is larger than that of last year, a portion of the goods displayed having to be located in the south gallery, a visit to which will repay the trouble of ascending the stairs. Taken as a whole, the exhibition fully maintains, and even surpasses, last year's standard of excellence. Bacon's aphorism that "houses are built to live in, not to look on," has been often quoted to the disparagement of those architects (if any such there be who are deserving of the name)



who would sacrifice the internal comfort and convenience of a house to mere external display. It is not too much to say that in the exhibition now open at Islington is to be seen every requisite appliance and material necessary to make, in the hands of an architect,—i.e., in the hands of a man who knows how to plan and how to design,—a house not only fit to "live in," but, to say the least, tolerable to "look on," this happy combination being quite possible of attainment while giving due regard to economy. When the public at large begin to know in what good building consists, the days of "jerry" building will be numbered, and architects will find (as they should do) increased employment in designing and superintending the erection of the houses of the people. As an educational agency in this direction, the present Building Exhibition is well worthy of being (as we trust it will be) largely visited by the general public, while those practically engaged in the various branches of the building trades cannot but derive some amount of instruction from a visit. At any rate, it will serve to "post up" the men belonging to particular branches in what is being done in other branches,—a matter of no small importance in view of that interdependence and co-operation so necessary to produce a good building. Without further preface, we now proceed to notice in detail some of the typical classes of exhibits.

#### 1.—BUILDING MATERIALS.

*Bricks, Tiles, Terra-Cotta, &c.*—The display in this section is much larger than last year, several fresh exhibitors having put in an appearance. Some were not quite in position on the occasion of our visit, and others whose names are in the catalogue were not to be seen as we passed through, though we have no doubt by this time they occupy their allotted stands. It is necessary to say this much, for, if scant notice appears of some deserving exhibitors, the neglect is not on our part, and where no mention occurs in our report of certain firms, recognition must be looked for in a supplementary or unavoidably postponed notice.

A handsome display by Doulton & Co., Lambeth Pottery, occupies the central stand in the hall, and the exhibits are multifarious. Apart from the glazed sanitary ware exhibited, this well-known firm shows bosses and architectural decorations in "Doulton Ware," glazed and unglazed bricks, encaustic tiles, Staffordshire blue paving-tiles, stoneware string-courses, window dressings, cornices, terra-cotta and wood mantelpieces, and a great variety of their ware adapted to sundry ornamental and useful purposes. The ware, as a whole, shows excellence in finish.

Messrs. Stiff & Son (Bay 20), London Pottery, Lambeth, have also this year a large and attractive display of terra-cotta, red and buff, including cornices, string-courses, balustrades, window-heads, pedestals, vases, air-bricks, sanitary stoneware of all kinds, all evidencing good manufacture. For excellence of firing and sharpness of modelling the architectural terra-cotta exhibited by this firm includes some of the best work which we have ever seen in this line.

Messrs. Cliff & Sons (Bay 23), Wortley, Leeds, and King's-cross, N., besides their glazed and sanitary ware, exhibit an excellent assortment of brick and tile ware, including various specimens of paving and fire clay goods. Their glazed bricks are well moulded and sound, and comprise plain and ornamental specimens of various colours. This stand is worthy of notice for some new specimens of ornamental terra-cotta and glazed stone ware, square and columnar, and, indeed, of various shapes for as varied uses. Mr. John Matthews (Bay 24), Royal Pottery, Weston-super-Mare, exhibits Poole's patent square-cornered bonding-roll roofing-tiles, with a collection of terra-cotta, statuary, vases, and rustic and floral designs, generally commendable.

Messrs. Smith & Co. (Bay 25), Canal Pottery, Old Kent-road, have on view a very good assortment of terra-cotta chimney-tops, terminals, and other ornamental finishings, including glazed stoneware garden-edging, invert blocks for bottoms of sewers, kitchen-sinks, drain-pipes, damp proof-course bricks, and kindred articles in connexion with sewers and drain construction.

The Paragon Brick and Tile Company, Rugby (Stand 83), have a fair display of machine-made bricks, ornamental and plain and of different colours. The "Paragon" bay windows are put

forth as a speciality, the bricks being made from specially-prepared clay, for which a hardness "more durable than stone" is claimed. Stanley Brothers, Midland Tile Works, Nuneaton (Stand 86), show blue clay goods, red and buff terra-cotta, fire clay and glazed goods, with patent-malt tiles and air-bricks. Messrs. Winger & Rolfe, Barchester-street, Poplar (Stand 87), show a speciality in the form of a stand with brickwork set in a cistern of water. This is intended to show the mode of application and utility of fibrous asphalt as an anti-damp course in walls. Though not exactly belonging to this section, it may be added they have on view a good display of roofing felt, inodorous bitumen felt, sacking, hair, and other useful felts. Mr. Thomas Lawrence, Bracknell, Berks (Stand 89), shows good specimens of tiling and brickwork, including a red brick column, illustrating plain workmanship, and a roof displaying his system of tiling. The specimens of gauged brickwork and carving in bricks are commendable. Messrs. Williams & Naah, Castle-street, Holborn (Stand 95), exhibit tile hearths, in addition to their marble chimney-pieces and fenders, noticed elsewhere. Messrs. Ellis, Partridge, & Co., builders' merchants, Lisle-street (Stand 96), exhibit a fair assortment of red, blue, and white facings, and other bricks, quarries, &c. On a small roof the roofing slates and tiles are shown in position. Mr. Charles Wood, Shirland-road, Paddington (Stand 93), has a good assortment of red and white pressed bricks, plain and moulded, Staffordshire blue goods, and terra-cotta ware.

Mr. J. E. Ellison, ventilating engineer, Leeds (Stand 99), besides exhibits belonging to another section, displays several specimens of his conically perforated bricks and air-grates in various colours and sizes, patent conical ventilators and "radiator" ventilators, in oak and iron. The Marland Brick and Clay Works, Torrington, North Devon (Stand 100), have on view white, buff, terra-cotta facing bricks and vitrified bricks. Their other exhibits include grooved pavings, architectural terra-cotta, and samples of the raw clay from which the above are produced. The Bracknell Pottery Brick and Tile Company, Bracknell, and Nine Elms, S.W. (Stand 5) exhibit a varied collection of red and white facing and moulded bricks, red and white rubbers, pressed Roman and other plain and ornamental roofing and ridge tiles. Both the plain and ornamental tiles evidence good handling, and the same may be said generally of all the exhibits, including the agricultural drain-pipes. Phillips's Patent Lock-Jaw Tile Company, Newport, Monmouthshire (Stand 88), exhibits a speciality in tiles, from which the company derives its odd name. The lock-jaw tile is said to be snow-proof, wind-proof, rain-proof, and above proof in other ways (with 150 to the square). There are glazed and plain specimens, and a roof is exhibited covered with these peculiar lock-jaw patterns. Carefully laid, they would appear to offer advantages, but time will testify as to their holdfast qualities. The tiles are, however, worthy of examination. Frictionless screw tile-making presses are also shown, fitted with fly-wheel and planed sliders, adapted to the manufacture of the brick and tile-ware shown. Messrs. J. White & Co., Worship-street, E.C. (Stand 70), have on view an assortment of plain and moulded bricks, paving-bricks, tiles, including roofing-tiles, ridges, finials, chimney-pots, pavements, dados, hearths, and sanitary pipes. The goods are worthy of commendation generally. Messrs. Wilcock & Co., Burmanston, Leeds (Stand 71), have on view a very fine assortment of glazed bricks, balustrades, and terra-cotta, with sanitary apparatus. The stand is attractive, and the goods evidence careful manufacture. The display exceeds in excellence that of last year.

The Hartshill Brick and Tile Company, Stoke-on-Trent (Stand 16), show floor-tiles of various sizes, and roofing-tiles of various colours, finials, terminals, and blue vitrified paving and building bricks. Messrs. F. Rosher & Co., Blackfriars (Stand 154), show a good and varied display of different kinds of bricks, plain and ornamental, roofing and ridge tiles, and specimens of window arches and doorways in sets, ready for application. Mr. William White, Abergavenny (Stand 157), exhibits brick walls constructed in two thicknesses, with a small space left between, into which a composition is poured in a liquid state. This "Hygeian Rook Building Composition" (White's Patent) binds the two thicknesses, greatly increasing their strength, and rendering the walls damp-proof. A

weight of 8 cwt. is suspended from the centre of a beam, of the brickwork, supported girder-fashion, to show the strength of the work cemented by this composition. It is claimed that a 9-in. wall treated with this cementing material will be stronger than a 14-in. wall built in the ordinary manner. There are also exhibited in this stand specimens of water-tanks put together with this composition. The novelty is worthy of examination, the tests being apparently of a satisfying kind,—at least, on a cursory inspection. Messrs. Marsh & R. J. Smith, Bridge-street, Blackfriars (Stand 5, South Gallery), show a fair assortment of bricks and tiles, being representatives of various manufacturing companies.

Messrs. Ashton & Green, St. Mary Axe, E.C. (Stand 69), in addition to their other numerous exhibits, noticed in another section, display a very good assortment of drain-pipes, terra cotta, chimney-pots, slates, cisterns, bricks, cement, together with permanent green slate, as used at the New Law Courts, and other excellent goods. Webb's Worcester Tiles Company, Limited (Stand 53) show a large and varied display of all sorts of geometric, mosaic, and encaustic tiles. Included are printed tiles for walls, ceilings, furniture, also printed under-glass hearth and other tiles. This is an attractive stand, with its adjunct, where are shown specimens of wood decoration in blocks or slabs. The Finsbury Park Brick Manufacturing Company (Stand 127) exhibit some commendable specimens of their red facing bricks, also pressed, malm, and stock bricks. A wire-cut machine is also shown by the Company. The Madeley Wood Company Brick and Tile Works, Ironbridge, Shropshire (Stand 143), have on view a very fair assortment of pressed roofing tiles, finials, gutters, and hips, together with buffacing bricks, squares, and other facings and finishings. The forms and patterns are generally well moulded, and show sound manufacture. The collections of brick and tile work, &c., which we have passed under notice are very varied, and, speaking generally, as a whole the exhibitors in this year's exposition have displayed good manufacture.

*Stones, Marble, Granite, and Artificial Stone.*—There are not many exhibitors of natural building stones detached or embodied in building construction, apart from marble and marble ornamental objects. Some of the exhibitors of last year are absent, but their places appear to have been supplied by an increase in the number of the exhibitors of artificial stones and concrete material. Among the exhibitors of specimens of natural building stones is Mr. S. Trickett, Victoria Wharf, Millwall, whose display this year exceeds that of last, both in detached specimens and in embodied workmanship. On this stand (103A) may be seen numerous varieties of building stones, limestones, sandstones, and granites, rough, dressed, or highly polished. There is a good assortment also of granite pitching, kerbs, macadam, &c. In embodied building construction an office is shown with shaped quoins, door-jamb, window moulded work, the central portion of the masonry work being rubble, executed in Yorkshire grit or freestone. This specimen is well executed, and is entitled to recognition. The Mansfield Pennant Stone Company, Staple Hill, Bristol (Stand 133), exhibit monumental headstones, pillars, steps, paving for street work, and samples of crossing stones for same. Messrs. A. McLean & Co., Belvedere-road, Lambeth (Stand 135), in addition to cements, exhibit chimney-pieces manufactured in stone cement, and various specimens of mouldings in coarse and superfine qualities. The specimens are cleverly turned out, and evidence good workmanship. S. & E. Ransome & Co., Essex-street, Strand (Stand 139), besides their indurating solution, now well known for curing damp walls, exhibit numerous specimens of artificial stone for various building, ornamental, and sanitary purposes. The list includes filtering-slabs, sinks, tanks, gratings, ventilators, free-grit grindstones, and artificial stone adapted to a variety of useful and ornamental wants. The display is large and attractive. Messrs. R. Thornton & Co., Stone Wharf, Nine Elms (Stand 157 b) show a large block of Portland stone from the firm's quarries, Portland Island, Dorset. The Patent Victoria Stone Company, Kingland-road, E. (Stand 159) have several good specimens of their artificial stone on view, including paving, platform coping, steps, and sinks. Messrs. Bellmann & Ivey, Wigmore-street, W. (Stand 74), show a very fine



and attractive display of scagliola marble for columns, pilasters, dados, architraves, wall-niches, and various forms of interior decoration. Among the examples are specimens of already executed designs in various public buildings throughout the kingdom. A speciality here illustrated is the surrounding of iron or brick cores with scagliola without showing joint.

**Iron.**—Messrs. Steven Bros. & Co., Upper Thames-street (Stand 45), among their various other exhibits, noticed in another section, have on view several specimens of ornamental iron work, of good design. These exhibits include spiral and straight staircases, balusters, newel bars, altar-rails, balconies, brackets, railings, ridgings, terminals, and vanes. Constructional ironwork is shown of various forms, and for very many uses, and the specimens on view are for as good as pieces of iron workmanship. Messrs. Tregon & Co., York Works, Brewery-road, N., and Jewin-street, E.C. (Stand 60), exhibit many specimens of galvanised iron roofing, dormers, cisterns, tanks, builders' buckets, and much plain and ornamental galvanised iron and zinc articles in connexion with house construction and building wants. Messrs. Ransome & Co., whose other exhibits are noticed elsewhere, have on view an assortment of building tackle and scaffolding appliances, worthy of attention. The scaffolding appliances of the Rottie Patent Seat and Scaffold Fastener Company, Bush-lane, Cannon-street (Stand 142), are worthy of notice, and will be looked at with interest. A piece or length of scaffolding is erected to afford an illustration. The scaffold-fastener is formed of two chains, one end having a tongue and the other a loop to slip over the same. The tongue-piece is provided with slots, and so arranged as to allow for varying girths of poles. To secure or bind the poles, the chain is passed round the same, and the loop end is slipped over the tongue until it is nearly tight. A flat wedge is then inserted at the back of the loop into one of the slots in the tongue, and driven down, tightening the chain. The whole process is very quickly effected, and is far more simple to the practical eye than any description can be. This fastening appliance ought to come into use under certain limits. The Rottie patent seat is also very simple in construction. By a combination of a couple of levers the rapid turning of the seat is accomplished, to a horizontal or vertical position at will. Where space is an object at times, in hotels, shops, and in other situations, the patent seat will be found serviceable.

#### II.—CONCRETE BUILDING.

**Monolithic Systems, Blocks, Slabs, and Apparatus.**—There are accession of strength and increased interest evidenced in this department of the present exhibition. Mr. W. H. Lascelles, Banhill-row (Stand 153), not only holds his own, but enlarges on his former doings in concrete construction. Here are plain and moulded concrete forms of all varieties in building and ornamentation. The list includes window-sills, transoms, door-jambes, gables, walls built of Potter's slabs, examples of concrete ceilings, specimens of work executed from the designs of well-known architects, all handled with skill. A new kind of wall-building in concrete shows panelled slabs and concrete backings scribed to stud work. An instance of its use may be seen in the oblong gables and tower built in Highbury Quadrant. Mr. Lascelles also shows, among other exhibits, good examples of concrete chimney-pieces, in the Jacobean, Queen Anne, and Early Georgian Domestic styles. The woodwork objects will be noticed elsewhere. This stand will well repay a visit on the part of both professional and ordinary observers. Messrs. Charles Drake & Co., Railway Wharf, Battersea (Stand 103), have an attractive display of objects in concrete materials. Among others, are marble concrete baths, window-heads, copings, terminals, steps, fire-proof floors, doors, staircases, wall tiles, and a great number of other ornamental and useful building forms. This firm also exhibit a concrete building apparatus. The dovetailed self-fixing building slabs, and the marble and granite facing bricks, are worthy of notice. The display as a whole is very good. The Eureka Concrete Company, Queen's-buildings, Queen Victoria-street (Bay 26), have on view a great variety of concrete steps, sills, stringers, balusters, fire-proof floors, mantelpieces, thresholds, copings, &c. The concrete four-panelled door, hung in position and in action, fitted with lock, &c., will surprise many visitors.

Mr. Henry Faija, C.E., Great Queen-street, Westminster (Stand 157), presents some good samples of concrete hardened by the exhibitor's new patent process. Samples of concrete only two days old show considerable hardness. The process is very well worthy of attention. Mr. J. Tall, Lordship-lane, Dulwich (Stand 49), illustrates concrete construction by a portion of a cottage. The other exhibits are indestructible door and window frames, drawings of concrete villas, and concrete building apparatus. Messrs. Hodges, Butler, & Dale, Thames Silcock Stone Works, Bridge-street, Westminster, and Greenwich (Stand 50), exhibit numerous specimens of "Imperial Stone" coping, window-sills, steps, coal-plate stones, silicated stone sewers, and water-pipes, with other applications of artificial stone. The assortment is varied and good. There are some other exhibitors probably, but they were not in position on the occasion of our visit, and some of those who may be omitted in this section will be found under artificial stones in another place. We have had some difficulty in finding the stands of several exhibitors, who, owing to their late application for space, had to be stationed, some in the galleries, and others distant from their former positions and kindred exhibitors.

#### III.—WOOD-WORKING MACHINERY AND BUILDERS' PLANT.

Although some of last year's exhibitors in this section have not put in an appearance this time, still their places have been supplied by others, and, on the whole, the display is a good one, and includes a large number of efficient machines, and some with improvements. Messrs. F. W. Reynolds & Co., Acorn Works, Blackfriars-road, S.E. (Stand 152), present, as usual, several excellent wood-workers, and as usual, several excellent wood-workers, and converters. The assortment includes sawing, planing, moulding, mortising, and tenoning machines. The new speciality of the firm is a panel-planing and improved thickening and moulding machine. The improved trying-up, thickening, and moulding operator possesses the advantage that all the processes can be performed on the one combined machine, without removal to the table of a separate operator. The remainder of the machines include saw-benches, bandsaw-machines, vertical-saw frames, and converters, driven by steam-power, with others suitable for hand-power. The machines are efficient in action, and, as specimens of engineer's work, are characterised by a good finish. One of the firm's own steam-engines supplies the motive-power to the other machines.

Messrs. W. E. Smith & Co., Ashburnham-road, Chelsea (Stand 151), exhibit a large number of the usual description of wood-workers, including a few with improvements. One of these, worthy of notice, is an improved four-outer moulding and planing machine. The advantage here is that the four sides of the scantling for the intended moulding are operated on at the one time. A moulding, 8 in. by 3 in., can be turned out finished. There is a variable feed motion and counter-shaft complete. The combined jointer's saw and vertical spindle moulding machine comprises an irregular moulding and shaping machine for curvilinear work. There is also shown, among several other machines, a rebating, grooving, tonguing, mortising, tenoning, cross-cutting, bevel-cutting, and ripping saw-bench, with suitable fences and adjustments for convertible operations.

Messrs. Charles Powis & Son, Gracechurch-street, E.C., and Millwall-pier (Stand 150), show their patent and general joiners, and the "Universal," for planing, moulding, sawing, tenoning, mortising, &c., for which a gold medal was awarded. The assortment includes a variety of efficient operators, including saw-benches, bandsaw-machines, vertical moulding ditto, and improved timber-frame. This timber-frame is adjusted to saw logs up to 16 in., and fitted with deal-cutting apparatus to cut two deals, 16 in. by 4 in. A horizontal steam-engine, with governors and pumps, 10-horse-power, and an 8-horse-power improved portable steam-engine, with recent improvements, are on view.

Messrs. Henry Warr & Co. (late Warr & Lewis), engineers, Blomfield-street, London-wall (Stand 149), exhibit a selection of wood-working machines, including mortising, tenoning, boring, and panel-planing operators. The latter is provided with top outer block, and also with side outers, thus performing three operations, or rather doing three sides at one operation. This firm also exhibits three of the "Ord" patent gas-engines.

Mr. E. S. Hindley, Bourton, Dorset (Stand 148), in addition to his very good and simple horizontal and vertical engines and boilers, shows a number of saw-benches, some intended for steam and others for hand-power. There are five varieties of circular saw-benches exhibited, some with band-saw apparatus complete, for either steam or hand-power. The Standard Emery Wheel Company, Greek-street, Soho (Stand 147), exhibit a number of machines, which, though not wood-workers, more or less come under the denomination of builders' plant. Among these are patent saw-sharpeners, "ring" grinders, "race" and "vacuum" grinders, portable fan forges, lever trowels and rotary. These latter articles are compact in shape, and will be found useful for general blacksmiths' work, and sundry kindred trade purposes. There are also on view solid emery wheels, and a patent mixing machine for kneading any plastic material, such as putty, cement, mortar, &c. Messrs. Lewis & Lewis, engineers, Cambridge Heath-road, E., and Cannon-street, E.C. (Bay 18), show a number of good wood-working machines, comprising mortising, band-sawing, and rounding machines for shaping curtain-poles or other cylindrical forms. There is a useful improved circular saw-bench, for hand-power, including one 15-in. circular saw; the feed is self-acting. The band-sawing machines are noticeable, and one has two saws, and is adapted to be worked by the foot. Among other exhibits are a combined engine and mortar-mill, improved friction hoist for raising building materials, and a new patent gas-engine for small powers. The latter appears to be simple and efficient, as well as economical within the range of its powers. "The Builders' Co-operative Machinery Company (Limited)," St. Mary-axe, E.C. (Bay 17), display a number of wood-workers, some of which are noticeable. The assortment includes specimens of different makers. The list includes "General" and "Universal" Joiners, steam and hand-power band-sawing machines, wood-planing and moulding operators, self-feeding saw-benches, and band-saw machines. Messrs. George Wilson & Son, Victoria Machinery Works, Leeds (Bay 16), besides their look and latch exhibits, display a number of wood-workers, with other building plant and machinery. The No. 2 patent centre-motion mortising-machine is put forward as a speciality. This machine complete has six chisels, two drillers, and two screw-keys. The "Rack Mortising Machine" is fitted with eight chisels, three drillers, and two screw-keys. A combined circular and band-saw bench, with two saws, and a band-sawing machine with one saw, screw-key, and steam pulley are also shown. Among the other plant are efficient slate-boring and punching machines, flooring and bench cramps, and a Venetian blind-lath punching machine. Mr. C. D. Moninger, Clerkenwell-road, E.C. (Stand 52), has on view a large assortment of frame-saws, deal webs, pit-saws, cross cuts, and band-saws. Band-saws are shown from 1 in. to 6 in. in width, and circular saws from 2 in. to 60 in. The other exhibits include saw-sharpening machines, lathes, emery-wheels, belting-tires for band-saw pulleys, lubricators, engine packing, and a number of joiners' tools. The display is attractive and varied. In our notice of the sundry exhibitors of machines in this section, we are obliged to be brief in our details, as it is impossible, from the wide field covered, to devote space to elaborate description. The working capacity, action, and characteristics of several of the machines of the wood-working kind enumerated above were treated in a special paper in these columns last year, and to some extent it relieves us of the necessity of going so soon over the same ground. We may, however, shortly return to the subject again in review of the latest improvements in wood-working machinery.

#### IV.—JOINERY AND WOODWORK.

**Doors, Sashes, and General Joinery.**—Some of the old exhibitors in this department are again forward, but there are absent friends as we write who may or may not turn up before the close of the present week. Among those in position, and partly in position, are the annexed exhibits. Messrs. Esdaile & Co., Wenlock-basin, City-road (Stand 32), show, as usual, a good and varied display of doors and mouldings of English manufacture, and also Swedish mouldings and trellis work, and doors of Swedish and American make. There are also on view some good machine-made plasterers' laths, palley blocks, with and without iron bind.



ing, for building and kindred uses. The doors and mouldings are of various sizes, and finished joinery work is cleanly turned out of hand. In an adjunct to this stand specimens of what is called "pliable wood decoration" are shown. The term might be better chosen, as cuttings or thin veneers about the thickness of ordinary shavings form the pliable covering of decoration for laying on or wrapping around other wood. A number of cylindrical pieces of red or other deal can be skilfully veneered with this pliable decorative veneer, and the specimens on view, showing wood of various fancy kinds, are well executed. Messrs. H. Atkinson & Co., Wharf-road, N. (Stand 25, South Gallery), display a good assortment of doors, sashes, mouldings, skirting, and general joinery work. A speciality in connexion with this stand was to be a Swedish wooden or timber house; but it was not in position on the occasion of our visit, though hourly expected. Mr. W. H. Lascelles, already mentioned in a preceding section, exhibits several fine specimens of joinery work in old domestic styles, including deeply-moulded sashes, doors, architraves, pedestals, &c., all solidly put together and highly finished. There are also on view specimens of solid and ornamental joinery work in the form of a length of handrail apparently intended for the circuit of a well-hole on a level landing, and a fine specimen of cylindrical sprandrel framing, well panelled and moulded. The joinery specimens briefly mentioned are worthy of examination for the skilful handicraft they exhibit. Messrs. Vernon & Ewens, Westminster Chambers and Cheltenham (Stand 132), exhibit this year some excellent specimens of panelled doors, including an oak seven-panelled door, a vestibule door in pitch-pine, drawing and bed room doors, all of which evidence good handling. The Queen Anne porch and door designed for Bedford Park by Mr. E. J. May, architect, are specimens of joinery work in the mode peculiar to the locality. The exhibits as a whole are good and well selected. Messrs. J. Eberhard & Co., Edward-street, Hampstead-road, N. (Stand 44), have on view several fine specimens of parquet flooring, applicable to various floors, whether of stone, concrete, or wood. This firm also show door and dado panelling, newels, balustrades, handrails, &c., all commendable for good workmanship and finish. Messrs. Gillow & Co., Oxford-street (Stand in South Gallery) exhibit an attractive display of parquetry work, together with some cabinets, office, and domestic furniture and fittings. The parquetry examples are exceedingly good, and entitled to recognition.

**Shop Fronts, Fittings, and Show-cases.**—We miss the attractive stand that Mr. Frederick Sage, of Gray's-inn-road, usually presented. In this line there are none in this year's exhibition who display the attractive varieties of show-cases and shop furniture and fittings that characterised Mr. Sage's last year's show. Messrs. Thomas Hogben & Co., of Appold-street, E.C. (Stand 54), have on view a number of shop-fittings and air-tight show-cases, which, though limited in range, are commendable.

Mr. Henry Bessent, Wells-street, Oxford-street, W. (Stand 59), shows various specimens of excellent parquet dadoing of different designs. On this stand will also be found several fine examples of parquet flooring in fancy woods, including satinwood, mahogany, sycamore, rose-wood, and walnut. Some rich designs in teak-wood are also shown. Messrs. H. Webb & Co., Worcester (Stand 53A), exhibit what is termed "Webb's Patent Diachromatised Wood Blocks or Slabs." The pattern here runs through the substance, for flooring and wall purposes. Another patent embraces a method of decorating plankwork wood for sundry kinds of panelling, wall dados, furniture inlays, and other ornamental uses. The "Plankwork Decoration" it may not be amiss to add, are exhibited here for the first time. The methods used are suggestive of other adaptations and processes.

#### V.—SANITARY APPLIANCES AND FITTINGS.

**Warming and Ventilation.**—Messrs. Joseph Clift & Sons, of Wortley, show some attractive-looking glazed fire-clay stoves, suitable for use in show-rooms, conservatories, halls, school-rooms, &c. It is claimed for them that they are cheap, cleanly, and healthy. Messrs. Donlon's "Lambeth" radiating tile stoves are very meritorious on the grounds of economy, effectiveness, cleanliness, and beauty of appearance. We are not surprised to hear that they are being

largely used, and the qualities we have named as appertaining to them, as well as the small amount of attention which they require, cannot fail to ensure for them a good future. For lulls, show-rooms, studios, and for many other situations, they are admirably adapted. Mr. Wm. Stobbs, of Queen Victoria-street, shows the "Crystal Heater," an American stove for burning coke or anthracite, and very suitable for use in halls for the warming of the air in staircases. The "Kyrle" grate, also shown by Mr. Stobbs, and made by the Coalbrookdale Company, is worthy of attention. It is constructed for burning anthracite. Messrs. Ashton & Green, of St. Mary Axe, have an admirable variety of slow combustion and other grates. One of their specialties is the patent "Harleston" ventilating grate. Another is the "Cambridge" grate. Both of these are eminently worthy of attention on the grounds of efficiency and economy. This firm's slow-combustion hall stove, specially adapted for burning anthracite, though it will burn ordinary coal with a small amount of smoke, is also well worthy of attention. Messrs. Steel & Garland, of Wharfedale Works, Sheffield, and Holborn Viaduct, again make a good display of good things in the way of slow-combustion and other grates, all characterised by excellence of design and finish. Messrs. Steven Bros., of Glasgow and Upper Thames-street, show (Stand 45) an excellent variety of slow-combustion, "Queen Anne," and other stoves and grates. Messrs. Walls & Co., of Shoreditch, make a large display of stoves and grates. Messrs. Deane & Co., of King William-street, London Bridge (Stand 121), exhibit Crane's patent register-stove, for burning anthracite or ordinary coal. It has before been noticed by us with commendation. The Coalbrookdale Company (Stand 38) are exhibitors of register-grates and dog-grates, including the "Iron-bridge Controlled Combustion Grate." They are all characterised by great excellence of workmanship. Messrs. F. W. Reynolds & Co., of Southwark (Bay 4), are exhibitors of slow combustion and other stoves, including some good and cheap tiled registers. Messrs. Clark, Barnett, & Co., show the "Kaio-Kapnos" stove, for the burning of coke, anthracite, or common coal. It is the invention of Mr. Ingram, an architect (we believe). It is so constructed that, under proper management, it will almost, if not entirely, consume its own smoke. It can be made with a chamber at the back, into which the external air can be warmed before being admitted into the apartment. The "Wagminister" slow combustion grate is shown by Messrs. Steven Bros. (Stand 45). Mr. William Addis (Stand 45) exhibits the "Waverley" and "Melrose" slow-combustion grates, and Messrs. Archibald Smith & Stevens (Bay 13A) show the "Wonderful" self-feeding grate.

Messrs. Robert Boyle & Sons have a good representative display of their well-known self-acting air-pump ventilators, which have been largely used, and as there is good testimony to show, with satisfactory results. A great merit which they possess is that they have no movable parts. It is unnecessary, however, that we should describe them in detail, but we may add that, being fixtures, they can be designed for situations in which they are exposed to view, with external casings or coverings in the form of a turret or *fiche* of architectural character, so as to add to rather than detract from the appearance of a building. This firm's chimney-cowl is also worthy of attention. Dr. Hall's patent ventilator is shown by Mr. Bostel, of Brighton, at Stand 122. Messrs. Ewart & Son, of Euston-road, are exhibitors of the "Empress" ventilator, which we have spoken of on former occasions. Messrs. C. Kite & Co. (Stand 10) show their exhaust roof-ventilators, of the great merits of which we have spoken on previous occasions. The Sanitary Engineering and Ventilating Company, Victoria-street (Stand 112), exhibit their "Imperial" self-acting exhaust ventilators, the "Imperial" ventilating tubes, a chimney-exhaust, and other useful appliances connected with ventilation.

**Water-closets.**—Messrs. John Bolding & Sons, of South Molton-street, are exhibitors of some admirable water-closets, one of the best and most serviceable being their "Simplex" self-trapping over-flow valve closet, in which the overflow is carried to the back of the valve (where it is impossible for any solid matter to enter it), and by connecting the overflow with the supply-pipe (above the valve) the trap of the overflow is flushed each time the closet is used, without interfering with the pan supply.

Banner's patent closet, all the parts of which are in white earthenware, and which is a modified but highly-improved form of pan-closet, is also shown by these exhibitors. In this closet the basin and pan are instantaneously removable, allowing of their rapid and thorough cleansing on both sides, as well as enabling the interior of the earthenware container to be thoroughly cleansed. A pan-closet of the ordinary form, but with an earthenware container, is also shown, as well as good hopper and wash-out closets. Messrs. Donlon & Co. are also, it is needless to say, exhibitors of some very good water-closets, including the "Lambeth" valve-closet, trapless and "wash-out" closets, and the "Lambeth" pan-closet, which is an improved form of that type of closet, with a strong stone-ware container provided with a ventilating-pipe. Mr. Bostel's Brighton "Exelsior" closet (Stand 122) continues in demand, and deservedly so, for, as we have stated on other occasions, it is very good and simple. Cross's patent "trough water-closet," so named by the exhibitor (Stand 106), is hardly a correct description, for instead of the usual trough, a number of hoppers or basins of stoneware are mounted upon a horizontal pipe. The flushing action is automatic, and the hoppers are kept charged with water, the discharge being capable of being regulated to take place at greater or less intervals. Messrs. Hayward, Tyler, & Co., of Whitecross-street (Bay 16A), exhibit their "fall-flush valveless closet," together with their patent flushing arrangement. These appliances possess some very good points, not the least of which are simplicity and cleanliness, even though complying with the restrictions of the water companies. Messrs. Smeaton, of Theobald's-road; Messrs. John Warner & Sons; Messrs. T. & W. Farnlie, of Westminster; and others, are also exhibitors of water-closets. The ever-inventive Mr. Lascelles, of Bunhill-row, shows a new patent earth-closet, which has a revolving wheel or chamber containing three compartments. This wheel revolves paddle-wheel wise, and has on one side of it a hopper for holding the earth, the pit for receiving the contents of each compartment as it is used and discharged being on the other side. It appears to be simple in construction, and unlikely to get out of order.

**Laminated Lead** for lining damp walls is shown by Messrs. Quirk, Barton, & Co. (Stand 21). It will be found very useful in some situations, as it can be papered over.\*

#### SOCIETY OF LADY ARTISTS.

As on previous occasions, the works hung in the Great Marlborough-street Gallery (746 in number) include many good and charming pictures, and may be safely recommended for a visit. Our chief lady-artists, however, still absent themselves, preferring to take their chance with the men at the Royal Academy and elsewhere; and it can scarcely be said that there is much change or advance in the general character of the collection. The place of honour must be given to 262, "London Bridge," by Clara Montalba, a characteristic specimen of that clever lady's art. "Sunny Moments" (228), by Charlotte J. Weekes, is another picture that will attract attention, as also should Mrs. Cooper's excellent case of miniatures (597). The artist has been fortunate in her subjects. Mrs. Murrable, as usual, sends a number of pleasing landscapes, foremost among which we must place (87) "Palm Trees and Fruit Sellers." Miss Rayner's old towers and buildings are always worth looking at, and are so especially on the present occasion. "Evangeline" (85), Mrs. Champion; "Cathedral, Cefalonia" (102), M. C. Wratlaw; "Pompeian Villa" (128), Emma Jennings; "Morning after Rain" (146), M. F. Kempton; "An Arab Chieftain" (165), Florence Reason; "Feast of Roses" (192), Mrs. Barnard; "Trespassing" Mrs. Whitlaw; "A Breath of Spring" Mrs. Alma Tadema (247); "Evening in North Germany" (282), Fanny Assenbaum; "Breakfast in Bed" (309), Louisa Jopling; "The Old Gooseberry Garden," Mrs. Paul Nattel (388); "Waiting" (588), Madame Giampietri; "Oxford Church" (644), Mrs. Val. Bromley; "Dear Lady Disdain" (655), Mrs. William Barnard; several frames of flowers by Mrs. Lukis de Gueric, have all good marks against them in our catalogue. Miss Edith Murrable, and some of the other younger members, are making good progress.

\* Continued on page 370.



## THE PHYSIOGNOMY OF MOTION.

THE observations in our last number on animal action in nature and art anticipated a communication on the subject of Mr. Muybridge's lecture from a frequent contributor to our pages, who has on former occasions called attention to the utility of the camera in furnishing lines of limitation within which the artist must work, in order to be truthful. We are not about to retrace the view of the subject, in which we are glad to find that the opinions of our contributor are quite in accordance with those which we have recently expressed. But it is well to call pointed attention to the fact, that while it does not follow that the effect at which the artist aims is to be secured by the delineation of a position momentarily assumed by a moving figure (especially if it be one of critical mechanical importance), it is at all events certain that the representation of an attitude outside of the series, so to speak, of successive positions, must be wrong. The painter must, because he is a painter and not a photographer, conventionalise. But he must conventionalise truly. Thus the rule, to which we have before called attention, that either the ear or the nose of a horse is, in almost any natural position of the animal, in advance of his fore-legs (which is verified by the recent photographs) is one which the artist can only neglect at the peril of the criticism of nature herself.

We fear, however, that those artists who, taking advantage of the information secured for them by the camera, for the next ten or fifteen years, try to draw horses as they actually move, must expect that same kind of condemnation from the public at large which was bestowed on an unpopular actor, who dared to compete with a favourite of the day in imitating the squeaking of a pig. The old favourite was applauded to the echo,—the new man was hissed and howled at, as in no way giving the true effect of the voice of a pig. And yet it was a real pig, concealed beneath the actor's cloak, whose voice was thus condemned as un-pig-like.

As to the horse, then, Mr. Muybridge has only confirmed observations which we have long ago ventured to print. But is there not something further to be asked of the new method? In this case an expected result (expected, at least, by one or two artists) has been obtained. How about *l'imprévu*? Are there no further surprises in store for us? We venture to think that there may be. The human figure has been studied much more generally, and probably more exactly, than any animal type. We do not deny (though we are not aware that it is a fact) that great artists may have made equally accurate studies of the osteology of the horse. But we know what has been the care devoted to human anatomy. R. faelle and Michelangelo were accustomed (as we are well aware) to sketch their most important figures in the skeleton, to build the muscular upon the bony platform, and, last of all, to throw the drapery around the figure. We can cite the instance of the figure of Christ in the cartoon of the miraculous draught of fishes, of which studies in these distinct stages exist. Anatomical models by Michelangelo are to be seen at South Kensington. We are thus fully prepared to admit that the proportions of the human subject, the articulation of the limbs, and the play of the muscles, are so familiar to the real student, that there is small excuse for bad drawing of the human figure. Then, again, we have the great advantage that the study of the nude is now easily within the reach of the student in this country. We are not sure how far any of the admitted authorities of the day will agree with our views here, which we, therefore, state with due modesty. But they are to this effect, and they are not formulated without definite experience. Half an hour of the study,—what shall we say?—half a minute,—of the natural and unconscious nude, is worth a week of studio work, not for attaining accuracy of touch, but for grasping *motif*. A glance at the free grace and motion of the red Indian, at the perfect elegance of,—we will not say the surprised, but,—the espied bather, on the shores of Italian waters, gives a *motif* which can never be forgotten by the artist, and which no amount of study of a paid model could ever equal. In the same way we venture to think,—but as to this we are less confident,—not only that the study of the nude model is far more important for the young artist than the most accurate study of the skeleton; but further, that it is possible that a better educational effect may, perhaps, be produced by the

exclusive study of the live figure. That, however, we only suggest. We are inclined to believe it to be the case, but are by no means prepared to defend the view with any vigour if attacked. But what we are coming to is this.

Every man, woman, or child has what we may call a distinct physiognomy of motion. It is as characteristic as the physiognomy of form. The swing of the elbow, the toss of the head, the pride of the neck, the swan-like undulation, the firm martial stride, or the hesitating shuffle of the gait, each of these, to the accurate observer, gives an indication of the person as sure as that afforded by the features, and often recognisable at a greater distance than the traits of the face. What has the portrait-painter done to represent the physiognomy of motion? Have not some of our first artists,—we cite from memory Lawrence and Wilkie,—used "live lay-figures" to complete the portrait, of which the face only was drawn from the real sitter? And if any particular trait or trick of posture or of manner be attempted, is not the result generally a caricature? We could cite instances, but it is unnecessary. On the other hand, in the children of Millais, we see something of the physiognomy of motion. The idea is never absent in the works of Hogarth. But it is extremely rare as a general rule.

Here, then, we think the camera may come in as a means of instruction in figure-drawing. At all events, the subject is worth consideration. The course that we should suggest would be to take a series of instantaneous photographs of subjects remarkable for their movement, such as a graceful dancer, a firm and sturdy soldier, a timid and embarrassed young person of either sex, an unconscious child. Let a series of sun pictures be taken of each of them, so that, if required, they may be combined into motion by the instrument with the hard name. Let the set of views, and each view separately, be compared with a drawing of the same subject made independently by the artist. If the result of this comparison be not instructive, not to say surprising, we shall have made a suggestion in vain. If it be shown, on the other hand, that the portrait-painter has, in indicating the physiognomy of motion, held the mirror up to nature, it will be well to acknowledge the fact, and to do honour to the triumph.

The study of these serial photographs goes far to explain that want of something which is so painfully perceptible in most photographic portraits. The procedures of art are now more rapid than is the ordinary sense of vision. Time, we know, is required by the eye for the perception of a distinct impression. Were it otherwise external nature would appear to us as if seen through a series of rapid winks. It is the slow appreciation of the eye which combines a number of points into one flowing nerve. The study of this part of the subject is extremely subtle. But all the more likely is art to be benefited by its careful pursuit. To a certain school reproduction of nature is the aim of art. To another, and, we think, a nobler, school, art is the embodiment of the ideal of the artist, based, indeed, upon the facts of nature, but informed with a soul that elevates the mere outer form. This view of art is, we think, irresistibly supported by the facts now brought before our attention. What may be optically true is not, necessarily, pictorially true. On the other hand, what is optically false is, necessarily, pictorially false. Those who only see a paradox in this statement will hardly be prepared to accept the true benefit offered to them by the use of the camera, which is much the same,—to illustrate it from another department of thought,—as is that of *Mémoires pour servir to the historian*. The artist is taught by the camera what to avoid as impossible. The field is thus delineated, within which, not by the reflection of a moment's truth, but by such a combination of successive and linked positions as would occur in a space of time long enough to form a distinct picture on the eye as is possible only to the artist, the proper effect will be produced on the spectator.

We may add, that on the 17th current, Captain Abney, R.E., whose mastery of the camera is so well known, threw upon the screen at the Royal Institution photographs of spectra said to be taken in some small number of the millionth parts of a second. His object was, as he told his hearers, that Mr. Muybridge, whose presence among the audience he observed, should not return to America with the statement that we are behind our Transatlantic cousins in the art of photography. We

can only say that if the intelligence can be convinced of the accuracy of such a measure of speed, the imagination refuses to conceive it.

## POMPEIAN WALL DECORATIONS.

AMONG the remains of ancient art found at Pompeii, there are few, if any, which surpass in interest or value the wall-paintings and decorations there discovered in such abundance. Upon these precious relics of antiquity an important work has just appeared under the auspices of the German Archaeological Institute. The author of the work in question is Herr A. Mau, who has spent a long period at Pompeii in the study of the mural decorations, and the treatise which he has just published is spoken of in the highest terms by the best judges in Germany. Herr A. Furtwängler, who is himself contemplating a monograph of his own on the same subject, greatly praises the publication of Herr Mau, who has succeeded in classifying the Pompeian wall-paintings as belonging to several distinct epochs.

At the first superficial view all these paintings appear alike, but when they are studied and compared it becomes evident that there are essential differences between them. It soon appears that there are at least two distinct and leading groups, the heavier imitating real architecture, and the lighter consisting of fanciful decorations. It is strange that down to the most recent times none of the numerous observers of these works have paid any attention to these marked differences. Even those *savants* who have made a professed study of Pompeian paintings and architecture appear to have had no idea what a treasure had been preserved to us in the mere decorations of the walls. It is Herr A. Mau's merit to have been the first duly to discern and appreciate their value, and to distinguish the differences marking the decorations belonging to different periods. His "History of the Decorative Wall Paintings at Pompeii" is accompanied by an atlas or portfolio containing twenty plates, which reproduce in an excellent style of art, a number of the most characteristic of the actual wall-paintings found in the excavated city. These illustrations, in colouring and execution, are exact copies in water-colours of the originals, and are themselves models of what such reproductions should be. The artist who has executed them is Herr Likkard, and he has succeeded in producing a series of works of art which will be as welcome to the art connoisseur as to the archaeologist and student. Herr Furtwängler says that many a reader, when he turns over the twenty sheets in this portfolio, will ask in astonishment, "Can these things really have been in Pompeii?" Most who have paid any attention to the subject have been accustomed only to see the more glaring and extravagant decorations belonging to the last period of the city. Publications hitherto have been almost confined to the paintings of this period, which was a period of retrogression and decay. The specimens given by Mau and Likkard carry us into the older epochs of the city, and give us works not only brilliantly executed, but showing that the ancient artists spent a minute and loving care upon their work. The wealth of "motives" in these older decorations is astonishing. Doubtless, since Pompeii was dug out of its hiding-place, many of this class of paintings have perished unnoticed, as, indeed, it is to be feared is the fate in store for all these works sooner or later.

Herr Mau shows that the wall paintings of Pompeii are distinguishable into three great epochs, followed by the final or fourth period, which was one of decay. The works discovered permit us to follow step by step a perfectly regular and uninterrupted course of development extending from at least the beginning of the first century before Christ, down to the destruction of the city. First comes the serious, stiff, and stately "Incrustation Style." Here is no picture, no ornament. Nothing but the stucco imitation of the variegated blocks and slabs of marble meets the eye on all the walls. Pictorial representation is nowhere seen except in the mosaics on the floor. This prim style of decoration belongs to the period of the great palaces of the Ocean aristocracy, and of the large tufa portals and columns with their nice arrangements. The period when this fashion flourished was the second century before Christ. It was about 80 B.C. that it gave place to the so-called architectural style. This style began by representations in mere colour. It reproduced



in painting those variegated blocks and cornices which had previously been given plastically in stucco. Soon, however, it advanced to representations of architecture of constantly increasing richness and boldness. The effect of greater space and longer distances was aimed at, and hence columns are represented in front of the walls. Low walls are depicted with views of distant rooms or vistas extending to the open air. Sometimes the walls open sideways, affording the view of an entire street, while occasionally through a gable-crowned frame in the middle of the wall an outlook is presented over the more or less distant landscape, and its moving and changing figures. In this way large pictorial representations were by degrees suggested as decorations for walls. On the other hand, into the architectural style of decoration, which had more or less the appearance of reality, purely decorative elements gradually began to find their way. Reality and possibility began to be more and more disregarded and departed from, and decorations become more and more fanciful and imaginary. Many portions of walls thus become filled with what has no pretension to reality, but what is purely ornamental. Thus by degrees, about the commencement of the Christian era, the third, or so-called Ornamental Style of Decoration developed itself. The architectonic division of the walls is kept as in the preceding stage, but all appearance of reality is given up, and rich surface ornamentation takes the place of the more realistic imitative plastic work. Nevertheless, the style thus arrived at is not purely ornamental decoration, but the real contrast between the general architectonic groundwork and the superficial ornamentation is concealed by the fanciful execution of the latter, which makes the architectonic element look like mere ornament. In their minute delicacy and care of execution the walls painted in this style excel all others. At the same time they are very liable to degenerate into what is trivial. The final period is after 50 A.D., and the very numerous paintings belonging to this period strongly contrast with those of the earlier stages. In ornaments and in the treatment of the architectural parts they bear considerable resemblance to the bold and splendid works of the Second Period, but exaggerate its effects to excess. The prospects shown by side openings are here the rule; but in the wild confusion of columns, flights of steps, terraces, and so on, the idea of any representation of reality entirely disappears. While the Third Style tended towards a true and sincere ornamental surface decoration, we meet here with an undisciplined fancy and the abortions it gives rise to. This style introduces no new principles.

The sketch here given of the course of development of the different styles is traced in all its details by Herr Mau. The times and dates assigned are chiefly derived from the inscriptions (*graffiti*) scratched on the walls. The question whether the different styles of decoration were introduced to Pompeii, Herr Mau does not attempt to answer. It is certain that they were not originally produced in that city itself. They are found in Rome, but also in other places. In Braccio, in Catania, in Sicily, on the island of Capri, there are found remains of wall decorations entirely corresponding with those of Pompeii. Even in the North, in Vienna in France, and at Treves in Germany, they have likewise been discovered. There is, therefore, ground to believe that the styles exhibited in Pompeii prevailed contemporaneously throughout the Roman empire. Were they then invented in Rome? Or did a purely Greek development of wall painting precede that which we know took place in the Roman empire? Herr Furtwängler negatives this question. The Roman decoration was something new. Nothing similar had preceded it.

The development in the Roman empire is complete in itself. Its peculiarity is that it unites pictorial representation and ornament, and makes them one. All preceding wall painting, both that of the Egyptians and of the Assyrians, as well as of the Greeks, before Alexander was either purely ornamental or purely pictorial. The former was by far the less important of the two. It was also quite dependent on textile art, whose products it imitated. And it imitated them probably only because it afforded a cheap substitute for the real carpets usually hung up against the walls by the ancients. Regular wall painting among the ancient nations mentioned, however, was purely pictorial and indeed represented figures. Every one knows the decorations of Egyptian temples

and tombs, and of the Assyrian palaces. The like is seen on Etruscan tombs and with Polygnotus and his school in Greece. It is remarkable that the Middle Ages present a similar phenomenon. It was only the Renaissance which created a wall decoration resting on the union or amalgamation of the representation of figures or architectural subjects with pure ornament. The Renaissance was, however, led to this only from the discovery of remains of ancient Roman wall decorations. The architectonic element in the ancient wall decoration springs from the so-called first style. And this latter itself probably originated in the capitals of the Greek kings. There is an example of the imitation of this style in stucco preserved in the case of Pergamon, which must date at least as far back as the beginning of the second century before Christ. It may also be assumed, in Herr Furtwängler's opinion, that the second or Architectural Style of decoration likewise originated in one of the centres of Greek civilisation. At the time when this style first appeared, about 100 B.C., the only style of art prevailing was the Greek. But this second style corresponds entirely with the pictures with which the Pergamon excavations have presented us of the sculpture of that epoch—a bold, strong, almost savage spirit with a perfect mastery over, and prodigious application of, the artistic capital collected in the preceding epoch. Indeed, the forms and heads on the walls of that style with their wings, snakes, pointed ears, and horns, transformed into ornaments, remind us often in the most striking manner of the strange and extraordinary shapes of the giants of the Pergamon sculptures. The pictures of those walls were partly explained by Greek distichs, and point more clearly than any others to a Greek origin. The originating centre of this style appears to have been Alexandria, which was the headquarters for painting as Pergamon was for the plastic art in the Hellenistic epoch. This second style was, together with the Hellenistic sculptures, the last real creation of Greek art. Afterwards there came over this field a certain falling off. The savage, passionate, and excited element was avoided. Older models were sought out again, and the gentle, ornamental, and elegant came into fashion. Here, too, Alexandria appears to have taken the lead, but it was no longer Greek Alexandria. It was now subject to Augustus Cæsar; a provincial city of the Roman Empire. It is even not improbable that that ruler's personal influence may have had no little to do in determining the development of this style. But it remains probable that the style was started in Egypt, because all its ornaments are modifications of Egyptian models. In it we often find friezes with obviously Egyptian figures and animals with characteristic Egyptian impress; but besides these there is a whole series of small ornaments evidently drawn from Egyptian models. It is also an important fact, though not noticed by Herr Mau, that it is only textile ornaments, and indeed carpets, that are imitated in the "Third Style." This carpet style never pleased the Western eye. The Oriental flat decoration was not worked out to perfection in the West till the Byzantine influence had been felt. Of the "Third Style" the ancients appear soon to have become tired. Neither did the exact, correct, choice taste of Nero's time please men any longer. The reaction that set in led to the so-called "Fourth Style" so abundantly represented at Pompeii. This appears partly like a return to the rougher Greek style, only it is freely adapted to Roman taste. That which has been preserved in the way of wall-painting from the later Imperial times in addition to those of Pompeii, shows that the taste simply went further in this same direction, and there-with a steady decline and decay.

#### HEATING AND VENTILATING THE HOME OF THE SCHOOL BOARD.

A CONSIDERABLE sum of money has been spent in warming and ventilating the Board Room in the building on the Thames Embankment, but yet the members say, with Mr. Toole, "they are not happy." They are not warm enough on cold days, and suffer greatly from draughts. It may be remembered that when we went over the building to look at the arrangements we expressed our belief that they would be found insufficient. The complaints have been so loud at recent meetings that further steps have been resolved upon.

#### A FEW MORE WORDS AS TO THE ELECTRIC EXHIBITION.

THESE were, as we hinted in our last number, one or two exhibits at Sydenham to which we had no space then to refer, but as to which it would be just neither to the exhibitors nor to our readers to be altogether silent. We are now referring to Classes XII. and XIII.

First among these we desire to call attention to No. 300. This is an electric alarm and register of the fluctuation of water-level, by T. R. Brailford, which, it is stated, is adopted by the Conservators of the Thames at all locks on the river. Our main object in calling attention to it is with reference to the plan which we some time back proposed for the protection of the low-lying districts of London from inundation, by telegraphic warning of the height attained by the river at Sheerness, on those days on which inundation is possible. We are not prepared to pronounce any decided opinion on Mr. Brailford's method, as to which it will be desirable to have the verdict of the Conservators of the Thames. But in the interest of the poor inhabitants of the low-lying area, who have so repeatedly and so severely suffered from the unwatched rise of the Thames, we desire to call the urgent attention of all concerned to the mode of electric warning.

In fact, it would not have been a bad idea to establish a special class for those applications of electricity which are intended to prevent avoidable human suffering, whether from the fury of the elements, or from the clumsiness, neglect, or malice of mankind. We spoke before of fire-alarms and burglar-alarms. Messrs. Chubb show electric alarms fitted to safes, strong-rooms, and ordinary doors. Fyfe & Carle (No. 814), and B. W. Webb (No. 3394), exhibit self-registering money-tills. Professor Denis Monnier, of Geneva, and M. Léon Somzès, of Brussels, have striven to protect the miner by the warnings conveyed by electric energy. The former, under the name of the methanometer, has contrived an automatic analyser for the detection of fire-damp, composed of two parts, the analyser and the receiver. The former are to be placed in the galleries of mines; the latter, in connexion with them, in a central position, under the eye of the engineer. On the proportion of fire-damp becoming as high as nine per cent., the instruments form an alarm signal; and it is claimed that the effect of ventilation on the point of danger can thus be accurately watched from a place of safety. It would be unfair to hazard any hasty judgment on the merits of an invention (as far as the details are concerned) that is intended to confer such a boon on the miner. But we are desirous to call to the subject the attention of those who can submit an elegant theory to the rude test of practice. M. Somzès proposes to arrive at a like result, taking as his starting-point the rise of temperature in the miner's lamp, due to the presence of fire-damp in the air. There is no lack of the inventive faculty displayed by the proposal of six distinct methods of effecting this important object. At the same time, we cannot but think that it would have been more desirable for the inventor, as himself the best critic of his own inventions, to select that method which he thought the best, and to devote his time and thought to its perfection, rather than to allow his imagination to wander over a six-fold field.

We should note, with reference to this important question of the application of electricity to mining, Mr. Crompton's pattern miners' lanterns (No. 203) and those of the Swan Electric Light Company (No. 226). It struck us that one of these new safety-lamps was too large for the convenience of the miner, and also too easily upset, if placed on the ground. To the latter objection the reply was at once made, that it did not matter with an electric lamp in what position it was held. That, we take it, is the case. But, if so, such a valuable characteristic should be grasped by the designer as one of the first elements of a miner's lamp. As such, we venture to think that all the metal work (unless it be by way of protection to the glass), should be placed at the bottom of the lamp, and that a globe or bulb of glass should form the upper part. The irradiation of the roof of the workings would thus be much better than when the metal work of the lamp is fixed, as in those we observed, at the top. Of course the great difficulty here is the connexion with the source of energy. It has been proposed that a small battery should be so prepared as to be carried



on the back of the miner. So long as he had to carry his lamp in his hand this would, no doubt, answer admirably. But when it comes to the use of the pick, the inconvenience of any wire connexion must become apparent. We should be glad to learn from any of those who have made a special practical study of the subject, how far it would be possible, with due regard to weight and bulk, to combine a Faure accumulator, or other form of storing electric energy, with the lamp. By that means, unless bulk and weight prove unmanageable, a safety-lamp of extreme value might possibly be produced. But among thirty-seven English and thirteen foreign exhibitors of lamps, we only observe two who have taken up the cause of the safety of the miner.

Another branch of the subject, in which the electrician comes forward as a minister of Art, is the engraving of hardened steel by means of voltaic electricity. All those who are interested in the work of the etcher or the engraver should visit the specimens, in the eastern gallery, exhibited by J. Hurly Pring, M.D., Enfield, Taunton (No. 326). Some of the specimens here shown were in the Exhibition of 1851, where, however, they attracted attention only as objects of fine art. As such, the inventor disclaims them; and he now presents them, not for their artistic merit, but as examples of the results of a process of extraordinary power, of the full application of which it would be rash to predict the limits. A steel plate, sword-blade, razor, or other object to be engraved is attached by means of a wire to one extremity of an electro-magnetic arrangement, while another wire coming from the opposite pole serves the purpose of a graving tool. The electric scintillations produced by the combustion of the steel are said to be very beautiful. Certainly the bold, deep, clear lines engraved are very good. And the power that is thus given to the artist to sketch freely on steel,—using the electric point with the freedom of the chalk pencil, and at the same time with the permanent result of the burin, is calculated, we think, to introduce a new and very admirable style of art,—quite as special as is the flowing outline sketched by the pencil of a master on the damp surface of pottery, in what is called *Raffaello ware*.

Last among the new and promising applications of electric energy to industrial art, we notice the Automatic Silk Reeling Machine of Mr. E. W. Serrell, of New York (No. 454). As to this, as well as with regard to the preceding exhibits of which we have spoken with most interest, we desire, once for all, to disclaim the functions of the jury. We conceive that the great utility of these exhibitions is twofold. First, the attention of inventors and of those who are in need of inventions is directed to what has been already done. Among these exhibits they have to study for themselves, and that the public writer can do to aid them is to save time and to prevent oversight by calling attention to the most remarkable or most promising exhibits. Secondly, and of more permanent character, is the outcome of the competition, as arrived at by the voice of competent judges. The cases are very rare in which it is permissible for the scientific press to anticipate this verdict. And certainly we desire it to be understood that our own remarks are to be taken *ad referendum*.

That understood, we cannot but recall the experience we have attained in silk-growing countries as to the extreme delicacy of the operation of unwinding the cocoons. These little balls are, in the factories, placed in pans of hot water, and the process of drawing off the unbroken thread is painfully slow. Mr. Serrell claims to unwind a thread at the rate of a mile in eight minutes; and says that this is the first successful machine of the kind, and that it bears the same relation to the silk manufacture that spinning machinery does to that of cotton. We hope that the claim will be verified. We are sure that there is an ample return for the mechanist in that case; provided, that is to say, that the essential reform of feeding the worms on the living trees, under temporary houses, be adopted. Not so much, in our opinion, for the sake of the animals,—at least in the first instance,—as for that of the trees. The constant stripping of the leaves, long so ruthlessly practised, has led to the disease and deformation of the mulberry tree; and we regard the silkworm disease as a mere outcome of the injury done to the plants. Either the young shoots should be treated as annals, cut with scythe or sickle, and then stripped of their leaves for the food of the worms, or the latter should be allowed to

crop their food on the living tree. We have no doubt that by either of these methods sound and good silk is attainable, and then, hey for winding it at a mile in eight minutes!

#### LICHFIELD AND ITS RECORDS.

It was on the 16th day of June, 1881, that the ancient and loyal city of Lichfield once again gave to the page of its local history an item of news which a large portion of the inhabitants would have gladly left unrecorded. On that day, while the grave councillors were debating in their ancient guildhall upon a proposed improvement in Dam-street, leading from the market-place to the cathedral,—in the very street where Lord Brooke met his unexpected death by the shot of a deaf and dumb Dyott," at the siege of 1643,—and while these worthy gentlemen of the corporation in this the nineteenth century were debating whether they ought to pay more than 12s. 10s. per yard for the 4½ yards of land necessary for the widening of the street, the mayor of the city informed his brethren that the sheriffs were "in possession," and that an officer was holding their property in custody,—even themselves,—for the trifling sum of 3,507l. 13s. 2d. (which included 90l. 11s. for costs of execution and sheriffs' poundage!) which they owed to Messrs. Pattinson! Of course, the corporation were compelled to pay the money and release themselves, for the law had for once got them altogether very comfortably in their own house; but the fact nevertheless remains matter for history, and we expect it is the first time that such an extraordinary event occurred in the annals of a city, and let us hope it will be the last.

But Lichfield, somehow or other, has gained for itself notoriety in more ways than one. Who can doubt its local affection after reading the return of the election commissioners of 1880? If there was anything comic in the fact of the bailiffs being "in possession" of the Guildhall in 1881, there was surely something very funny in the recorded events during the election for M.P. in 1880. One of these deserves a place. At a tavern on the Classic Green-hill in the city, "mine host" had suspended across the street a garland of true blue with the legend of "Dyott for Ever" upon it. Now the name of Dyott has been the Lichfield pass-word for centuries; but the opposition candidate had also partisans, and some hundreds odd of these determined to assault and take the garland by storm on the eve of the election. The record says that they marched to the place only to find that some bold Lichfield youths had kept guard throughout the night, "eager and ready for the fray," at the sight of which defending force, of less than twenty, the enemy, numbering at least six times as many, had a hasty retreat. And so the "garriens" with its "garlands" was left to enjoy its peace, its sumptuous breakfast, and, what is more, a march afterwards in strong force to record its vote at the election-booth. There may be some comic elements in history, but this election episode seems to us unusually so, and times have sadly changed since the Civil War period, for 120 men would never then have been scared at the sight of less than a score.

These recent events in connexion with Lichfield, together with the more worthy one,—the laying of the first stone of the new college to the memory of George Augustus Selwyn, its former bishop, at Cambridge, on the 1st of June last, and some more recent events, give us an opportunity of supplying a few interesting facts relating to the city, and a fitting supplement to the brief history which was published in the *Builder* on the 4th of January, 1879, and which historical notes having been widely quoted, lead us to believe that a few more will not prove unacceptable.

Without in any way repeating the history of the city as broadly told, we will add a few notes which may not be generally known to the citizens. For instance, there is a very curious picture of the manners and customs of the time of the reign of Edward III., described in an early petition in French among the public records. In 1342 two Lichfield merchants sent their servants with two horses loaded with mercery and spicery of the value of 40l. to the Stafford market. Highway robbery was far from an uncommon thing, and so, when Cannock Chase was reached, they were set upon by some "knights of the road,"—in this case real knights by title, one being Sir Robert de Rideware, and

another Sir John de Oddyngesles, and taken prisoners to Lappeley Priory. They then proceeded to Blythbury Priory, to which place the Lichfield authorities proceeded,—the day being Sunday,—where a desperate fight took place, ending in four of the malefactors being at once beheaded (they did these executions summarily in those days); but as the Lichfield "army" were returning home with the recovered property, Sir Walter de Rideware and others surprised them on the road, and again took possession of the plunder, leaving the bailiff and his company to seek redress at head-quarters,—Stafford. But the friends of the robbers prevented the petitioners entering the town, which necessitated the petition being forwarded to the Earl of Arundel, to hold an inquiry at the earliest session to be held at Lichfield. How it ended is not recorded, but it certainly exhibits a curious picture of the good old times,—more than 500 years ago.

In the reign of Henry VIII.,—in 1532,—we find among the state papers a complaint made by the fishmongers, that a quantity of salmon and other fish had been exported from Ireland to Lichfield, but that the sale was not valid through the absence of a lawyer at it! This is a curious note at the present time, now the question of the fish supply is being debated upon.

Queen Elizabeth honoured the City with a visit in 1575. She was very fond of a royal progress; and though the people paid for it, they paid cheerfully, for they certainly had the pleasure of seeing her majesty. Among the items in the City accounts of this year we find:—"Imprimis to the Queenes most excellent matie in gold, 40l. (40l.)." "For Keynege Madde Richard when her matie was here 5s." "To the ringers of St. Mary's Church, 1l. 4s. 0d." "For payntynge and mending the Gaylehall, 3s. 10d." (Guildhall). "To Six Men to go with the Queenes treasure to Rydegey 1s." (Rugby). "For beare, 12s." "For Victuals, 1l. 17s. 1d.; Salt fyshes, 6s."

But close upon three centuries since, at the beginning of the year 1583, Lichfield was in sore trouble about the chancellorship of the diocese. The ending of the dispute was one of the last of Archbishop Grindal's decrees. The whole diocese was then out of order. The dean opposed the bishop, the bishop opposed everybody that was opposed to the man he wanted for chancellor, and the consequence was, there were two chancellors in office at the same time,—Dr. John Bescon and Zachariah Babington; a state of affairs which was only settled by the archbishop exactly nine days before he died. In more modern times the late Chancellor Law was a good friend to the city, and let us hope the citizens will not forget to remember his benefactions by keeping his tomb in St. Michael's Churchyard in repair, and what is of great utility to the travellers by the rail, keep the clock above his tomb in good order too. That the chancellor was a favourite one fact will prove. It is the original parchment vote of thanks bearing the city seal, and now preserved in the Lichfield Museum, together with the original model of the statue of Dr. Johnson. Here is a copy:—

"At a common hall and meeting of the Council of the City of Lichfield, held in the Guildhall, on Tuesday, the 14th day of August, in the year 1838, pursuant to appointment and notice, the Mayor presiding, it is unanimously agreed that the most grateful thanks of the Council are due to the Rev. James Thomas Law, Chancellor of the diocese, for his munificent donation to the City of a statue of Samuel Johnson, which is a faithful characteristic and deeply interesting representation of their illustrious fellow citizen, redounding to the honour of the inhabitants as a just tribute to his immortal memory, and highly ornamental to the city as a work of eminent genius and skill."

JOHN SOLTZER, Mayor.  
CHARLES SIMPSON, Town Clerk."

In September, 1878, a plaster cast of the sculpture on this monument to Dr. Johnson, which is in the Market-place, was taken for a reproduction of it then proposed for erection at Uttoxeter, in the Market-place there, where Johnson once disobeyed his father, and where, in later years, he performed his extraordinary penance, and which is commemorated on one side of the statue pedestal.

Speaking of the Doctor, reminds us that we have a copy of an abstract of the names of the inhabitants of Lichfield, taken in the early part of Queen Anne's reign. Under the head of Sadler-row, at Market-street, where resided some twenty-four families, we find "Michael Johnson



Batchelor, 36 years; Andrew Johnson, widower, 32; Symon Martin, apprentice, 16; Ann Deakin, servant, 27." This Michael Johnson was the father of our doctor, and as he is described as a bachelor, this list must be of a date before the 19th of June, 1706, when Michael was married to Sarah Ford, at Packwood, in Warwickshire. The reminiscences of a past age crowded upon us when, through the kindness of Mr. Clarke, the tenant of Johnson's house in the Market-place, we took temporary possession of the little room (but little altered) at the back of the shop to which the city bookseller must have introduced his bride, and in which subsequently his illustrious son, so famous for taking his walk down Fleet-street, must have spent many of his infantile hours. It was also with more than ordinary pleasure we received the kind and courteous help of the many friends in the city who, throwing open to us a free inspection of the interesting records in their custody, enabled us to complete the valuable account which we now give to our readers.

First, then, we find by the registers of St. Mary's the baptism of the two sons of Michael Johnson, the Lichfield bookseller, whose house immediately faced the church. In September, 1709,—"Bapt. Sam., son of Mich. Johnson, gent, 7," 1712, October, "Bapt. Nathaniel, son of Mr. Michl. Johnson, 14." They are simple entries truly, but they have been viewed by countless numbers, who, from all corners of the world, have made many pilgrimages to Lichfield to see all that is to be seen relating to the author of the celebrated Dictionary and the world-renowned poet. The following entries from the St. Michael's registers give us official proofs,—if any were wanting,—of the burials of the father, mother, and younger brother:—1731, Dec. "13. Buried Mr. Michael Jonson, a magistrate of y<sup>e</sup> city." 1736-7, March "13. Buried, Nathaniel Johnson." 1759, January. "23. Bur. Mrs. Johnson, widow, aged 89." The three were buried in a tomb in the church, and over it was placed a stone, with an inscription, composed by the doctor. We should very much like to know what has become of this stone, and we know the present rector will. He has made every search for it. It was there in 1796, when, says Harwood, it was removed during the alterations. Alterations and restorations often destroy what money and time can never replace, and here is a glaring instance of the bad results sometimes of so-called "improvements." We next come to a very interesting matter. In the Salt Library at Stafford are preserved the original papers relating to the sale of the Johnson House, at Lichfield, in 1785. A brief abstract (taken by us, thanks to the kindness of the librarian) will, we are sure, interest. The house, it appears, sold for 235*l.*; a year's rent of it realised 12*l.*; and other receipts 5*l.* 5*s.* make up a total of 252*l.* 5*s.* Miscellaneous expenses (including 4*l.* 4*s.* to Mr. Cresswell, the auctioneer, 2*s.* 6*d.* a year's rent due to the Corporation for it; and 13*s.* land-tax) 36*l.* 15*s.*, leaving 215*l.* 10*s.* to be divided. Accordingly, 53*l.* 17*s.* 6*d.* were paid each to Thomas Johnson, Benjamin Johnson, William Whiting (and Ann his wife), and Mary Bill, which was in accordance to Dr. Johnson's will, and all of which signed for the same, 17th July, 1786. One important fact occurs in these papers. It has been hitherto stated the Corporation received 5*s.* a year rent; we now find it was the still more nominal amount of half a crown,—truly exhibiting the good feeling of the city towards the doctor, and respect for the memory of his father. Before bringing our Johnson notes to an end, it may be interesting to remind our readers that in Boswell's Life of the doctor occurs the passage that he (Dr. Johnson) wrote "Rasselas, Prince of Abyssinia," in the evenings of one week, sent it to press and published it, "that with the profits he might defray the expense of his mother's funeral, and pay some little debts which she had left." Strahan, Dodaley, & Johnston gave him 100*l.* for it, and 25*l.* more when it reached a second edition. This fact may be new to many who have read the well-known tale, and will give a good idea of how literature is sometimes produced under extraordinary pressure.

Next door to the Johnson house is a modern building which recalls a melancholy event. A terrible fire occurred in the house on its site in January, 1873, in which perished the whole family of seven persons, of the name of Corfield. They were buried in one grave, in St. Michael's Churchyard, and the tragic fate of the family was complete when, on November 1st, 1877,

James Corfield, the last of the family, met his death by a fall off the engine he was driving at Stafford.

At the Three Crowns, the inn where Dr. Johnson stayed when he visited the city, and which is next door but one to his birth-place, was established in 1787 the first of the Masonic lodges in Lichfield, and in 1794 the Female Friendly Society met here, a copy of whose rules is preserved in the city Museum.

Thanks to the present worthy Dean of Lichfield, the cathedral restoration is progressing quietly, and, we believe, surely; but we venture to think there are but few such public-spirited custodians of our cathedrals, seeing that in his zeal for the welfare of his beautiful church he made himself responsible for a large portion of the 30,000*l.* which the public had been asked to subscribe. Some thirty of the new statues for the west front have been placed in position, or about half the number designed to supply the place of those so wantonly destroyed in bygone times.

In fact, before the Civil War there were ninety-nine "fayrs statues curiously graven and carved in free stone, of kings, patriarchs, prophets, fathers, and apostles," and of these those that escaped the soldiers at the time of the siege of Lichfield were removed from time to time since.

Speaking of the siege reminds us of the disastrous effect it had upon this beautiful church. A reference to the guide-books will tell a sorrowful tale, but we think the following extracts from the journals of Parliament will not be without their interest. On the 14th March, 1642-3, two letters from Lichfield were read to the house, detailing the taking of the Close, and about 200 prisoners, and requesting a supply of money and horses, which being read and agreed to, the house "ordered, that Sir Edward Littleton and Mr. Noble do write unto the gentlemen at Lichfield, and return them thanks from this house for the great service they have done." It must be noted that Sir Edward Littleton was M.P. for Stafford county, 1640-6, and Michael Noble, M.P. for Lichfield, 1640-50. Of the latter gentleman's wife some curious notes are given in the *Builder* of January 4, 1879.

In 1648, the House of Commons, on July 9, desired Sir William Brereton to go down to Lichfield and assist in the siege operations; the next day, 5,000*l.* were voted; and on the 17th, 100*l.* ordered to be paid Capt. Padsey for bringing news of the surrender. Then came the crash; what the ruthless soldiers had not done, Parliament in time effected. On the 4th April, 1651, it was "Resolved that the Cathedral of Lichfield be disposed of for the use of the poor to set them on work!" It is true the building had by this time been sadly stripped of its valuables, and it is equally true that the Parliament quietly voted the sale of the residue, and of the money to be raised thereby one moiety was to be given to the poor of Lichfield, and the other to the poor of the diocese. Yet by its remonstrance in February, 1654, Stafford had not then received its 600*l.* of the proceeds. Of the condition of the cathedral, even six years later, we have good evidence, for early in 1660 the Michael Noble already mentioned, desired by his will to be buried "in the late Cathedral Church," while a note in one of the Ashmolean MSS., dated June 16th the same year, says—"This morning, Mr. Rawlins, of Lichfield, told me that the clerk vicars of the cathedral had entered the chapter-house and there said service, and this, with the vestry, was the only place in the church that had a roof to shelter them!" A year later, however, and the city had a new bishop. To John Hacket, Lichfield is indebted in more ways than one, and of the 20,000*l.* spent in the restoration of the cathedral, he himself gave 1,700*l.* And no one rejoiced more than he did when, on Christmas Eve, 1669, the restored building was dedicated.

Talking of bishops, reminds us that even Lichfield has had some peculiar representatives. A former dean of the diocese,—Thomas Wood,—succeeded John Hacket in the see, and held it from 1671 to 1692, but instead of taking an interest in the city, his interest appears to have been far away from it, for he actually resided at Clapton, in the parish of Hackney, Middlesex, where he founded almshouses, and left tokens of his charity there, at Oxford, and at Oxford, in Suffolk, where he was buried; but to Lichfield nothing, except the incomplete palace in the Close, which, in 1687, he commenced building, it is supposed, to appease the anger of the Archbishop, who had cited him to repair to his diocese, but which he had refused to obey.

His palace has only in recent years been tenanted by the Bishop, for all the early ones preferred Evesham Castle, which, it will be remembered, was sold a few years since.

The two last bishops of Lichfield, Lonsdale, and Selwyn, were each well deserving the appointment, and have left behind them names that will not easily be forgotten. John Lonsdale, the eighty-ninth tenant of the see, supported and carried to a successful foundation, the Theological College which the Rev. E. J. Edwards and E. T. Codd started, as a project, in 1852; and on March 6, 1863, he presided at a general chapter of the cathedral, which had not been held previously for just one hundred years.

Before closing these notes on the cathedral we cannot refrain from mentioning a very interesting MS. preserved in the Salt Library at Stafford. Mr. Mazzinghi, the obliging librarian, kindly favoured us with a look at it, and although too long to be given in full, we think an abstract will prove of more than ordinary interest. It is entitled, "Mr. Walmesley's account of the bells in the cathedral church of Lichfield, and of the Society of Ringers, called by the names of the Loyal Youths in the City of Lichfield, December 20, 1686." The orders are sixteen in number. The first Master was Richard Dyott, esq., and the Warden, Michael Lamb. Each member upon admission to pay twelve pence; to attend in the cathedral belfry every Thursday at five o'clock in the afternoon for practice, and if absent without cause to forfeit 6*d.* The Warden for the time being to keep the bells and ropes in proper order, provide oil and candles, tar the bells, towards the expenses of which each member shall pay twelve pence quarterly, and ten shillings among themselves yearly to Thomas Morgill; any member offending by swearing or otherwise misconducting himself to pay three pence. The fourteenth rule reads:—"Item, That the said Master shall upon the fifth of November yearly, if not Sunday, and when it falls out upon Sunday, the day following, provide the company a pease of roast beefe to be eaten at the house of the Warden, together with a bottle of ale to each member of the said society to drinke the king's health."

The plan of the cathedral in 1881, which was printed last Easter, and owes its publication, we believe, to the present Dean, assisted by the indefatigable clerk of the works, Mr. J. T. Irvine, is one of the most interesting broadsides we have ever seen. It is a perfect store-house of facts at a glance. It shows the ancient and modern parts of the cathedral, the position of all the monuments, the dates of erections, restorations, and everything interesting. From the year 1200, which the choir is supposed to date, to 1879, everything of interest is noted. But one curious fact we are told. The cathedral interior is not in a straight line, "there are no less than six strongly-marked deflections between the extreme west and extreme east of the building, corresponding for the most part to the different periods in which it gradually reached its present dimensions." The total length of the cathedral is 403 ft.; nave, 175 ft.; width of nave (with aisles), 65 ft. 8 in.; length of transept, north to south, 149 ft.; height of central spire, 252 ft.; height of south-western spire, 192 ft.

The south transept dates from 1220; north transept and chapter-house, 1240; nave, 1275; west front, 1275-1350; lady chapel and presbytery, 1300 to 1330; and the stained glass in the chapel windows came from the Abbey of Herkenrode, near Liège, in 1802.

The mother church of Lichfield is dedicated to St. Mary, and was rebuilt upon the ancient foundation 1855-70. It is the fifth that has been erected on the site, and has a lofty tower and spire. In fact, Lichfield is called the City of Spires. The monuments in the church are interesting, especially those of the Dyott family. The registers, too, are in good preservation, and to the kindness of the vicar, the Rev. M. H. Scott, we are indebted for a lengthy search through them. On the cover of the earliest one is given the weight of the eight bells in 1726,—80 cwt. 3 qr. 23 lb., the tenor weighing 19 cwt. 1 qr. 18 lb. There are also the names of thirty-nine persons who were touched for the king's evil "in y<sup>e</sup> middle quire of the Minister Church," 1655-7, and the names of fifteen children "born to discontents" between December 27, 1696, and February 26, 1728-9! The Ashmole family was associated with the parish from the earliest times down to within a few years ago. Th



registers commence October 5, 1566, and the first of the family is the marriage of Nicholas Ashmole with Margery Byrket, January 23, 1571. The entry of June 2, 1617, "Elias, sonne of Symon Ashmole, was baptised," records the baptism of the founder of the Ashmolean Museum at Oxford. On February 19, 1636-7, the "Sir Symon Weston, knight, buried," was the Recorder of Lichfield under the charter of James I., and succeeded three dukes of Somerset in that office. Among the curious entries are the following:—On February 9, 1684-5, "King James II. proclaimed King of England y<sup>e</sup> 9<sup>th</sup> at Lichfield, at four o'clock in the afternoon, with much rejoicing." On April 26, 1683, "two strangers of St. Michael's" were buried. On December 14, 1726, "Bapt. Richard, borne in the street of a stranger." On June 1, 1743, "Bapt. Richard, son of Thomas Slaughter, being y<sup>e</sup> first y<sup>e</sup> silver basin was made use of." February 8, 1776, "Bapt. Elizabeth, daughter of Mr. Joseph Penn (Player)." May 31, 1778, "Bapt. John, son of Margaret Maggill, a travelling woman." On the cover of the second register is written "Mr. Thomas Adey, magistrate, claims the place where Mr. Onion's last wife was buried."

St. Michael's Church is situate on Greenhill, and is also of an ancient foundation. It was restored in the year 1842, when the vault of the Earls of Donegal was bricked up. Here is preserved in a niche in the church the very interesting sculptured stone representing a citizen of Lichfield in the fourteenth century, which was discovered when pulling down a wall in 1846. The churchyard, which is the chief burying-place of the city, is the largest, perhaps, known, being 7 acres in extent. It is also of a peculiar marshy nature, although standing at a great height. Here, close to the high-road leading to the Trent Valley Station, is the celebrated clock tomb of Chancellor Law; here also, close to the church, is a remarkable grave-stone,—so remarkable, indeed, that it has puzzled many an antiquary. The original inscriptions, partly defaced, are on one side; the renewed ones on the other. The latter read thus:—

<p>Here lies the body of William Clarke who was Clerk of this Church 61 years and buried March 25 1536 and aged 61.</p>	<p>Here lies the body of William Clarke who was Clerk of this Church 71 years who died Sept. 26 1602 and aged 68.</p>
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Restored 1870.

These lengthy verses upon the face of these inscriptions are enough to take one's breath away, but unfortunately "Here lies" is to some extent correct. Of the clerk who died 1525 we have no evidence, as the date is at least a dozen years before parish registers began to be kept; but of the inscription number two we have a very decisive proof of its telling us the "lie" direct. Thanks to the great kindness of Mr. Sergeantson, who devoted much valuable time in gratifying our curiosity, we found the burial register to read thus:—"William Clarke, the clerk of St. Michael's Church, li<sup>e</sup> years, was buried the xxv<sup>th</sup> day of March, Anno Dñi, 1595." Here, then, the register proves that he was clerk fifty-two years, and not seventy-one years, as on the stone; and that he died at least thirty-three years later than the stone gave him credit for! Now we must suggest that in trying to read the nearly obliterated inscriptions, the dates and persons have been misplaced, for the first reads "Clerk of this church fifty-one years, and buried . . . March . . ."; and the other "Clarke of this church 7 . . . years, who died . . ." We had no time to search the register through, but a careful perusal might end in the first one being he who died in 1595, and the second one the clerk who died at a later date.

But our wonderment was not abated when the very next stone in the churchyard records,— "Here lies y<sup>e</sup> body of William Clarke, gent. Borne in Lichf. Lived in London. Clarke in y<sup>e</sup> Exchequer Office. . . ." Unfortunately the date is buried, but he must have been the William Clarke to whom his son William addressed the letters in 1678, which are now preserved in the Ashmolean Library, Oxford. The Clarke family must have been a noted long-life one in Staffordshire, for in the churchyard of Stoke-upon-Trent is a stone recording "Sibill Clarke, 1684, aged 112. Henry Clarke, aged 112." But the "hereditary" office of parish clerk has never been so clearly demonstrated as is shown by the records of Didsbury, Lancashire,

where the family of Wood held the office from 1591 to 1839,—a period of two centuries and a half!

We will now just take at random a few entries from the St. Michael's books likely to interest our readers, and not hitherto printed:—

1632. "Thomas Smalridge buried with a coffin, the 9th of October."  
1634. "A strange man that perished in the snow." January 31.  
1704. August 12. "Buried a child of John Bills, unbaptized."  
1727-8. February 14. "Buried Rebecca wife of William Finkerman, an actor."  
1749. May 29. "Buried a stranger and old soldier."  
1777. February 21. "Buried a spurious and adulterine child of William and T. Alsop and Jones."  
1779. March 16. "Buried a child belonging to the militia."  
1780. November. "Sepult. Ann, Countess of Donagall, from Fisherwick Park. 23d."  
1809. March. "Sepult. Joseph, son of William and Ann Harper, who was killed by a cow in the churchyard. 31."

In 1628 was buried Francis Wood, who in his will left this very commendable direction:—"Item. My will and mind is that my exors. shal be good unto my tenants, and not to putt them out of those things w<sup>ch</sup> they hold soe long as they paye their rent, and do as honest tenants should doe." In 1635, on March 18, 20, and 21, are four consecutive entries,—two baptisms and two burials of the name of Smith, three of the entries relating to three different families of that name! On August 30, 1704, occurs this very significant entry:—"Married at Homberwich Chapell, Richard Taylor and Mary Taylor, both of the parish of St. Botolph, Bishopsgate, London." Was it a runaway match? In 1728 was buried Alice Hayes, who (according to the tombstone) "fled from Popery and famine at the famous siege of Londonderry, A.D. 1689." In 1810 were buried (in one grave), as the tombstone informs us, "N. W. J., Lichfield, June 1, 1810,"—John Neve, aged 25, William Weightman, aged 26, and James Jackson, aged 48, who were the last persons executed in Lichfield for forgery. In 1870, George Mather, "for more than fifty years clerk, sexton, and ringer," aged 85. A Minton tile, with some curious emblems of his office, has been erected by the rector in the old vestry. And last, but not least, in September, 1879, was buried here Henry Littler, the head verger of the cathedral, whose unfortunate death caused a greater sensation in the city than we ever expected the quiet, immovable place to be guilty of. But, then, poor Littler was universally respected, and that is something, and a great virtue, too, in any city. Not far from his grave is that stately avenue of elm-trees so well known to visitors. The parish records tell us they were planted on the 26th of February, 1750, which, being "a windy Tuesday," gave rise to the saying hereabouts that the wind is always stronger at this place than any other in Lichfield.

We next paid a visit to another church, the ancient Stowe, dedicated to the first bishop, St. Chad (A.D. 669-672), who had his hermitage, it is supposed, upon the site, and subsequently founded the earliest Lichfield church. In a recent address by the present dean, upon "The Mercian Church and St. Chad," he reminds us that "a wide span of ages separates us from him; but a bright arch of eternal truth unites the Missionary Chad and the Missionary Selwyn." The old Stowe Church, a venerable structure, with a tower which looks as if it has not many years longer to live, has been a picturesque object from the cathedral close for ages. The vicar, the Rev. John Graham, kindly permitted us to "look around," and a look into the registers in which occur many interesting entries relating to the families of Bidolph, Dyott, Ashmole, and King. Of the latter family was Gregory King, the well-known Lancaster Herald, who was born in this parish in 1648, and was buried at St. Benet's, Paul's Wharf, London, 1712. The St. Chad's registers are missing for the dates between the 23rd of May, 1638, and the 28th of August, 1650, so we are unable to record his baptism; but the burial of the mother (and his father's first wife) is thus entered:—1668, April. "Elizabeth, wife of Gregory King, buried. 22." One of the valued manuscripts in our collection contains trickings of the arms in Lichfield Cathedral in 1663, which Young Gregory, then clerk to Sir William Dugdale, the well-known antiquary, executed for his employer. Among the curious entries in the

St. Chad's register is one dated 1676, the baptism, on the 7th of December, of Grace, Mercy, and Peace, the daughters of Michael Allen; but the two latter being buried the next day, Grace alone survived of the three. In the churchyard is a stone to George Houldsworth, 1812. "He was; but words are wanting to say what. Think what a husband should be: he was that."

Christ Church is a modern building, having been erected in 1845-7 by Mrs. Hinckley, the daughter of Dean Woodhouse. St. John's Church is attached to the hospital of that name erected 1495, and was restored in 1870-1 through the influence, we are told, of the Rev. P. H. Dod, the master; although the guide-book to the city, by the well-known local antiquary, John Hewitt (who was buried in the Cathedral Close, January, 1878), informs us it was to Chancellor Law, who was many years master, that "it owes its new life."

Within a few paces, behind the buildings in St. John-street, and extending to a line with the city conduit tower, is the friary and its grounds. Here was founded a convent of the order of Grey Friars, who came into England as early as the beginning of the thirteenth century, when they opened an establishment at Lichfield. The Grey Friars were, at first, called Franciscans, St. Francis having been their founder; then Grey Friars, from the habit or long grey cloak which they wore, the hood being made suitable either to cover the head or hold such provisions as were given them by the benevolent; a cord round their loins completed their dress. The friars depended upon the charity of the outside world, and begged their way on foot from door to door, whereas the monks kept themselves in close inside their monasteries and lived in common upon their own property. To this order several popes were very good by granting various immunities, among which the privilege of being buried in the Franciscan habit which would secure them from "the Evil One." The old friary was destroyed in the fire which burnt the city in 1291, was rebuilt, and finally dissolved by Henry VIII., in whose reign the present building was erected. From that monarch, the property passed through many private hands, one of whom, John Hill, in 1638, had a plan drawn of it (printed in Harwood's History of the city), and from here in 1640 addressed a letter to Elias Ashmole, Richard Johnson, a century and a half ago, devised it by will to the parish of Nether Seal, co. Leicester, and to the trustees of the manors of Chilcote and Stretton, co. Derby, for charitable purposes. In 1746 was discovered the old monumental slab now preserved in the east wall of the building. It records the memory of Richard the merchant, who, probably believing in the pope's privileges, joined the religious order as a safer way of getting to heaven! In 1779, two very interesting drawings were made of the friary buildings as then existing. One is taken from the west, the other south-west. They exhibit at a glance the whole range extending to St. John's, while the tower of St. Mary's and the cathedral spires are seen in the distance. These two drawings are, we understand, the oldest views of the friary known to exist, and are preserved in the collection of Mr. T. C. Noble, of London, who some time since exhibited them to the principal citizens of Lichfield.

Next to the friary gates was erected, in 1863, the conduit clock tower. The tablet on it says: "H. de Campanel founded the Crucifix Fountain, 1301, A.D." for the use and solace of the friars. Afterwards four conduits supplied the city with water, and about the year 1822 pipes were laid into the houses, and now we have reason to think it is one of the very few cities indeed which can boast of a water fountain outside and inside most of the tavern doors.

The celebrated Greenhill Bower is held every Whit-Monday. It is after the style of the Lord Mayor's Show in London. A procession of citizens, knights in armour, city heralds, bands, volunteer corps, &c., the festivities winding up with a cold collation in the Bower to all comers, and dancing in the Guildhall or Museum grounds. It is "the day of days" in Lichfield, and originated from the ancient custom of the View of Arms, to inspect the citizens' means of defence.

The city museum is placed above the free News-room and Library, opened April 26th, 1859. The building stands in enclosed grounds reclaimed from the oyster-bed of Sandford Pool, and facing the high-road. The antiquities preserved here are many and curious, including a fine collection of medals, tokens, and coins; also a large earthenware vase, inscribed "Lichfield



Conduit Works, June 16, 1711. In Nottingham made." There are some interesting portraits of celebrated citizens, and many varieties from Green's and Wright's old Museums in this city, so world-renowned a century ago. Next to this building is one specially appropriated as the district Court of Probate, which contains local wills and administrations from the year 1516. There are associated with this establishment those three graces which we should like to see in many other district Probate Courts,—civility in the officials, completeness in the arrangement of the documents, and cleanliness in the depository for their safe-keeping. Only those whose business compels them to make use of a district court for searching purposes can tell that these three virtues are absolutely necessary, and we hope the time is not far distant when the Lichfield court will produce good imitations. While here curiosity prompted us to "read" the oldest of the Shakespeare wills preserved here,—that of Christopher Shakespeare, of Packwood, co. Warwick, 1557. Now, we have heard a good deal about the way of spelling the name of the poet; but here, in this little will and inventory of a man whose goods and chattels were only valued at 49l. 6s. 8d., we find his name spelt three different ways,—“Shakespeare,” “Shaxpeare,” and “Shakspeer.” In the short will of a groom of H.M. Chamber, proved in London, 1608, we find a like deviation,—“Morrey,” “Morraye,” “Murraye,”—which clearly shows that pedigree-hunters should not be too fastidious how names were spelt in the good old times, and we could instance scores of such eccentric, or, rather, the careless, habit in which scribes indulged.

But one word more, and that will be interesting. What has been the progress of Lichfield as regards the census? That is a momentous subject at all times to a city, and yet it has not grown as other cities have. Exactly 100 years ago the city was carefully surveyed, and in 1781 there were in it 765 houses and 3,771 persons, and of these numbers 43 houses and 216 persons were belonging to the Close. In 1880, the population was 4,512. In 1881, the return just issued tells us that in the municipal and Parliamentary (or actual city) district, the houses are 1,681 and the population 8,360, being only 128 houses and 1,013 persons more than were there ten years ago! Surely not an excessive rate to travel at for a cathedral city. But let us complete the table. The superintendent registrar's district shows that in an area of 72,745 statute acres there were 6,591 inhabited houses in 1871, and 7,579 in 1881, while the population had increased from 32,165 to 39,261. But then these figures represent the surrounding parishes, and not Lichfield city proper. And the cause of the city not increasing in the same ratio with other cities would seem to be that it is neither a manufacturing nor, speaking commercially, a commercial town. When Boswell and Dr. Johnson visited it in 1776, the latter tells us “very little business appeared to be going forward. I found, however, two strange manufactures for so inland a place,—salcotils and streamers for ships.” And when Boszy accused Johnson (who was a native, please bear in mind), “You are an idle set of people,” our Sam replied, “We are a city of philosophers; we work with our heads, and make the boobies of Birmingham work for us with their hands!”

We heartily, however, congratulate the citizens upon some improvements, and we trust they will not be backward in carrying out others; some are yet urgently required. We are pleased to find that the gas-lighting is of a less eccentric character than formerly. Fifty years ago, it is true, the 250 to 300 oil-lamps were extinguished by two o'clock a.m. between September and April; in modern times the gas-lamps were extinguished at twelve, and when the moon was supposed to shine they were not lighted at all. We recollect, however, the “bo-twixt and between.” One night the lamps were lighted before dark, and the moon subsequently shone most brilliantly; the next night was a very dark one, and the lamps remained unlighted, and the inconvenience we experienced in our journey through the city we can amply testify. But within the past two years the lamps have been lighted every night, but extinguished at half-past eleven p.m. Then, again, there is another improvement. The post-service enables a correspondent to send off a letter to London at nine in the morning and receive a reply to it in the evening of the same day. It is never too late to mend, and one of these days we may hope to

see some encouragement given towards providing temperate amusements for those who fail to find amusements at home, and who wander through the highways and byways of the city, and stroll into its privileged places so freely licensed, because there is no other public establishment open to receive them.

#### ANCIENT BUILDINGS AT AMMÂN, MOAB.

ATTENTION has already been drawn by letters from Mr. Besant, secretary to the Palestine Exploration Fund, to important discoveries made by Captain Conder, R.E., of rude stone monuments in Moab, round Mounts Nebo and Pisgah. I now forward particulars of a very singular building on the citadel hill at Ammân (Rabbath-Ammân), at no great distance from the palace at Mashita, discovered by Canon Tristram, to whose work a very interesting architectural chapter as to the palace was added by Mr. Fergusson. The building at Ammân has also been visited by Canon Tristram and Colonel Warren, the latter of whom was enabled to take a good photograph of it, and to get a general plan of the remains of the city, which plan was published in the Quarterly Statement of the Fund, 1872, p. 66, accompanied by a short description by the Rev. A. B. Northey. Canon Tristram has also described the building in the “Land of Israel,” p. 588, thus:—“The interior architecture of the church, if not in the purest taste, is marvellously elaborate. It is faced with 120 small round-topped niches, each shallow, and the panels filled with carving of endless variety. No two are alike, either in the sculpture of the arch-heads or of the panels. Flowers, leaves, and fruits are the predominant designs, forming quite a pattern-book for Gothic decoration. The upper story is filled with niches of similar plan, but much larger, extending to the roof. Eight panels of leaves and pines, all in different patterns, occupy the faces towards the centre, and many others the limbs of the cross. The whole reminded us somewhat of the ancient church at Athens, though that is much poorer and on a smaller scale. The state of preservation of this building is truly marvellous.”

But these curious architectural details were not, unfortunately, drawn by him. Captain Conder has now supplied these, together with a photograph taken by the second officer in charge, Lieut. Mantell. The plan externally of the building is, roughly speaking, quadrangular 85 ft. by 80 ft. But internally it is that of a Greek cross, the centre part being occupied by an open court, 33 ft. square, in each side of which is a recess, 18 ft. wide and 18 ft. deep, arched over, but open to the court in front. The arches appear to be pointed. Three of the spaces completing the square are occupied by vaulted chambers, and in the fourth (north-west angle) are the remains of a staircase.

The large recesses are 33 ft. high to the apex. There are no remains of dome or other roof over the crux. The building has been variously described as having been a church or a mosque. The plan bears some resemblance to that of a Greek church, but differs from it in some essential particulars, and more resembles that of such buildings as the mosque at Broussa, whose date is known to be of the fourteenth century, or of Hassan at Cairo of the same date, or the new mosque at Algiers, built in the sixteenth century, both of which were designed by Christian architects for Mohammedan worship. There are special features in the building at Ammân which render it very interesting. In the first place, the great arches over the recesses and the wall spaces on each side are designed in almost exactly the same way as those of the Tak Kera at Ctesiphon, as shown in Mr. Fergusson's History, and to a large scale in Flandrin and Coste's “Persia.” This is assigned by him to the Sassanian period, A.D. 550, and the Ammân building, though very much smaller, is so like to it that no one, whether architect or not, can fail to be struck by the resemblance.

But the details at Ammân much exceed those of Ctesiphon in richness. To quote Captain Conder's words,—“The main feature is the elaborately-sculptured ornamentations of the inner walls, the style of which, as a whole, is quite unlike any sculpture found in Western Palestine.”

The ornament to which he refers consists mainly of panelling, as at Ctesiphon. But instead of being plain, as there, the semicircular

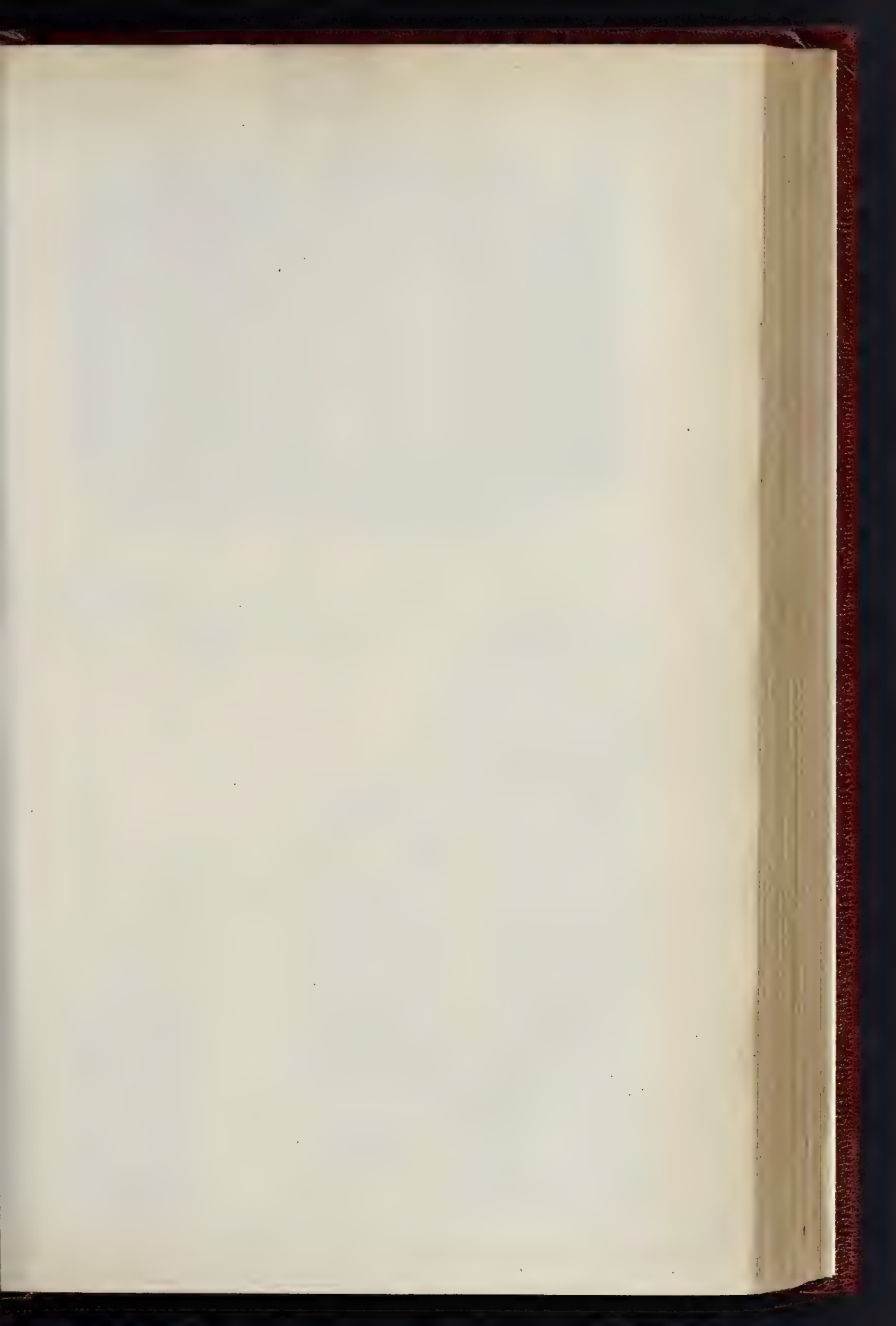
arches are much enriched, and the larger ones enclose others of distinctly a horseshoe form,—the panel having a centre mullion. The narrow lights thus formed are filled in with roundels, each having a rose or other ornament in the centre. Captain Conder notices that “there is an entire absence of any figures of animals.” As to “the vine-branches which occur in the interior of some of the panels,” several conventional vine patterns occur not only on the later Jewish tombs, when Greek art influenced the native sculptures, but also in Byzantine tombs and chapels of the fifth and sixth centuries in Western Palestine, and “among the details are a flat tooth moulding, which somewhat resembles the ornament applied by the Crusaders to arches in their early churches of the twelfth century, as in the beautiful west end of the Muristan, Jerusalem.” The architectural peculiarities to be noted from the foregoing statements are,—the general design, the horse-shoe, and (probably) pointed arches, the ornamental filling-in to the narrow lights, and the tooth ornament. The design appears clearly to have been derived from Sassanian sources.

The origin of the horse-shoe arch is not so clear, but we have several well-dated examples of it in the sixth and seventh centuries, as at Dana, on the Euphrates, and at Edessa, as described in Pullan's “Byzantine Architecture.” Another well-dated example has been kindly pointed out to me by Mr. Fergusson, viz., a Syrian MS. finished in 586, a copy of which is given in the splendid work of Garucci, and which shows horse-shoe arches within semicircular ones.

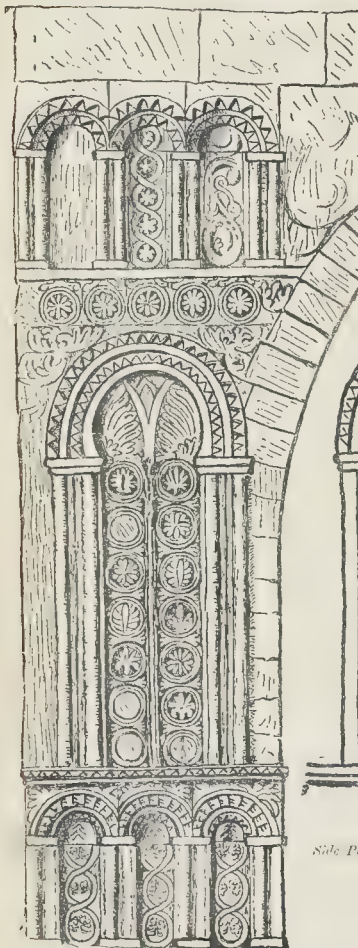
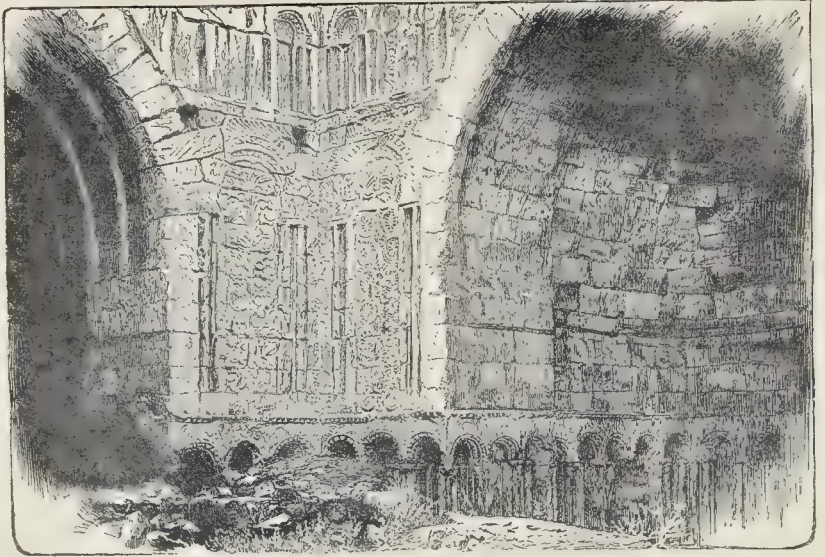
The filling-in to the panels at Ammân is very similar to that of the windows in many of the small Greek churches, e.g., the Cathedral at Athens, the date of which is supposed by Couchaud (“Eglises Byzantines”) to be the sixth century; whilst Mr. Fergusson considers the date to be of the eleventh, twelfth, or thirteenth century. From careful examination of these and other old Greek churches on the spot many years since, and again quite recently, I am in accordance with Mr. Fergusson, to whom I have given the reasons for my opinion. The part of the Muristan, at Jerusalem, to which Captain Conder refers, which I know well, and of which we have a fine photograph taken by Lieutenant Kitchener, is of the twelfth century. The result as to the Ammân building would appear thus to be that it was designed at a late period, in the traditional style of the Sassanians, with the horseshoe arches of the East (whatever their origin), the Byzantine fillings-in of the windows and peculiar ornament used by the Western nations in their twelfth-century work,—as singular a medley as is, I believe, to be found anywhere. Near to the above are the ruins of a mosque, the greater part of whose walls and minaret remains, and of which we have photographs taken by Colonel Warren and by Lieutenant Mantell. Captain Conder describes it thus:—“It is a typical mosque, resembling in plan the White Mosque at Ramleh, and measuring 183 ft. by 129 ft., built of finely-dressed stonework. The minaret is nearly perfect, and the staircase intact; two of the entrances have stone lintels under the arches. One arch is 7 ft. 6 in. span, the lintel stone 9 ft. long. Another has two lintels, each 15 ft. long. The stones appear to have been cut for their present purpose, and to have very little structural use. There are no traces of any inscriptions beyond a rudely-carved Moslem religious formula over the door, which appears to have been cut at a late period by an unskilful hand.”

The architectural interest attached to this is that these peculiar lintels were used in the early centuries A.D. in and about the Hauran, as may be seen in Count Vogüé's book on Central Syria, e.g., at Bozra. To show still further what architectural interest attaches to these countries east and south of the Dead Sea and east of the Jordan, I may mention that Professor Palmer describes in his report (to the Palestine Exploration committee) of his journey through the rarely-visited country through Petra to Beersheba, the finding great remains of the ruined city of Sebaste, supposed to be the Zephath of the Old Testament. The ruins are about 500 yards long and 300 yards wide, the streets still to be traced, and there are large remains of three churches, many of the walls being 20 ft. to 25 ft. high. “The houses are built of stone, and the want of timber beams has been most skilfully supplied, all the lower stories being built with arches, about 3 ft. apart and 2 ft. wide, long thick beams

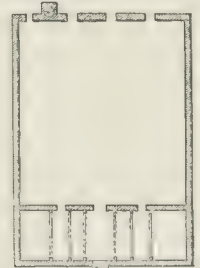




SMALL BUILDING AT AMMÂN: INTERNAL VIEW.—From a Photograph by COL. WARREN, R.E.

Side Porch, Small Building at Amman,  
to Larger Scale.

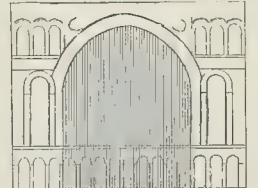
Mosque at Amman: Exterior View.



Scale 100 feet to 1 inch.

Mosque at Amman.

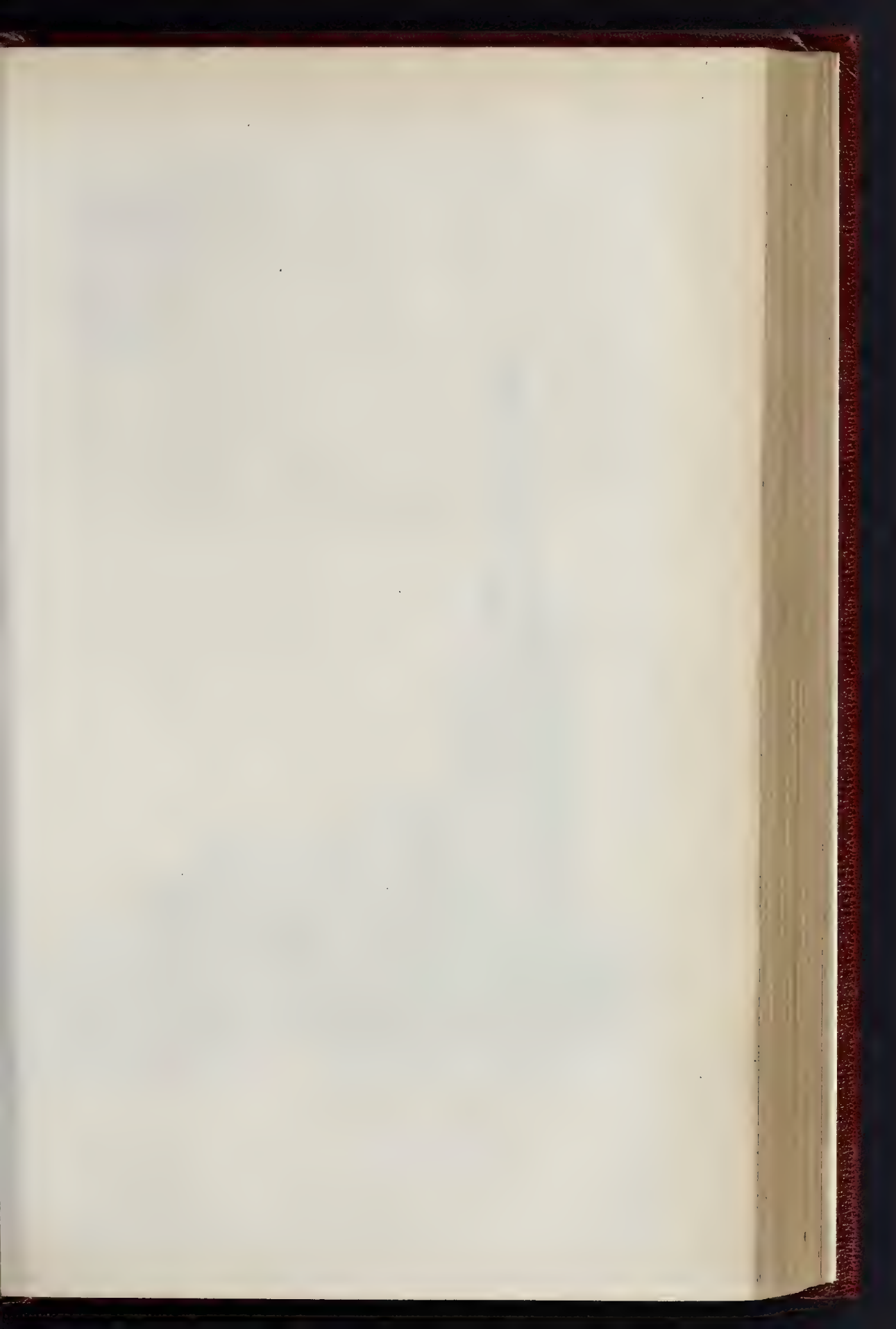
One Side of Court, to Larger Scale.

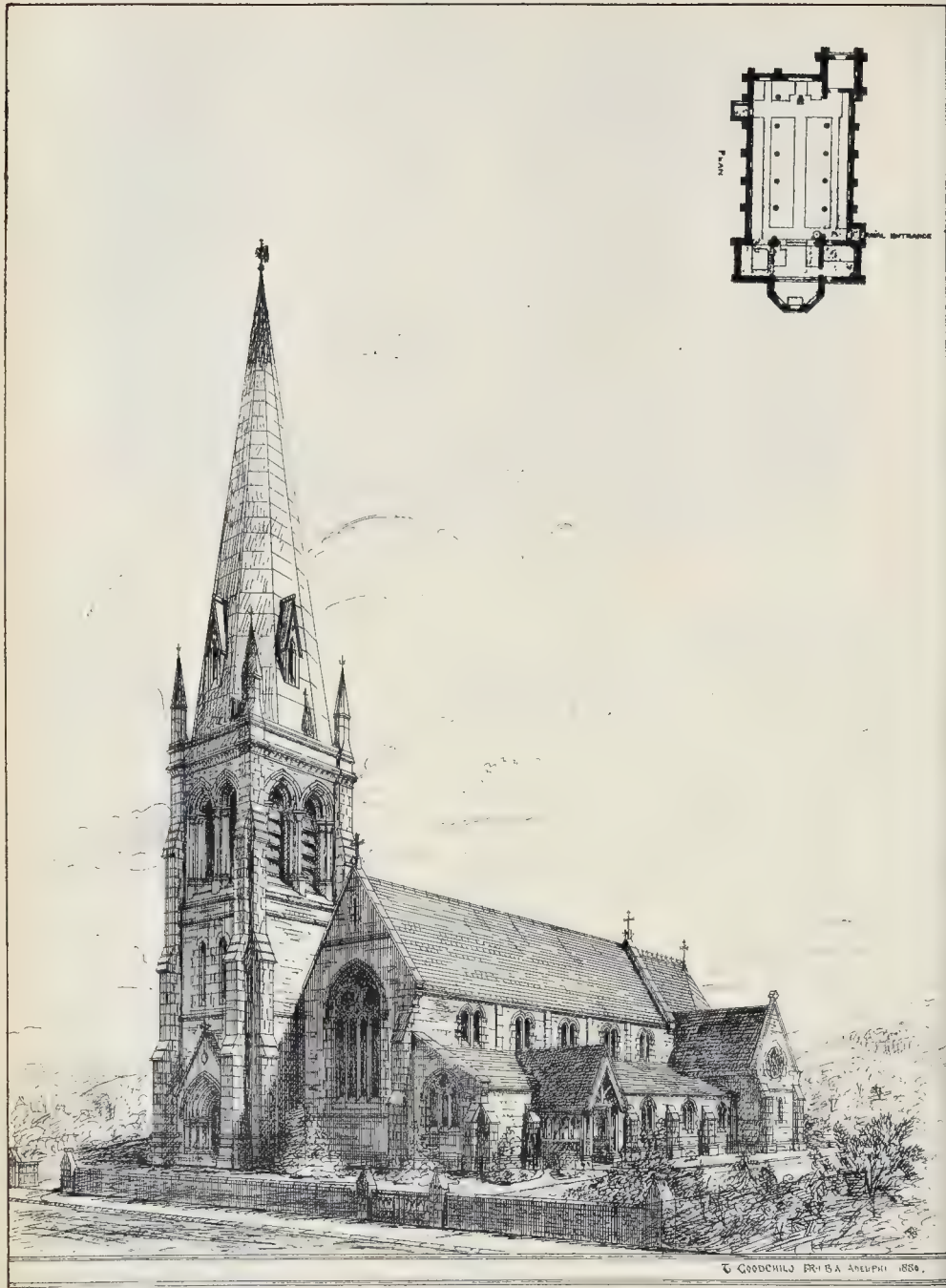


Scale 100 feet to 1 inch.

Small Building at Amman.

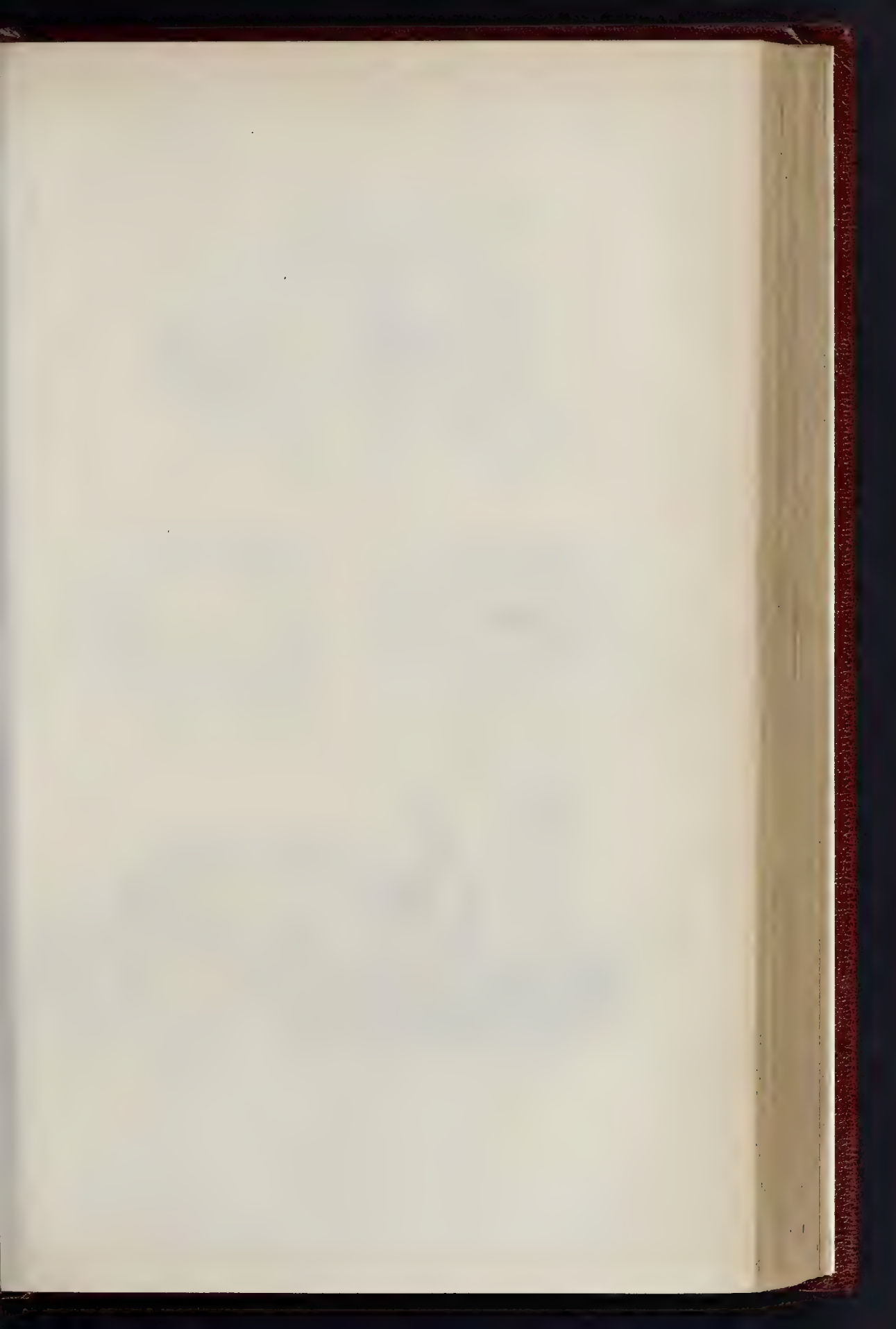


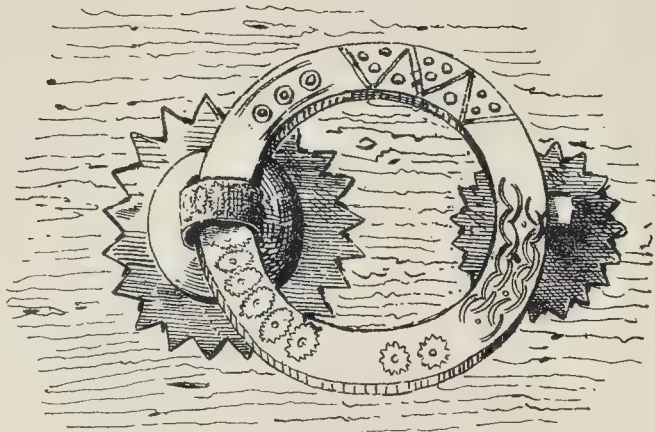
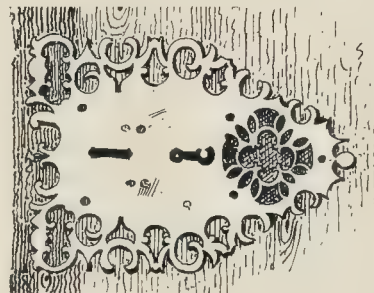
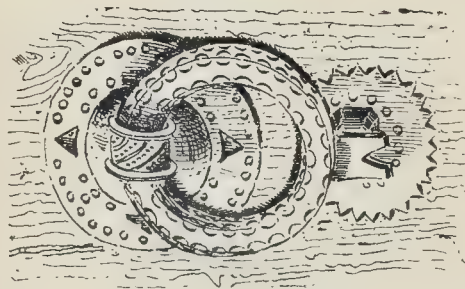




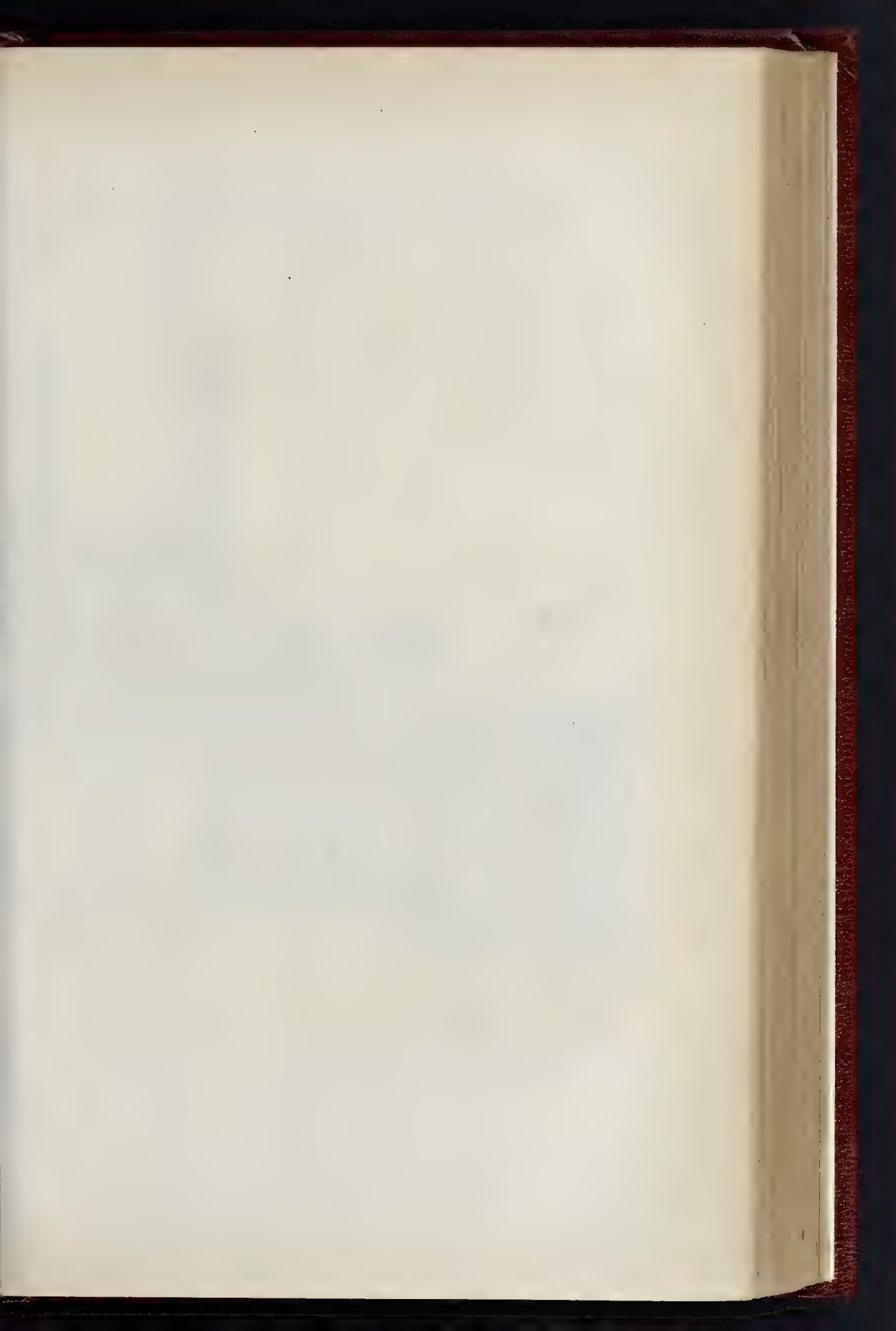
DESIGN FOR BAGSHOT CHURCH. SUBMITTED BY MR. T. GOODCHILD, ARCHITECT.

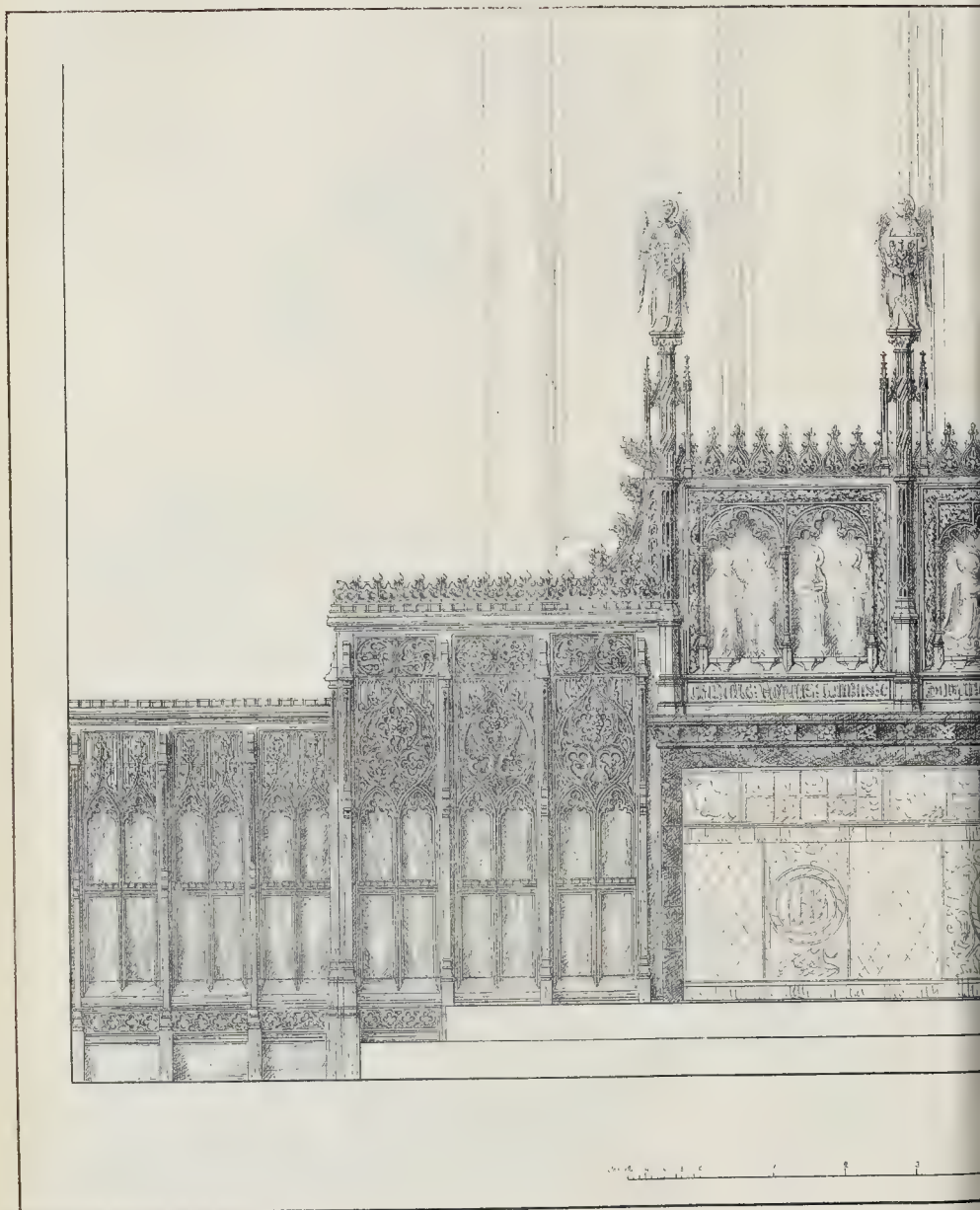






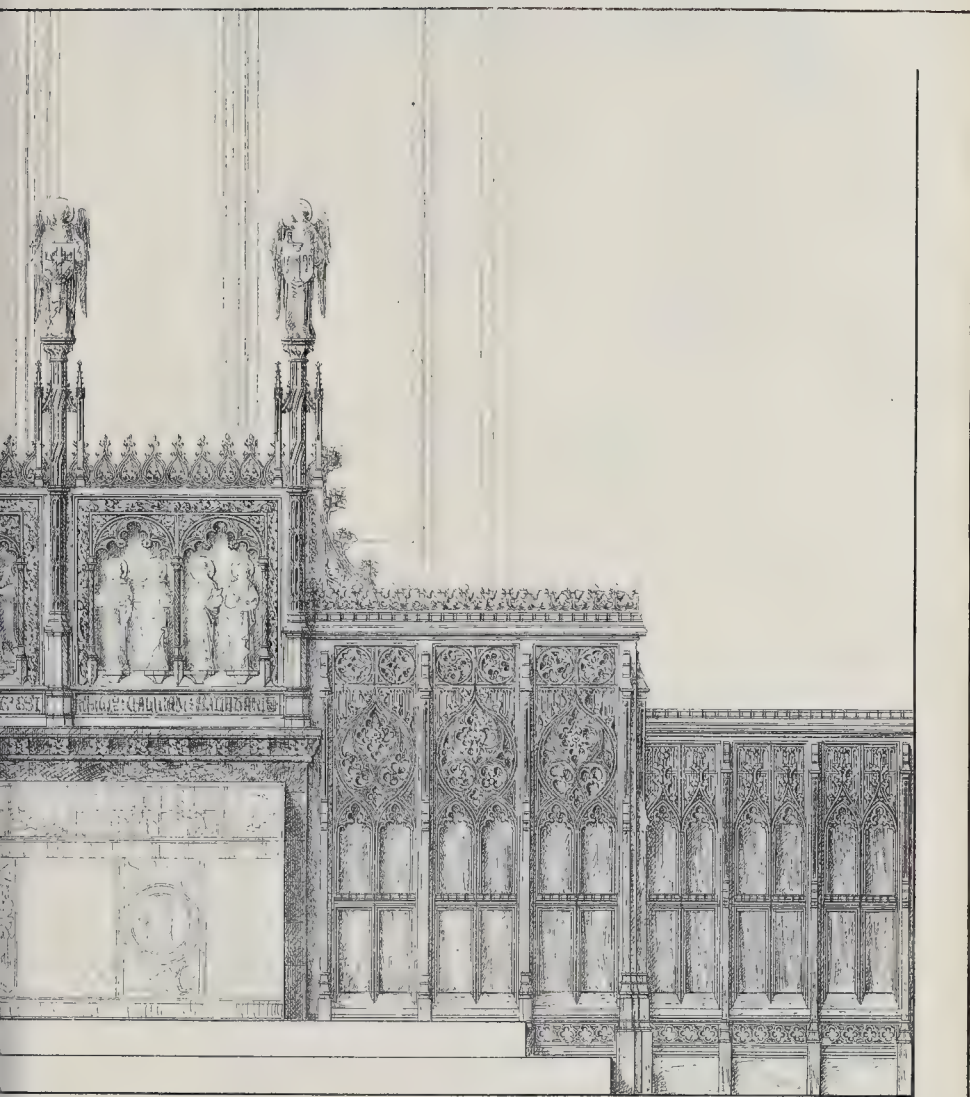






BANGOR CATHEDRA





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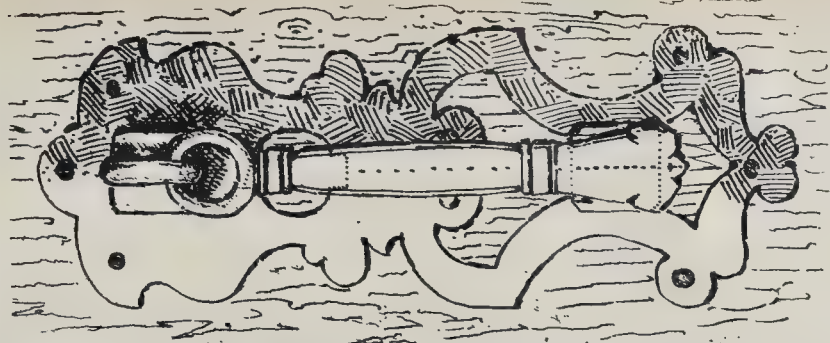
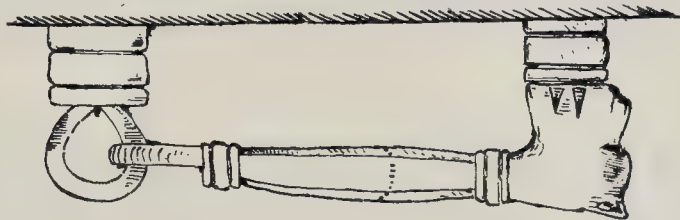
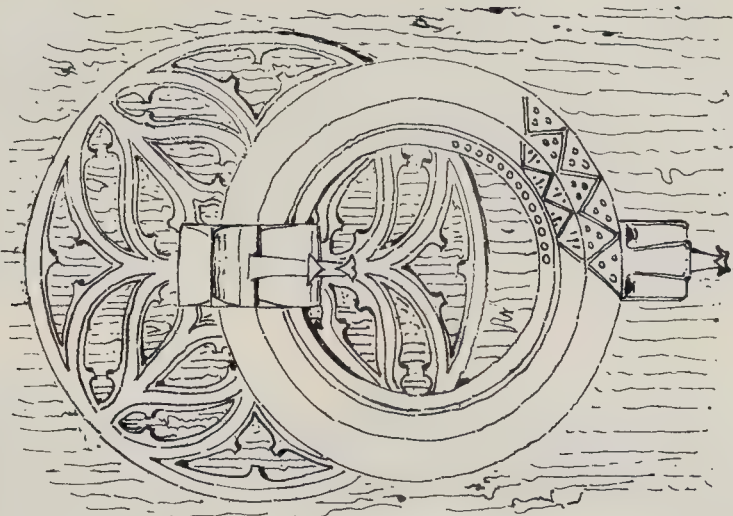
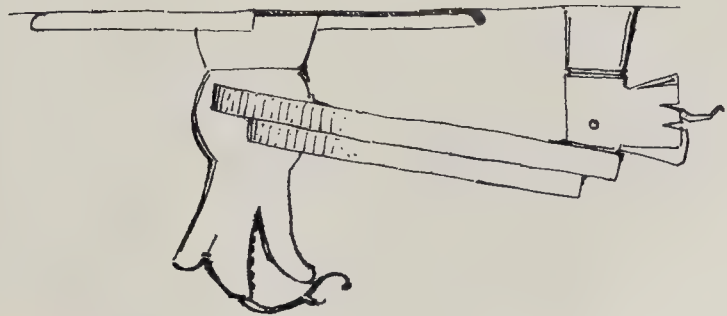
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### Specimens of Spanish Iron Work.

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UNIVERSITY BUILDINGS, FRANZENSRING, VIENNA.





of stone being placed across them." No one who has visited the Lebanon district, or read Count Vogüé's book on Central Syria, can fail to perceive that the style of building which characterises these northern districts was the style used also in Moab and south of the Dead Sea, and that there are several chapters yet to be written in the art-history of the past, when these wild districts have been carefully explored.

T. HAYTER LEWIS.

#### BAGSHOT CHURCH.

We continue the history of this competition by illustrating the design submitted by Mr. T. Goodchild, F.R.I.B.A., placed second by the building committee, and to which a sum of 10l. was specially awarded.

It is of the Geometric period of Gothic, and consists of nave, with clearstory, north and south aisles, choir and sacristy, organ-chamber, and vestries. It has a south porch, west doorway, and distinct entrance on the north side to the royal seats. A tower and spire are shown at the north-west angle, and as a sum of 400l. has been promised for bells, it is presumed that the erection of these would soon follow the erection of the main building.

The materials proposed to be used are local stone for the general body of the walls, and Bath stone for dressings, windows, arches, &c. The roof to be open-timbered in yellow deal, felled and slated, and Minton's tiles to aisles and chancel, &c. The church would seat 450 adults.

We understand a tender has been made by an experienced builder of churches to carry out the design for the sum to which competitors were limited, 3,000l., without, of course, tower and spire.

#### MOORISH IRONWORK.

On one of our sheets of illustrations we this week figure two Moorish knockers which were forwarded to Dr. Dresser by an assistant, whom he sent to Spain and Morocco to make drawings and photographs of all kinds of Moorish remains. The most interesting things resulting from this visit to the two countries, in which specimens of old Moorish work are chiefly to be found, were the knockers, door-handles, nails, escutcheons, and other works in iron, some of these being very interesting, as well as appropriate, to our own wants at the present time. This being the case, the Art Furnishers' Alliance, of 157, New Bond-street, have made reproductions of these old works, and those who are interested in metal work may there see not only these particular things, but many other reproductions of an interesting character.

On a second page, for further examples, we give sketches of three knockers and one lock-plate. In Spain we find both Christian and Mohammedan art brought together in a curious way, and often meet with "Gothic" knockers which were either the work of Moorish metal-workers themselves, or of men whom they taught. Two of the knockers now figured, and the lock-plate, are pure Moorish works; but the one knocker with the dragon-like centre is of Gothic character.

#### UNIVERSITY BUILDINGS, THE FRANZENSRING, VIENNA.

The Franzensring is the latest development of the whole Ring of Vienna. In reality, it is not yet what it is to be, that is to say, completed; and it will hardly ever be like the other portions, which show masses of buildings displaying some uniformity of architecture, and which have merely added to their special names the generic term, "Ring." The plans for the parts to be joined on to the old town had long been designed,—in fact, had partly been finished,—when the large reserved space, the "Paradeplatz,"—the name of which showed it to be devoted to military purposes,—gave way to necessity. The capital, almost daily growing in extent, required a town-hall, the empire wanted a Parliament-house, as well as a suitable *alma mater*, a university. The idea of uniting all those and other grand buildings on one spot, instead of inserting them here and there between houses used for everyday purposes, was a grand one, which gradually grew in public favour; and the large open space used for military shows had to be sacrificed. More than that, the name itself disappeared; but a space was formed of which

Vienna may be prouder than it was of its former Champs-de-Mars, especially as another sumptuous edifice was added, the Imperial Court Theatre. Thus the Franzensring unites within its bounds the grandest architectural specimens of the modern period of Vienna.

Let us see what the latter are. If we approach the Franzensring from the Burgberg, the eye rests first upon the Volksgarten, with its temple of Theseus, next upon the Court Theatre, and in the distance upon a number of newly-erected gigantic palaces. To the left the eye beholds, receding from the front line, the finely-membered Palace of Justice; before it, the Houses of Parliament, in the Greek style, forming a flank of the Rathhaus Park; and in this park the town-hall, of Gothic architecture, one of the largest buildings of its kind in existence, and of which we have given our readers a view. The other flank of the park is formed by the University buildings, in the Italian Renaissance, a view of which we publish in our present number. The building to the left is a portion of the town-hall.

All these are buildings already in existence, to which large additions are to be made in the near future. Leaving out of the question, however, what is to be, there is enough to afford a most enjoyable view. From the Franzensring may be seen in the distance, on the one side the Gothic Votivkirche, with its pointed steeples of white stone; on the other, the new handsome cupolas of the museums and the marble statues surrounding their high parapets. If we come from the Schottenring, we have the Votivkirche to the right, and behind the future tower of the town-hall, the domes of the University, the pediments of the Parliament House, the cupolas and statuary groups of the museums, and around us the quick pulsation of the life of a metropolis, the confusion of quickly or slowly moving vehicles of all descriptions, and the human element in its ever-varying forms, a picture constantly presenting to the eye a thousand subjects for contemplation.

#### REBEDOS, BANGOR CATHEDRAL.

We give a view of the proposed Rebedos for Bangor Cathedral. It is designed by Mr. John Oldrid Scott, and is the gift of Mrs. Symes, its cost being nearly 600l. It is of oak, which will receive sufficient enrichment in gold to harmonise it with the decorations of the chancel. The work is being carried out by Mr. John Thompson, of Peterborough, the sculpture being by Mr. Bridgeman, who has done many of the figures lately placed in the west front at Lichfield.

It is hoped that the oak panelling will be returned several feet along the north and south walls, and be combined with sedilia.

#### BORDERS.

The plate shown is composed of three borders in leading styles, viz., Egyptian, Assyrian, and Grecian, the motif of the designs being supplied by the painted and carved ornaments upon the mummy cases, sculpture, and pottery, to be seen at the British Museum.

They are designed to repeat in as small a compass as possible, so that they may be the better suited and capable of management when used for rounded surfaces.

The bottom border (Egyptian) lends itself readily to the requirements of woven stuffs and fabrics; the second (Assyrian) more to that of carved wood, stone, or marble; while the top (Greek) seems most suited for flat-colour decoration or stencil work. They might well be used for a variety of purposes, as borders for carpets, rugs, curtains, and other fabrics, for wall decorations in stencil or printed work, for carved mouldings, edgings, and so forth.

G. C. H.

**Truro Cathedral.**—Considerable progress is being made in these works. Recently 150 tons of scaffolding were brought down by sea, by Mr. Shillitoe, the contractor. He has also just had a derrick erected,—somewhat a novelty in the south of England. Mr. Shillitoe, jun., is permanently settled on the job, and represents his father. Mr. James Babb, the clerk of the works, is now recovered from his indisposition. The Bishop's youngest son, our informant adds, occasionally has a turn at the mason's banker, much to the delight of his spiritual and temporal father.

#### PROPOSED NEW PUBLIC OFFICES, CHARING-CROSS.

THE Government appear to be at length in earnest with regard to the much-needed consolidation of the public offices, and have introduced a Bill into Parliament for the acquisition of the land necessary for the erection of the new buildings. The site selected for the purpose is bounded on the east by Whitehall and Charing-cross; on the west, by St. James's Park and the passage leading into the park adjoining the offices of the Metropolitan Board of Works; on the north and north-east, by Spring-gardens and the new banking-house recently erected by Messrs. Drummonds, and the banking-house of Messrs. Cox, Biddulph, & Co.; and on the south, by the Horse Guards and the Horse Guards' parade. It is also proposed to take the houses Nos. 53 and 54, Charing-cross, apparently for the purpose of affording a better entrance into Spring-gardens, and the house, No. 24, Spring-gardens, adjoining. The greater part of Spring-gardens, together with the passage therefrom into St. James's Park, and the small enclosed plantation upon each side of this passage, will also be absorbed, and is apparently intended to be built upon.

It will thus be seen that the site includes the Paymaster-General's office, the residence of the First Lord of the Admiralty adjoining to the north, the whole of the Admiralty buildings and the garden in the rear, the gunner's house and gun-shed, the whole of Spring-gardens, Spring-gardens-mews, and the streets formerly known as New-street, Spring-gardens, and Spring-gardens-terrace; St. Matthew's Chapel, together with the whole of the houses on the south side of Spring-gardens between the chapel and the passage leading into St. James's Park, five houses in Charing-cross (Nos. 37 to 41) north of Buckingham-court, and the houses on the east side of Spring-gardens backing upon the houses facing Charing-cross, as far as Drummond's Bank.

The houses fronting upon Charing-cross from the passage-way leading into St. James's Park to the street leading into Spring-gardens, with the exception of Nos. 53 and 54, Charing-cross, are not proposed to be taken. Messrs. Drummond's new bank, the Ship public-house, and Messrs. Cox's banking-house are not included within the limits of the land to be acquired.

The site will comprise very nearly the whole site of the famous resort formerly known as Spring Gardens, the site of Wallingford House, from the roof of which Bishop Usher witnessed the execution of Charles I.; the large house with garden in the rear, now numbered No. 18, Spring-gardens, and recently in the occupation of the Guest family, used as a temporary building by Messrs. Cox & Son during the rebuilding of their bank; and the house formerly the residence of the Speaker, Mr. Shaw-Lefevre, at the western end of what was formerly New-street. All these will be swept away, and the site will apparently be entirely covered with buildings.

It would seem as if the Government have abandoned the intention they lately entertained of placing the new offices to the southward of the present Foreign Office and the India Office. In the session of 1877 a Bill was introduced into Parliament for acquiring the whole of the land lying between the new Foreign Office and the India Office and Great George-street, extending to Parliament-street on the one side and to St. James's Park on the other. The Bill was not proceeded with during that session for some reason or other, but was reintroduced in the session of 1879, and again dropped.

The Great George-street site seems to have many advantages over the site now proposed in Spring-gardens, and it is difficult to assign any good grounds for the abandonment of the former site and the selection of the Spring-gardens site in preference, unless it be from economical reasons, which should not be paramount in determining such an important matter as the housing and concentration of several Government departments.

First, as regards convenience, the Great George-street site appears to be preferable, from its nearness to the Houses of Parliament and the official neighbourhood of Westminster. The Spring-gardens site is a little nearer the centre of London, but trenches upon a business locality, and the proposed Government buildings will be mixed up with buildings devoted to trade and commerce in a manner which seems to be highly undesirable.



It will be impossible to produce anything like an architectural effect in the buildings to be erected upon the Spring-gardens site. It may be assumed that the Admiralty and the Paymaster-General's Office will be pulled down, and on the site of these buildings, together with the site of the houses to the northward, which it is proposed to acquire, it will be possible to erect a building of sufficient importance, as regards size, to form a striking feature in the composition; but the elevation of this part of the design will require to be carried to a considerable height to avoid being overpowered by the commanding elevation of Messrs. Cox's bank, and will, in its turn, completely crush the appearance of the Horse Guards. The difficulty with regard to this latter building was felt by Sir C. Barry, who, in a design he made for the concentration of the whole of the Government Offices, proposed to raise the Horse Guards by the addition of an attic, with a large central dome, and to make that building the key-note of a magnificent composition, extending from Great George-street to Charing-cross.

Sir Charles Barry made a design for the grouping together the whole of the Government offices on the west side of Whitehall and Parliament-street, which is distinguished, as are all his works, by breadth, simplicity, and mastery of the subject. The key-note of the design is the Horse Guards, which was proposed to be retained and raised in height. On either side of the Horse Guards it was proposed to place a block of buildings slightly recessed, uniting the central block with the Admiralty on the north (which it was also proposed to retain with a new front addition towards the street), with the present Treasury buildings on the south. The whole of the buildings to the south of the Treasury, as far as Great George-street, were proposed to be removed, and a magnificent Government palace erected upon the site, with frontages towards Whitehall, Great George-street, St. James's Park, and the Horse Guards parade. The parade was proposed to be enlarged and a block of buildings erected on the north side, in the rear of the Admiralty, to balance the flank of the Government palace on the opposite side of the parade.

This was a really magnificent but a strictly conservative scheme, all the buildings which are really worth preserving being retained, and it is a matter for regret that some similar comprehensive plan for the distribution of the various offices cannot be agreed upon. The erection of the New India Office and Foreign Office has rendered the carrying out of this design impracticable, the scale of the new buildings making it impossible to utilise the old Treasury block as part of the elevation towards Whitehall, as Barry proposed.

A new roadway was also proposed by Barry from Charing-cross to the Mall, by which a direct communication would have been obtained from the Strand to Buckingham-gate in place of the present circuitous route. If the present proposal of the Government is carried, the formation of this road will be impossible in the future.

In 1854 Mr. John Tarring submitted a design to Sir Wm. Molesworth, the then Chief Commissioner, for an extensive pile of buildings for Government offices. In this scheme it was proposed to remove the buildings between the Horse Guards and Great George-street, Westminster, as far as Charles-street, as well as the block between King-street and Parliament-street. Dover House and the buildings occupied by the Board of Trade and the Privy Council were also suggested to be pulled down to form a new entrance into St. James's Park.

The block of the Treasury buildings, re-faced by Sir Charles Barry, was proposed to be retained and to form the key-note of the whole design. This block would form one wing of the proposed new buildings, and a similar wing would extend from about Fludger-street to Charles-street, the intermediate space being filled in with a centre of considerable height. The whole frontage was proposed to be about 700 ft., and the buildings would be carried back for a depth of 400 ft., and the cost was estimated at 700,000,\* and to meet the financial difficulties started, the persons proposing this scheme offered to carry it out, and present the buildings to the Government on receiving a sum of 32,000l. per annum for fifty years.

\* The cost of this scheme must have been understated. Lieutenant-Colonel Clarke estimated the cost of his design at 4,000,000l.

This design was illustrated in the *Builder* for 1854, vol. xii., p. 641, and is distinctly better than the arrangement now in contemplation. It had the merit of simplicity, and greatly resembled Barry's plan without being a plagiarism of it.

It is difficult to see why the whole of the houses fronting towards Charing-cross, as far as Dent's, was not included in the site, unless, as we have before mentioned, upon the ground of the expense. If this had been done, a continuous frontage might have been obtained, extending from the Horse Guards to the passage leading into St. James's Park, and upon this a building might have been erected of sufficient importance to compete with the huge overwhelming mass of the Grand Hotel. Upon the site as scheduled this will be impossible.

The difficulties as regards light and air are not to be overlooked. The Government having obtained a Bill for the acquisition of the site, will probably be safe from mandatory injunctions as regards their buildings, but they will not, we opine, be exempt from actions for damages, and it is possible that the light of some of the houses in Carlton-terrace and the offices of the Metropolitan Board of Works may be prejudicially affected in case buildings are erected of any great height at the north-west corner of the site.

There are some peculiarities in the outline of the site which give colour to an apprehension that the Government do not intend to employ an architect for the erection of the buildings, but that the works will be designed and carried out by the Office of Works. Lieutenant-Colonel Clarke, R.E., the Director of the Works in the Admiralty, prepared a design in 1869, which was submitted to Parliament for the arrangement of the whole of the public offices, in which he proposed to accommodate the Departments of War and Marine, the Commander-in-Chief, First Naval Lord, with three secretaries, on the Spring-gardens site. This design was illustrated in the *Builder*, vol. xvii., p. 201, and an examination of this plan will show a remarkable identity between that design at the south-west angle and the site now scheduled.

The probability is that the Government intend to build a kind of barrack without any architectural impress, and they will shelter themselves from accusations of the impropriety of this course by dwelling upon the economy that will be effected by this method of dealing with the question, and the impossibility of composing a properly-designed front towards Charing-cross upon the limited site at their command. It is difficult to avoid the conclusion that the whole matter has been pre-arranged; as, if it had been otherwise, and the Government had intended to construct a building worthy of the nation, why was not advantage taken of the rebuilding of Messrs. Cox's bank and, more recently, of Messrs. Drummond's, to acquire the sites of these buildings?

It is to be hoped that some explanation will be required by Parliament of the intentions of the Government with regard to this important step in our national history before the money for the purpose is voted; for, after the money is obtained, remonstrance will be unavailing. A distinct pledge should be obtained that the buildings shall be of an architectural character; that they shall be designed by, and superintended by, an architect; and that the strip of open ground in front of Spring-gardens-terrace, which virtually forms a part of the park, and would serve a most useful and improving accessory to the buildings as seen from the park, should be preserved as an open space, and should not be absorbed into the building site.

**Gates and Bars on Private Property.**—There seems some hope that the days of these nuisances are numbered. At last week's meeting of the Metropolitan Board of Works, a letter was received from the Home Secretary, requesting, in pursuance of an order of the House of Commons, that a return may be prepared and transmitted to him of all gates, bars, rails, and posts situated on private property in the metropolis, which obstruct the free passage of vehicles in the streets, and a copy of correspondence, if any, which may have taken place between the Vestries and this Board, or between any of the Vestries and the owners of, or persons interested in, such gates, &c., with a view to their removal. It was resolved that the return asked for should be prepared and presented to the Board.

## GODS AND GIANTS IN GREEK ART.

THE fourth lecture of the series given in support of the Society for the Protection of Ancient Buildings was delivered on the 16th inst., at the Vestry-hall, Kensington, by Professor Sidney Colvin, M.A., who took for his subject "The War of the Gods and Giants: a Chapter in the History of Greek Art."

Professor Colvin said that his object in coming there that day was to try and interest the audience in a great work of restoration which had recently taken place. Restoration was a word which had an ominous sound in some of their ears; but there was restoration and restoration. There were some people who were fond of constituting themselves guardians of existing monuments, and they were never satisfied until they had taken away in them what was venerable only, leaving what was vulgar; but there was another class of people who took an interest in monuments which had been overthrown, and which were of past civilisations. They went with spades, and probed among the mounds and sandhills of ancient glory for traces of those monuments which might still lie below the surface. (Some day, perhaps, the spade touched marble, which would be taken out of the ground more or less in a fragmentary condition, the soil being found filled with the work of men of past generations. These specimens were brought away, and served to enrich museums and other storehouses of the civilised world. That was what he called real restoration, and if that what could only get people to be determined upon this admirable undertaking of recovering lost and buried monuments of the past, the world would be gainers. There were many interesting works of restoration of that kind which had been done of late years, and it showed its great importance, as the result had been so valuable, rich, and startling. Especially had this been the case at the excavations lately carried on at Pergamos, which still retained its ancient name. It was now a small town, peopled half by Greeks and half by Turks, but it was once a flourishing town in Asia Minor, on the navigable river Calvus. Here was the famous Acropolis. At a critical epoch in the history of the world, there rose up in this city a new civilisation and a new dynasty, rising into great prosperity and importance under Attalus I. Attalus won his fame as a warrior by a mighty overthrow of his enemies. He afterwards joined policy to valour, and kept friends with the Romans, and his kingdom became the richest possibly that down to that time had been inhabited by any of the Greek race. He ruled over a mixed population, half Greeks and half Asiatics, and his wealth was proverbial all over the world. Not only were his subjects wealthy, but they were men with considerable education; they surrounded themselves with libraries, pictures, and sculpture, especially the latter, which was the most original and richest school which then existed. High above the city stood the great Acropolis which was dedicated to the worship of Zeus and Athene. This great plateau was formerly covered with buildings of the richest and most gorgeous description. The great altar then smoked incessantly. The days of the glory of the city were between 260 B.C. and 240 B.C. The whole of the kingdom did not endure for more than 150 years, after which it was bequeathed to the growing, all-devouring empire of Rome. All the glories of Pergamos and its Acropolis were obliterated until the other day. About four years ago a German engineer was struck by the appearance of the place, and began excavating. He soon received help from the German Government, who were always ready to help in this kind of work, and in the course of the excavations a store of antiquities was recovered, the most interesting being the carved slabs of an interesting frieze that used to run all around the wall below the colonnade. The figures were carved in rich relief, and a great quantity of the frieze had been sent to Berlin. The restoration of the parts would occupy skilled hands for a considerable time.

The subject of this great frieze was "The War of the Gods and Giants" and the character of it was extremely singular in Greek art, the whole design being full of various inventions. Some of the giants represented were winged, while others, instead of having human terminations, were represented with snake folds; they were placed all along the frieze, and were shown to be in deadly encounter with their opponents, the Hellenic gods and others. There was no work of art so full of turmoil or so replete with



an amount of violent ferocious invention in itself. Immense accuracy and knowledge were shown in the treatment of the muscles of the combatants. The drapery flowed in lumpy lines, while the hair was represented in rich and loose curves, the whole feeling and conduct of the work being different from the Greek art. Then, in the character of the heads, some were contracted as in despair, while others,—a youthful beauty,—showed expressions of defiance, recalling the account of Milton's fallen angels. One immediate result they got from a study of this frieze was that the famous Laocöon group had been inspired by the school of Pergamos; another result was that after a comparison with the frieze and other works, they would have to re-name a number of statues and busts which were scattered about in various museums, because they now had the materials of tracing affinities between these great friers and sculptures which had been called different names. As to the "Battle of the Gods and Giants," they knew that almost all nations had legends of giants and huge primeval men, of whom fabulous stories had been told. In the background of the imagination of nearly all civilised people remained the ideas of the primeval race of huge men and giants. In fairy tales they had been told about giants, but the Greek thoughts about them were far more of a serious kind. In the imagination of the Greeks there had been a great and portentous conflict between the gods of their religion,—the Olympian gods,—and those primeval races of gigantic men. The story ran that the earth mother, Ga, having taken a spite against the Olympian gods, urged her giant sons to overthrow them. It was a terrible warfare, and it had a treble meaning. In the first place, it had a physical meaning, viz., that the explosive nature of the earth, the impressive force of the earth's violence, was opposed to the peace and majesty of Heaven. Then came the moral meaning. It was a warfare of anarchy, darkness, lawlessness, and violence against order, law, purity, and life. Next came the political meaning, which showed the warfare of Greece against barbarism, it being symbolic of the gods fighting against the invading hordes. The original physical meaning had probably been lost by the Greek mind very much, but the other two meanings were ever present to them. Whenever the Greeks carved or painted a subject they had always present to their minds the ever momentous feeling of good over evil. That being so, it was natural that they should paint this great battle subject on their monuments, so the battle of the gods and giants was found to be a favourite one. The lecturer then proceeded to refer to a number of places where this subject was treated, and exhibited some drawings illustrative of his remarks. He contrasted the styles of the earlier Greek with those of a later date. The former, he said, showed the "severe" time of Greek art, and were quite different from the treatment of the works of a later date. Outside the shield carved by the goddess Athena was a representation of the battle of the gods and giants, which was the work of Phidias.

In the minor form of the art they had a number of examples to be found in the painted vases, some of the museums containing excellent specimens from the earliest and rudest times down to others of a later date. Illustrations were shown of the earlier examples, some of which dated from 500 B.C., the treatment of which, he said, was very rigid, while later ones showed careful and scrupulous finish. In the early art, both in sculpture and vase painting, giants were uniformly represented; but in later works Greek warriors were no longer shown as fighting with spears and shields, they in the main being naked men of wild aspect.

In conclusion, the lecturer hoped that those present would carry away with them some idea of the examples which he had set before them, and that they would feel the immense importance of the work of the restorer in bringing to light specimens not of the purest of Greek art, but the best of original Greek art in its decline. He hoped they would feel the merits of such a subject, and take an interest in a "Chapter in the History of Greek Art."

**Artists' Benevolent Fund.**—The anniversary dinner of this important fund will be held at the Freemasons' Tavern, on this Saturday, the 25th of March, when the Right Hon. W. H. Smith, M.P., will preside.

## "THE DESCENDANTS OF THE RENAISSANCE."

ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on the 17th inst., Mr. Aston Webb, president, in the chair, Messrs. H. Gilbert, H. W. Rising, W. Davis, and A. Robertson, were elected members.

Mr. Hugh Stannus then proceeded to give a lecture, illustrated by numerous engravings and photographs, on "The Descendants of the Renaissance." He explained that the short notice at which he had undertaken the duty, and pressure of other business, had prevented his preparing any manuscript, and he would ask their indulgence for what he would term a "Gossip to the younger members." He observed that in what he had to say he did not want to provoke any discussion about the battle of the styles. According to Mr. Ruskin's beautiful poetic simile, the later styles of architecture were, so to speak, the daughters of the former; but if, as he should show, the daughters of the Renaissance became afflicted with a very serious and ineradicable disease, it was through no fault of the mother. The Renaissance in its purest form flourished only during the comparatively brief interval between the years 1480 and 1510 or 1520. During that period he thought that the Renaissance was just as lovely and perfect in its way as was the finest Early English or the purest Greek. Unfortunately, it early became corrupted. In other words, it became afflicted with a disease which he could only liken to scrofula, but whereas that terrible disease did, he believed, sometimes die out from among human families afflicted by it, the scrofulous disease which afflicted the Renaissance never died out. From very small beginnings it spread itself all over the face of the world affected by it, and the fine work of the Quattro-cento period degenerated from bad to worse until the culmination of badness was reached in the time of Louis Quinze. It might be asked, Where did the evil begin? And he would endeavour to show this by tracing it to its source. One example which showed the beginning of the disease was a ceiling designed by Primaticcio, one of the Italian artists imported into France by Francis I. In that design one of the small mouldings was treated in what could only be called a plastic manner, being broken and turned up into volutes at the ends and in the centre of each side of the panel. That was, in the opinion of some people, a very pretty thing to do; but it was not the proper treatment for mouldings. It was a thing certainly calculated to catch the eye of the observer; but, as Ruskin said, when a thing caught one's eye there was something wrong about it. These curls on the borders of panels were certainly an unconstructive feature, and they soon increased in fretfulness and in power to distract the eye, becoming at the same time increasingly unconstructive. In the Venetian Cinque-cento work the volutes and curls became rampant. In the Great Hall of the Council in the Ducal Palace at Venice, the whole of the ceiling was one sprawling, wriggling mass of abominably contrived and shaped picture-frames, richly-gilt and surrounding a great deal of good art. The ceiling showed very high technical skill on the part of the workmen in the shape of wonderful carving and magnificent gilding, but it was good work thrown away on a bad design. In it the frame-maker seemed to have run riot, and the whole might have been done in compe with equal effect. It was not constructive. The Church of the Miracoli at Brescia had been utterly spoiled by having its ceiling covered with some abominable rococo "ornament," done by some person in the seventeenth century. Although he was a member of the "Anti-Sorape,"\* he thought good excuse might be urged by any one who, having that church to restore, should wipe out the whole of that rococo work, which so spoiled the church as to enable the observer to realise what the late Mr. Street, with his large experience, must have felt when he said that he longed to restore aright many churches which had been thus maltreated. It would perhaps be said to him (Mr. Stannus) by his brother "Anti-Sorapes" that if one were to wipe out the work of which he was speaking it would be wiping out history. Well, there were some kinds of history which might be better wiped out. In France, as in Italy, the disease of which he had been speaking affected other materials as well

as stone, and other arts besides architecture. Continuing his remarks, which were entirely *visu voce* and without notes, Mr. Stannus pointed out the characteristic detail of each phase of French Renaissance from François Premier to Louis Quinze, and of contemporary German, Italian, and Spanish work; and he remarked upon the great amount of attention paid by the French at the present day to correctness of detail in modern works designed in any of these seven phases; and he said that, just as Mr. Eastlake speaks of a critic who would damn a moulding if it were "half an hour too late," so the Frenchman would condemn anything if it were not in exact accordance with the style which obtained when its original was executed. In the last French Exhibition the French works exhibited a mere *réchauffé* of old French styles, while, on the other hand, it was encouraging to see how thoroughly national and alive was the art displayed by the English exhibits. That the French styles were known by the names of the monarchs who lived when they were practised was one of the inherent weaknesses of those styles. The architects and ornamentists of those days were mainly supported and patronised by the king and the nobility, but that support and patronage were given by king and nobles not from any love of art for art's sake, not because they loved beautiful things, but because they wished to add to their own aggrandisement and magnificence. The architect and ornamentist of those days was simply a superior kind of court servant. The French were fond of speaking of their kings, and the Italians of their popes, as the great patrons of art, but the kings and popes were not thinking of art at all; they were merely thinking of adding to the splendour of their churches and palaces. Undoubtedly the lowest sink of corruption which the Renaissance reached was the style known in France as that of Louis Quinze. Students of history were familiar with the fact that the court of Louis XV. was foul and corrupt in the extreme, and the style of the ornament which prevailed was in accord with both the licentiousness and lasciviousness of the time. It was rampant and utterly devoid of repose, consisting mainly of curls and scrolls. Straight lines were conspicuous by their absence. In conclusion, Mr. Stannus said he thought there existed a good chance for the pure Italian style which many of our best architects were now desirous of seeing employed in England. The patronage of architects was more in the hands of the great middle class, who needed large and important buildings for commercial and other purposes. This class largely consisted of clearheaded men, with, in the main, sensible ideas as to building, and they would not build merely for their aggrandisement or gratification. It was to the middle class that he thought architects must look for the future patronage of architecture, and, by due guidance on the part of architects, the buildings which were erected to meet modern necessities might be made pure in style and reasonable in all respects.

We have only given the heads and the salient remarks in an address which was illustrated by constant reference to the engravings (some from our own pages) exhibited, and to many sketches on the blackboard, and which was listened to with great attention.

We postpone our report of the discussion.

## THE ELEMENTS OF ETCHING.

This was the subject of an interesting lecture delivered on the 13th inst. by Mr. F. Seymour Haden in the theatre of the London Institution, Finsbury-circus. The lecturer observed that three years ago he delivered at the Royal Institution of Great Britain three lectures upon etching.\* Those lectures, like the present one, were unwritten, but they were so far thought out as to cover the whole of the ground legitimately appertaining to the subject. Those lectures were purely of a technical character, and addressed for the most part to engravers and experts, as well as to all who had engaged themselves in the practice of etching, or who took an interest in the subject. The present lecture, however, would only deal with the elements of etching, and would be, he hoped, acceptable to those who had not as yet given much attention to the subject. He proposed to divide the lecture under three or four heads. He would, in the first instance, speak of the

\* For the information of some of our readers, we may say that this is a friendly, if not comprehensive, nickname for the Society for the Protection of Ancient Buildings.

\* See *Builder*, vol. xxvii., p. 431.



principles of etching, more particularly upon the capital principle of etching, and would show the difference between etching and engraving. In the second place, he would describe the mode of practising the art of etching. Thirdly, he proposed to say a few words upon the printing of etchings, more particularly with regard to two practices in connexion therewith known as *retroussage* and *acierage*. In conclusion, he would speak of the value of a collection of etchings, and would say something as to the disabilities under which etchers laboured at the present time.

Before speaking as to the principles which should govern the art of the etcher, he would first of all give his definition of what he meant by an "art." The French say "*arts et métiers*," the English saying "arts and manufactures," neither nation, however, using the terms very exactly. "*Métier*" meant the mastery of some craft or trade; "manufacture" clearly meant, or should mean, something made by hand; but it was the rule, in speaking of "manufactures," to mean goods made by machinery. In that way the term was misapplied. He wanted to define the difference between an art and a *métier*, and between an art and a manufacture. An art differed from a *métier* in that, though it depended upon certain material agencies for its final expression, yet those agencies, like the brush of the painter, were of the simplest kind, and were wholly directed to their end by the impulse originating in the brain of the artist. On the other hand, to invest any of those simple agencies—the brush of the painter, the needle of the etcher, the pencil of the designer, the knife of the surgeon, the chisel of the sculptor, the pen of the author,—with any of the attributes of a machine, or, in other words, to render them in any degree automatic, was to make brain-power or impulse unnecessary, or to put it into abeyance, with the result of producing, not an art, but a manufacture. Now, there were many general principles relating to art. Some of those principles were common to all branches of art, but there was one capital principle which was pre-eminently essential to etching, viz., personality, originality, ideality. That was, in fact, the initiative faculty required by the etcher, who must, if he would succeed, be imbued with poetry, imagination, sensibility, and all the qualities that went to constitute the genius of the artist. Now the work of the engraver did not call for the possession or the exercise of any of those qualities; for if he was not a mere copyist, he was at any rate only a translator of other people's ideas. Very ingenious, very respectable, no doubt, was the *métier* of the engraver, but it was, after all, only a *métier*. The engraver not only copied what he had before him, but he had to work in accordance with a whole gamut of formulæ (dictated by practical conditions) concerning the production and distribution of curves and lines. It was the use of these formulæ which made all engravings more or less alike; and it was the absence of such formulæ, and, indeed, of any formulæ, which accounted for the fact that no two etchings were alike. All methods of engraving on metal, whether by the burin or by the etching-needle, whether mezzotint or aquatint, were included in the term "painter-etching." The artist was not to be confined to the etching-needle, but if he used the burin he must use it as a means of original art expression, just in the same way as the etching-needle had (of necessity) to be used. Albert Dürer, as we know, preferred the burin, and used it with wonderful effect, but all his engravings were made by him from drawings previously made by him, every line of the drawings being reproduced. Therefore, Dürer, in engraving from his own drawings, used the burin as a means of original art expression. Rembrandt, on the other hand, preferred to use the etching-needle.

Proceeding to speak of the practice of etching, the lecturer said that etching, in the common sense of the word, was engraving by corrosion. The word was, he understood, derived from a Scandinavian word signifying "to eat," and corroborative of that etymology was the fact that the etcher spoke of "biting" his plate. In the common process, the plate of copper or zinc was first coated with a protective varnish. The picture was then drawn with the etching-needle, which removed the varnish down to the surface of the metal. The plate was then immersed, and allowed to remain for an amount of time dependent on circumstances, in a bath consisting of a solution of nitric acid or chlorate of potash. The parts of the plate unprotected by

the varnish, or, in other words, the parts which the etching-needle had traversed, were rapidly acted upon by the acid. There were, as a matter of fact, two processes of etching, the first known as the "interrupted" process, and the other known as the "continuous" process. The interrupted process was that in which the gradations of shade in the plane of the picture were obtained by alternate "bitings" and "stoppings." When it was thought that certain lines in the picture had been sufficiently bitten in, the plate was taken out of the bath, and those lines stopped with the wax. By the continuous process, which the lecturer himself practised, the same results were obtained without the removal of the plate from the bath. In this process,—for which the lecturer said he had the credit, although he did not believe he originated it, but was firmly convinced that Rembrandt employed it,—the plate was put into a shallow bath, and the etching-needle was used on the surface of the plate while the latter was covered with the fluid. Under these circumstances the first scratch made by the needle would be the strongest in the picture, and the last one the faintest, and these were considerations which the etcher, using the continuous or "synchronous" process, as it had been called, had to bear in mind. Writers on the subject of etching had described that process as very difficult, but he had not found it so. If the etcher knew what he was about, the continuous process was really the easier of the two. The lecturer then proceeded to point out the difference between the engraved line, as made with the burin, and the etched line. The engraved line was in section like the letter V, and consequently, as the surface of the plate was worn down by printing from it, the groove became shallower, consequently retained less ink, and, consequent on that again, the more worn the plate became the greyer were the prints obtained from it. Notwithstanding this disadvantage, however, the engraved plate had the advantage of great durability, for a very large number of impressions could be obtained from it. On the other hand, an engraved plate could not be, in an artistic sense, what an etched plate was, and for this reason: an etching was the work of the artist himself, and the process not being a laborious or mechanical one (as the etching-needle was used with the same freedom as a pen or pencil), the artist had full play for his fancy, and hence an etching must show the individuality of the artist. Thus it was that no two etchings were or could be alike. The use of the burin, on the contrary, was necessarily laborious and mechanical, rendering it impossible for the user to "invent" as he proceeded with his work. It was true that, as he had said, Albert Dürer had made good use of the burin, but even he had found it necessary, owing to the technical limitations of engraving, to make careful drawings beforehand of what he intended to engrave, and those drawings were copied by him, line for line, in his engravings. While, however, an etching was far superior to an engraving from an artistic point of view, compared with an engraving it possessed a very low degree of durability. The acid or mordant, entering the lines scratched by the needle on the surface of the plate, undermined, so to speak, the substance of the copper, so that in section each line in an etched plate resembled, roughly speaking, the letter O with an opening at the top (the line traversed by the needle), thus O. It would thus readily be understood that each of the channels thus eaten away by the acid had a sort of overhanging roof in two halves, unconnected in the centre, and of course the roof thus formed got more or less broken-in after a very few impressions had been taken, and the plate thus lost its sharpness, and the proofs their clearness. Having described the process of *acierage*, or steeling over the surface of an etched plate from which it was desired to take a large number of impressions (the effect of which, however, was to give the prints a dry and hard appearance), the lecturer referred to what he called the vicious practice of *retroussage*, which consisted in dexterous manipulation on the part of the printer (by direction, of course, of publishers and others) so as to hide the defects of an imperfectly-etched plate. Where a plate was found to print too light or too dark in parts, it was possible, by means of retouching or re-etching, to so distribute the ink as to make a passable print from an artistically defective plate; but this, although it called for the exercise of much cleverness on the part of the printer, was not a commendable practice. In

conclusion, the lecturer referred to the disabilities under which painter-etchers laboured at the present time. These consisted of the frauds practised by some unprincipled print-sellers, to the detriment of the public and to the loss of the artists, and in the inexplicable refusal of the Royal Academy to hang on its walls a single original etching, although it had no hesitation in admitting engravings copied from pictures, and some of which engravings had been published for months past, and exhibited in the shop-windows. As President of the Society of Painter-Etchers, he felt bound to publicly protest against the continuance of this state of things.

#### UNDRAINED LONDON: A FOG-FACTORY.

SIR,—The season of sulphurous fogs having virtually ended, it is not improbable that the lessons of this winter may be forgotten, and that next November may find scientific authority nearly as unprepared to give the true reasons for our recurring local pest as our local administrations are to provide a remedy for it. A common belief seems to prevail that the London fog is a sort of cloud, blown into the metropolis from distant marshes or a melancholy ocean. Some people think that the Thames is largely responsible for it; others attribute it solely to the use of coal and the non-consumption of smoke. But no one ventures to suggest the possibility of fog being generated at our very feet, on the many square miles of open spaces to be found within the London postal district. In this province of houses there is hardly one that does not possess, in front or behind, and sometimes on both sides, its portion of undrained land; and in support of a somewhat bold assertion I beg leave to offer for your consideration a few facts.

The London house was imported from France after the Great Fire, and it was but slightly modified by Dutch and German influences. In its highest type it was the *hôtel entre cour et jardin* of the seventeenth and eighteenth centuries. Burlington House, before it was converted to its present uses, was a conspicuous example of the Parisian arrangement of plan. It had a paved courtyard in front, with offices on each side; behind the house was a garden, laid out in level plots of damp grass and beds of black mould. Other similar houses, still erect in Piccadilly and elsewhere, retain the same characteristics; in a few, the forecourt was simply gravelled, and shrubs and trees were planted around. In smaller houses, built in squares or terraces, the forecourt was a mere open space, still to be seen in Lincoln's Inn-fields; as time wore on, it degenerated to a sunk area, but in all cases the garden was preserved at the back. The houses in Portland-place, and in the streets out of it leading westwards, in the many streets parallel with it, possess, with few exceptions, a back garden or yard. The Euston and Marylebone roads are, or were, bordered with houses, each with its patch of open space belonging to it in front and its patch of open space behind. In the great highways leading to the suburbs, every house is, or was, arranged on this plan, and a glance at the Ordnance maps will show that the systematic division of forecourt or sunk area, house, and garden, is universal in the metropolis, a small portion of the very heart of town alone excepted. Hardly one of these moist yards or so-called gardens is surface-drained, and half a wet day suffices to prove. The rain falling upon them, the pools of water collected upon them are daily absorbed, and as daily returned in vaporous exhalations.

No city in Europe is even now more distinguished than London for its many planted squares, and some of these have recently been improved by a little care judiciously expended upon them. But their level plots of damp grass have not been drained, and their sparsely-planted beds of black mould are neither more nor less than sponges for holding moisture. The London mews is another indigenous institution, which may also be studied with advantage in the neighbourhood of Portland-place. These often intricate avenues of stables and coach-houses are not absolutely undrained; above and below the rough paving-stones are rude channels, whereby liquid and solid refuse is carried to the sewer. But only a portion of the sewage running, and the rain falling, upon those stones, reaches the sewer; the remainder sinks into the wet earth beneath, while a comparatively minute portion filters into the cellars and kitchens of adjoining residences. The disused graveyards are also a prolific cause of fog;



They are to be found in all parts of the metropolis and in the City, but it will suffice for my purpose to mention one in the vicinity of High-street, Marylebone, where the rich earth of human remains, buried with orthodox eulphony as "dust to dust, ashes to ashes," exudes perpetual moisture. Finally, the metropolitan parks are immense fog-factories, of which the most industrious is the Regent's Park.

The law favours, and has long favoured, the creation of fog-factories both within the metropolis and around its entire circuit. By the 29th section of the Metropolitan Building Act, 1855, every new dwelling-house is compelled to have "in the rear or on the side thereof" a certain extent of open space "exclusively belonging thereto," and, as a rule, a much greater extent of private open space is left around new dwellings than the law requires. But neither in the original Act, nor in the Metropolitan Management and Building Acts Amendment Act, 1878, nor in the By-laws made thereunder, is there any mention of the necessity of surface-draining such open spaces. Thus, along hundreds of miles of suburban roadway, when land, hitherto used for agricultural purposes, and, naturally, and often scientifically, drained, has become "building land," a large portion distributed as gardens has been left without any surface-drainage at all.

Daily and nightly, a vapour more or less perceptible to the eye, according to the hour or the season, rises from the parks and public gardens, from the many planted squares, graveyards and mews, from the yards or gardens of almost every dwelling-house, and from a thousand other undrained surfaces. The London atmosphere is never free from moisture or mist. David Roberts painted it, and I am credibly informed that Mr. Ruskin admires it. This mist, mingling with the cold smoke, at times develops into sulphurous fog, the character and duration of which are perhaps affected by extraneous influences, though I venture to think that the first cause of fog is to be found in the vaporous exhalations of numberless undrained spaces in London itself; and as these exhalations are more or less considerable in volume, so is the after-fog more or less sulphurous and dense. Smoke-abatement crusaders are soaring heavenwards, and they have already succeeded in proving the superiority of anthracite coal and thrice-wonderful stoves, but the promoters of a no-fog movement must be content, for many a long winter yet, to bend their faces to earth: the problem before them is the old unsavoury one of sewers and drains.

I have variously alluded in this letter to the neighbourhood of the Regent's Park, for hardly any part of town offers to the statistician a more prolific field of inquiry. The park, possessing a very heavy soil, was drained, so to speak, some thirty years ago, on a system which has admirably prepared it for scientific surface-drainage. If the officers of the Meteorological Council, already engaged at St. Bartholomew's Hospital in collecting fog statistics, would extend their observations to the Regent's Park, a step would be made in the right direction. The three public bodies having charge of the Park, its houses and its gardens (some of which, I am told, have been recently drained), would hardly fail to agree in permitting such statistics to be collected. Whether, when the cause of the fogs which are native to this neighbourhood is definitely ascertained, they would be in a position to apply the proper remedy, is another matter. By an apparent freak of administrative logic, the main body of the Park is under the jurisdiction of the Office of Works and Public Buildings, the houses around are managed by the Office of Woods, Forests, and Land Revenues, and the gardens by the Crown Estate Paving Commissioners,—a division of control, however, not more anomalous than is enjoyed by other portions of the capital. WILLIAM H. WHITE.

Conduit-street.

#### BIRMINGHAM ARCHITECTURAL ASSOCIATION.

An ordinary meeting was held on Tuesday evening, the 14th inst., at the Rooms, Queen's College. Mr. Enoch Wood presided, in the absence of the chairman, Mr. McConnell, and there was a good attendance. After the business, a paper on "Statues and Monuments" was read by Mr. J. William Tonks. A discussion followed, and a hearty vote of thanks was accorded to Mr. Tonks for his very interesting paper.

#### AN ARTIST'S VIEW OF THE SMOKE QUESTION.

REPLYING for "Art" at the dinner given by the Lord Mayor, to which we alluded in our last,

Sir F. Leighton said:—I have to offer my most sincere thanks to my friend Mr. Sala for the eloquent and picturesque terms in which, *more suo*, he has brought before you the toast of "Art." I thank you, my Lord Mayor, and this distinguished audience, for the kind indulgence with which you have received this toast. I confess I am anxious to withdraw my personality altogether from your notice, and to make my few remarks have a bearing on the matters which have assembled us here to-day. In the name of those arts which have been so graciously acclaimed, I desire to join in protesting against what I shall venture to call the crushing onerous under which the inhabitants of our great city groan during the better part of the year. I am filled, however, with a keen sense of the absolute superfluity of any such expression in my mouth. Surely it is obvious enough that among the melancholy millions who grope their darkling way through our English winters none suffer so much under this smoke pest as the members of the community to which I belong, and for which I have now the honour to speak, in spite of those advantages to which the American Minister so amusingly alluded. Whilst the infection which emanates from the tainted breath of that smoke pest fastens upon us artists just as it does upon you, and whilst, in common with the rest of you, we wheeze, we cough, we gasp, we choke, and occasionally we fairly flicker out like the rest of you, we are further and especially attacked and paralysed in the heart and centre of our intellectual activity; for we live by the suggestive imitation and presentment of that which is revealed to us by light,—and by light alone,—and made lovely by its splendour. To us, therefore, the quenching of light, the blotting out of colour, is an approach to the drying up of the very life springs from which we are fed and set in motion. The list of our grievances would be long, and would be wearisome, but many a brother painter must regret with me the interminable hours, days, and weeks of enforced idleness spent in the continuous contemplation of the ubiquitous yellow fog, depressing the spirits all the more for recalling the memories of distant lands, where the sun shines in the sky, and sheds its gold over all things, where the fragrance of a thousand blossoms, not the soot of a thousand chimneys, is wafted in through open windows, and where crime does not blot out the heavenly face of nature. All these and other things tend to make this plague of smoke a more terrible thing to us artists than even to our non-artistic fellow-sufferers. Certain it is that no body of men would hail with greater joy the dawn of that day when this black will be at least assumed. We are led to believe, from what Mr. Ernest Hart has said, that perhaps this much-desired solution is not so very far distant. It is to be hoped that the urgency of the need will furnish, if it has not already furnished, an incentive to inventive ingenuity and production, and that the day is not very remote when the problem of the abatement of smoke, without any of those ventilation difficulties which have been so amusingly alluded to by the American Minister, may be effectually solved. But when this happy day arrives there will still be a far more Herculean labour for the Smoke Abatement Committee. The remedy having been found, the patient must be taught to take it. It must be brought home to every man that he is not a victim only, but a begetter and spreader of this plague of smoke, which rises not only from his neighbour's chimney, but from his own also. When he is awakened to that sense of responsibility, when every householder shall say, "My chimney shall not smoke," then the millennium will have come. From that day forward the half-remembered sun will again shine in the forgotten blue sky, and the foul flunguous days of the present will become a horrid dream and memory of a very dismal past.

Sevington.—A painted window has lately been erected in the parish church of Sevington, Kent. The window has the arms of Norwood and Price introduced, and has been executed by Mr. Charles Evans, of Warwick-street, Regent-street.

#### EXTRACTION OF SEWER-GAS FROM HOUSES.

THOUGH a great advance has been made in the last few years in the protection of houses from the dangerous gases generated in the sewers and drains, and a generally approved system has been established by our sanitary engineers, there are, in my opinion, weak points in that system not sufficiently recognised.

The arrangement usually adopted is to cut off all communication between the house and the street sewer, by the whole drainage being made to flow for some small space in a channel quite open to the air, and thence through a trap into the sewer. The house system of pipes and drains being thus secured, as far as a water-seal can do it, against any influx of gas from the sewer, there is no danger to be dealt with, but the gas generated on the premises. To reduce the danger of this to a minimum, all the rain-water and waste from cisterns, sinks, baths, and the like, are made to flow into the open air, and so through traps into the house-drain, leaving no communication between the interior of the house and the drain but the unavoidable connexion of the w.c. with the soil-pipe, which pipe is converted into a ventilator by being carried up, of its full size, well above the highest windows. By this arrangement there is a free passage for a current of air from the opening between the house and the street sewer and the head of the ventilator at the top of the house. When this is working well, an influx of air is secured at the lower opening, no gas can accumulate, and all that is generated will be greatly diluted, if not entirely chemically changed, before it reaches the w.c. valves, through which it has at times an entrance to the house. It will be seen that the success of this arrangement depends upon a constant current being established through the soil-pipe ventilator, on which depends, not only the dispersion of the gas, as above described, but the very important point of the lower opening being an inlet, and not an outlet for the gas of the drain; as its position below the windows and doors of the house make it essential that it should not act in the wrong direction. It is essential also that the current should be repaid, as on that depends the condition of the foul air when it reaches the w.c. inlets. If the flow up the soil-pipe is sluggish, the air drawn from so foul a source may be full of gas. The first question, therefore, is whether in this arrangement any rapid and constant current has been secured; and it must be admitted, I think, that the answer will not be satisfactory.

When no mechanical appliance is added, the upward current is supposed to result from the height of the ventilating shaft, aided by the wind across its open end; and when anything like an active current is found, with the air at rest, it must result from some difference of temperature in a part of the pipe, as there is nothing else to cause it, and when the wind falls the other action ceases. Neither one cause nor the other can secure the brisk and unflinching draught of air required.

Many laudable efforts have been made to produce and maintain this all-important current by means of cowls, but one and all of them depend for their success upon the wind. A faint breeze, however, never can produce a rapid current, and when the air is still no cowl can ever raise the wind.

We have not, then, in the ordinary treatment of houses the security we look for in the action of the ventilator, and to my mind there is another fault in the arrangement capable of correction. I have always advocated the advisability of using a ventilating pipe, which, having no connexion with the interior of the house, may induce a current down the soil-pipe, getting its supply from the upper air, so that, if there is any influx in the w.c. when the valve is open, it will be from the best source available and not the worst.

Though this arrangement does not correct the absence of a current of air in the ventilation, it produces the effect required when the movement is over so slow, as the foul air from the drain cannot reach the vulnerable points when there is any downward current at all. I may add that I do not stand alone in the advocacy of this system; others have used it, and all I want is to urge its adoption generally.

In a few words, the arrangement I criticise is, as I have said, a step in advance. The trap between the house and the sewer is most



important, and a free passage of air through the house system, by there being an opening at both ends of it, is as important. The gas cannot accumulate and concentrate, nor can a pressure from its expansion force it into the house as it does where no change has been made, while the connexions between the houses and the drains are few instead of many. These are very great improvements, and have shown their value in numberless cases. The arrangement I advocate is another step forward, removing the necessity for the questionable opening on the ground-level, drawing the best air obtainable past the soil-pipe connexions with the house, and making the working of the system independent of a rapid current where it can not be secured,—up the soil-pipe. In the simplest houses, these are the most important improvements; and, in such buildings as necessitate openings on a low-level,—in confined courts,—they are of infinitely more importance still.

I have found one, and only one application of this system that satisfies me, and that is, in the admirably-appointed houses building in Phil-beach-gardens, West Brompton, by Mr. Mineard, who not only draws his ventilation current down the soil-pipe, but ensures a constant draught by having a gas flame in his ventilator. In this arrangement the system is perfect, a strong indraught being found, not only at the head of the soil-pipe, but wherever a valve is opened, and the critical inlet between the house and the street sewer is unnecessary. This, of course, causes some expense; it may add 25s. to the cost of a house, and 2d. a day in gas. But there will doubtless be modifications of the system. Other sources of heat may be found, or one ventilation may serve for two houses. At its worst, as Mr. Mineard very justly says, the daily cost is only equal to that of one glass of beer.

F. C. COTTON, Major-General.

#### THE WATER SUPPLY OF DUBLIN.

INSTITUTION OF CIVIL ENGINEERS OF IRELAND.

MR. PARKE NEVILLE, M. Inst. C.E., the President of this Institution, took for the subject of his inaugural address (delivered in Dublin) the Vartny Waterworks. We extract the following passages:—

The river Vartny, from which the city of Dublin, together with the extra municipal districts, are supplied, is a comparatively small mountain river in the county Wicklow, which rises on the southern base of the great Sugar-loaf hill, and thence flowing in a nearly due south direction, passing through the Devil's Glen and the village of Ashford into the Broad Lough (where it assumes the name of the river Leitrin), and discharges into the sea at Wicklow.

The length of the river, from its rise to the sea, is 17½ miles, and the total catchment area is 34,890 acres. The geological formation of the entire drainage area is the lower Silurian and Cambrian slate, unless where near the mountain tops the granite crops out in spots. It yields a peculiarly soft, pure, clear water during a considerable part of the year, but for some months the water collects peaty matter from nearly out-out bogs through which its tributary streams pass down, and this renders the filtration of the water necessary. From the natural formation of the valley through which the Vartny passes, it was easy to find out the best site on which to place an embankment, to form a storage-reservoir for the water-supply of Dublin. Considerable difficulty arose in ascertaining the quantity of rainfall which could be relied on in the Vartny districts as no rain-gauges existed prior to some erected by the Corporation in 1860. Mr. Glaisher, of the Royal Observatory, Greenwich, was, with other scientific men, together with the consulting engineers of the Corporation (some of the most experienced gentlemen in waterworks in the world), were consulted, and finally, from observations and the best data obtainable they calculated that the average depth of rainfall in dry years would be 29·2 in., and after allowing 15 in. to be lost in evaporation and absorption, 14·3 in. would remain for the supply of Dublin during the succession of dry years. The catchment area, draining into the river above the point selected as the site for the erection of an embankment, was 11,080 acres, and 14·3 in. of rain over this area would be sufficient to give 12,000,000 gallons per day, or 25 gallons a head for an assumed population of 400,000,—2,000,000 gallons for ordinary manufacturing purposes. In estimating the above quantity as the probable

rainfall, care was taken to arrive at the minimum annual rainfall, making allowance for the probability of a succession of dry years. In the plan as lodged in Parliament, it was designed to construct a compensation reservoir at a point lower down the river (at Annagollen Bridge), at about two miles below the proposed storage-reservoir, to provide water compensation against the claims of the millers and riparian proprietors on the river below, so that if the rainfall were taken it would give them more water than they were entitled to. However, fortunately, prior to going before the Committee on the Bill, this reservoir was abandoned, and it was determined to give money compensation in lieu. By this arrangement the Corporation have become the sole owners of all the water which falls upon the catchment-basin above their works, and no party has any right or title to use or divert any of it.

The point selected on the river Vartny as the site for the embankment to form the great storage reservoir is about 7½ miles from its source; the level of the water in the river at this point was 632·74 ft. above Ordnance datum, and about 520 ft. above the highest part of the city of Dublin. The level ground where the river rises is about 1,100 ft. above Ordnance, and the boundary of the catchment basin on the west varies from 2,384 ft. at the top of the Dance Mountain to 1,581 ft., and on the east from 1,200 ft. to 800 ft. The main embankment which forms Lough Vartny is 68 ft. high at its deepest part, and the greatest depth of water is 50 ft.; it is 1,640 ft. long and 28 ft. wide on the top, over which the public road passes; the base at the deepest part is 380 ft.; the inner slope being 3 to 1, the outer slope 2½ to 1, and the total quantity of earthwork in it is 320,000 cubic yards. The reservoir, when full, covers about 405 statute acres, and the top-water level 692·45 above Ordnance datum; the bye-wash, which is on the eastern end, is 300 ft. long; the mean depth of the reservoir is 22 ft., and its capacity is about 2,400,000 gallons, or equal to 200 days' supply for the city of Dublin and suburbs, at the rate of 12,000,000 gallons per day; but this allowance was, as I will hereafter show, very much too little. The reservoir and works are surrounded by a boundary-wall of rubble stone 5 ft. high. It is about 11½ miles long, and encloses about 550 acres under lake embankment, filters, bye-wash, &c. The water is conveyed out of the lake on to the filter-beds, of which seven were constructed originally, and there were three added about three years ago. They are all the same size, 215 ft. long and 115 ft. wide at the top, and 157 ft. by 89 ft. at the bottom, and are 10 ft. deep from the level of the roads, and contain 6 ft. 6 in. in depth of filtering material. It was intended to work the filters with a head of 2 ft. of water, but this did not produce percolation sufficiently speedy to meet the demand; about 3 ft. is now maintained. The total area of land occupied by the filter-beds, tanks, water-courses, and ground, below the embankment, is over 50 acres.

It is necessary to clean the filters, according to the season of the year, by scraping off the top about half an inch of sand and a thin fibrous substance that deposits on the beds, and occasionally as it is required about 6 in. of the sand is dug off the entire of a bed and replaced with clean-washed sand, cleaned by a sand washing-machine erected at the filters, which is worked by a small turbine-wheel which derives its motive power by head of water brought down from the reservoir; also, when found necessary, all the sand, 2 ft. 6 in. in depth, is renewed with new or clean sand. The water is delivered into pure-water tanks, 250 ft. long at top and 150 ft. wide at bottom, and with a depth of 11 ft. of water checking all vegetation. The water is conveyed from the pure-water tanks by a pipe 150 yards long and 33 in. diameter, and 670 yards of 42-in. pipe to the tunnel, the fall being 45·5 ft. per mile. The tunnel which conveys the water under the range of hills dividing the Vartny Valley from the eastern side of the hills, is curved round in its course, as the water enters at the south end of the tunnel, and discharges at the north-east into a relief-tank at Callow-hill.

At the tank at Callow Hill a cast-iron gauge is fixed, of the most improved section, the same as designed by Mr. Bateman for the distributing reservoir of the Glasgow waterworks at Milngavie. By this gauge weir the quantity of water passed down from the storage reservoir daily for the supply of the city and suburban districts, and all manufacturing purposes. The water is

gauged six times daily by a fixed index. The weir is divided into two bays of 10 ft. wide each, over which the water falls into a circular basin 86 ft. diameter and 10 ft. deep. The level at the tank is 602 ft. over the Ordnance datum. From this tank the water is carried to the Stillorgan distributing reservoir by a main 2 ft. 9 in. diameter, in length 17 miles 4 furlongs 42 yards, or 30,942 yards, with a falling line or hydraulic inclination of 20 ft. per mile. Of this main 21,048 yards are laid across the country, and 9,894 yards along the county roads. There are three relieving-tanks constructed along this line of pipes to break the pressure, and at each are inlet and outlet pipes to turn on or off the water. The main is made of different thicknesses, according to the pressure. In the Glen of the Downs the main is 1½ in. thick, the pressure 300 ft. Also part of pipe-laying was difficult, especially at the crossing of the Dargle, Cockstown, and river at the county boundary, but chiefly at the first-named. The main was originally designed to pass under the river, but after the pipes had been laid alongside the river to some distance, and got under the bed of it, a great flood came down and tore up part of them, and altered the bed of the river. I then recommended that the main should be carried over the river, which was adopted, and the handsome bridge supporting the main now adds to the beauty of the Dargle Valley.

From Rathmichael tank the water flows to the Stillorgan reservoir; but from having to change the site of those reservoirs, owing to the enormous price attempted to be obtained by the owner of the land on which they were first fixed by Parliament, the land on which they now stand was purchased, and by this led to the distance of the reservoir from Rathmichael being increased and the hydraulic inclination somewhat reduced. There are two reservoirs constructed,—the level of the lower being 271 ft. above Ordnance datum; average depth, 22 ft.; contents, when full, 43,166,540 gallons: the level of the higher is 274 ft. above Ordnance datum; average depth, 20 ft.; and contents, when full, 43,057,424 gallons. The grounds within boundary walls is 26a. Or. 30p. There was considerable difficulty in getting good foundations for the puddle-gutters in the banks of those reservoirs, from meeting some very bad faults in the soft granite rock; but since all was finished, there has not been any trouble since or sign of leakage.

There is a handsome valve-house and screen-chamber built at the lower reservoir valves, through which the water is drawn for the supply of the city from one or both reservoirs, it first being passed through a copper screen, thirty strands to the inch, to catch any floating matter, &c. The screw-gearing for working of the valves is placed on the floor of the valve-chamber round the walls, with indexes on them, so as to enable them to be worked with the greatest accuracy.

In the year 1874 a separate main, 15 in. in diameter, to give a supply to Kingstown and Dalkey, was laid, provision having been made originally in the walls for this extra main. For the supply of the city two mains of 27 in. diameter are laid along the Donnybrook-road to the city boundary at Eastace Bridge; along their course small valve chambers are built at Merrion-avenue, Simmescourt, and at South side of Leeson-street Bridge. In those chambers groups of valves, by working which the water can be turned off in case of accident from one of the mains to the other, and the supply kept up by the second, while repairs are made to the first. At those points, as well as others, valves are placed and branches taken off for the supply of the Pembroke and Blackrock townships, and on the north side of Leeson-street there is a group of valves for controlling the admission of water into the city main, and here there is a safety station and telegraph, where men are kept night and day. From or to this station messages can be sent at all hours, both night and day, as to the state of the water passing over Callow Hill weir, and the minutest matter that may occur along the line of main. Men also are engaged to walk the entire line out every twelve hours, to watch for leakages, &c., on the discovery of which they are immediately communicated with the nearest telegraph station. Subsequently, under private Acts of Parliament, the following townships entered into contracts for supplies of water:—Clontarf, Kilmalmain, Killybeg, and Ballybrack, Bray, Kingstown, Dalkey. Of course some new work were required, and various alterations of small matters found necessary to complete the line and put the system, after connexions with the



townships, into effective working order. The first real want found was a greater filtering area, as at certain periods of this year a good deal of peaty matter came down, and required that filter beds should be frequently cleaned, and occasionally we had to send down in very dry weather small quantities of unfiltered water to keep up the supply to the high levels. In 1874 an Act of Parliament was obtained for obtaining additional land for the new filters, &c. Three new filters were commenced in 1876 in continuation of the four original, made on the south-east side, pure-water tanks. They were made each the same areas, and in other respects the similar to those made with the works. By the Act we got a splendid fine-sand quarry at Annamore, where we have an inexhaustible supply of perfectly clean sand always at hand. From the natural configuration of the ground north-east of the filters the embankments had to be very high, and the puddle-trench in the valley next the bye-wash sink very deep; the height from the bottom of the puddle-trench to the top of the road round the filter at the north-east corner was 40 ft. deep. The tail of the bye-wash had to be entirely altered, and the channel lengthened by 350 yards to reach the old river-bed. The conduit to convey the filtered water back to pure-water tanks was designed at first to be an iron pipe, 40 in. in diameter; subsequently I decided to construct it of Portland cement concrete, 4 ft. 6 in. by 4 ft. diameter. This was placed on the top of the northern puddle-gutter; the puddle was carried up round it, and this has proved very successful, not showing the least subsidence, and was a great saving on using an iron conduit. The entire of these works have been most successfully completed by men employed direct, under the supervision and direction of the Corporation engineers and overseers, and not the slightest sign of leak or settlement of any kind has occurred. The cost has been about 9,181*l.*, and we have now, by continuing the northern water-carrier to the river, been able to get rid of a dead end which we had on this carrier formerly, so that both the carriers can now be flushed and swept out as required. This work was finished in October, 1878.

Since the construction of those new filters, making ten in all, we have been able to filter the water slower, and deliver it always filtered in a better condition to the consumers in the city and townships.

Great complaints are made from the townships and part of the city from want of pressure on the mains. This is principally due to waste of the householders, chiefly from their not looking after their fittings and allowing the water-taps to run to waste; but there are parts of Dalkey and Killiney where the want of pressure is due to the present level in the Stillorgan reservoir and the low levels drawing away the water.

Immediately after the Vartrey was decided on by Mr. (now Sir John) Hawkshaw in his report of October, 1860, as the best source for the supply of water to Dublin, the Corporation adopted it, and in 1860 several rain-gauges were placed at different points adjoining the proposed reservoir and works.

The quantity of water that can be relied on from the catchment is 7,985,000,000 gallons, and if from this is deducted the quantity assumed to be drawn out in one year by the 33-in. main, — 5,840,000,000 gallons, — the quantity remaining from catchment that the pipe, at 16,000,000 per diem, cannot bring down is 2,145,000,000 gallons. Or, if I assume the 33-in. pipe capable of discharging 18,000,000 gallons per diem, this would convey into the city 6,570,000,000 gallons, and if this be taken from 7,985,000,000 gallons it would leave 1,415,000,000 gallons of water due to catchment beyond what 33-in. main could take. I will take, for safety, that 2,145,000,000 gallons of water remain, coming off the catchment, which the 33-in. main cannot take, and which goes to waste over the bye-wash, and to impound so as to utilise this, a second reservoir will have to be constructed. There is a good site for an additional reservoir about a mile to the north of the present Vartrey Lake, where a new one could be constructed which would hold about 1,000,000,000 gallons, and this, I think, would be large enough.

The real cost of bringing into Dublin the remainder of the water that can be got from the catchment belonging to the Corporation would be about 55,000*l.*, and for this they will secure, say, 2,000,000,000 gallons, at least in the driest of years, beyond the present supply, or about 5,479,000 per diem.

Certain experiments made by the author (and the details of which he gives) as to the discharge of water through large mains or pipes, show the necessity, in his opinion, of correcting the ordinary formulæ of Da Buat, Eytelwein, Leslie, and others, "on which engineers so much, or I may say, entirely, rely for calculating the flow of water under heavy pressure in pipes of large size; and the main object I have in bringing this very important question forward is in the hope that some of the young members of the Institute, with time to spare for a little scientific pursuit, would take the matter up and work out a formula or table on the subject, and every facility the Dublin works afford I will place at their command. In the present state of things it cannot but be regretted that, in using Beardman's tables, or the formulæ referred to there, engineers are led astray as to the real facts."

#### PUBLIC-HOUSE PROPERTY.

A REMARKABLE illustration of the value of public-house property is to be obtained by the application of a little study to the list of public-house sales for a year (viz., from November, 1880, to October, 1881, both inclusive), which is to be found in the *Licensed Victuallers' Guardian*. Ten densely-printed pages tend rather to confuse than to enlighten the hasty reader. But study of the same brings us to the conclusion that 699 public-houses, in London and the vicinity, were brought to the hammer in the year in question, out of which only 154, or 22 per cent., were sold, the remainder being bought in, withdrawn, or otherwise not sold. The value in some cases was very high. The Chippenham Tavern, Harrow-road (a 70 years' lease, at the rent of 150*l.* per annum), sold for 17,500*l.* Upwards of 10,000*l.* was given for each of the following:—The City Arms, City-road; the Falcon, Clapham Junction; the Greyhound, Fulham; the Kingsbridge Arms, Millwall; the Plough, Clapham Common (13,000*l.* for a 35 years' lease at 134*l.*); the Russell Arms, Gravesend; and the St. Helena Tavern, Rotherhithe. The Hop Pole, Hammer-smith, was bought in for 16,000*l.*; the Skinners' Arms, Great Suffolk-street, Borough, at 18,000*l.*; and the Woodbury Hotel, Stamford-hill, for 15,000*l.* In eighteen cases only is "no bid" stated. The lowest price fetched was for the Fox and Hounds, Southwark Bridge-road, which is at a rent of 60*l.* per annum, but no lease is mentioned; for this the sum of 170*l.* was paid. But few purchases, however, come below four figures; and sums of from 3,000*l.* to 5,000*l.* seem to be the prices in the majority of cases. In regarding the extraordinary impulse which has lately been given to the trade of the builder in certain districts, — as, for example, in the neighbourhood of Wandsworth Common, — we cannot but think that a study of the above-cited list may be of material service to the hesitating investor.

#### DOUBLING THE SOUTH-WESTERN RAILWAY FROM CLAPHAM JUNCTION TO WIMBLEDON.

LARGE numbers of workmen are at present employed on the London and South-Western Railway, between Clapham Junction and Wimbledon, in carrying out the works for laying down another double line of rails between the points named, in order to give increased facilities for carrying on the present congested traffic, and also to provide railway accommodation for the numerous population around Garratt-lane, which is situated about midway between Wimbledon and Clapham Junction. At present none of the company's trains stop between the Junction and Wimbledon, the consequence being that the residents in Garratt who may wish to avail themselves of railway communication have to walk a distance of about two miles, to Clapham Junction on the one hand, or to Wimbledon on the other. This inconvenience to the inhabitants of the increasing village of Garratt will shortly be removed by the completion of the works now in progress for doubling the line, and the opening of the new station which is about to be erected on the west side of the railway in Garratt-lane. From a short distance south of Clapham Junction to Wandsworth Prison, the line is in cutting, and thence runs on an embankment to within about two miles from Wimbledon, when it again proceeds through a cutting. The embankment portion is being widened on the east side, whilst in the cutting portion excavations are proceeding on both sides of the railway, so as to admit of an additional line being laid down on each side. It is expected that the works will be completed and the widened line opened for traffic in July next. Meantime, in anticipation of the opening of the station, a considerable amount of building is going forward in the neighbourhood of Garratt-lane.

#### NEW YORK AND ITS WATER SUPPLY.

ONE of the "multitudinous problems in the Government of the metropolis." This is one of the headings with which the *New York Herald* introduces an elaborate report of Commissioner Hubert Thompson on a plan for increasing the Croton supply of water for the use of that city; and some of the facts in it bear on the question of water supply and works to an extent that makes the report of great interest. The year 1881 was a year of deficient rainfall in the United States, — it was 2 in. less than in any previous year since the introduction of the well-known Croton water as a source of supply for the city of New York, whilst the frost at the beginning of the year increased the quantity of water used there as here. Mr. Thompson, in these circumstances, requested the chief engineer of the Croton Aqueduct, Mr. Isaac Newton, to consider the question of the water supply, and to report on the steps needed for its maintenance and improvement. After several other suggestions, Mr. Newton brought forward a plan for the storing and conveying the water of the Croton to the city. That plan is to construct a dam across the Croton near its mouth, and thus to embrace the entire area of its water-shed, and to add 23 square miles to the existing drainage area. There would be formed a reservoir or lake of over 3,600 acres, which would give storage for 32 million gallons, without considering the flow of the Croton. From this reservoir an aqueduct, mainly in rock tunnel, would be run to the Harlem River, and thence to the existing Central Park Reservoir. The estimated cost was at first 2,400,000*l.*; but changes in the quantity proposed to be provided for brought up that amount to 2,500,000*l.* This, then, in brief, is the great scheme that New York has before it for the extension of its water supply.

As expedients for the checking of the waste of water, the use of meters was recommended, and the report goes on to say that in New York there are now 5,293 such consumers' meters fixed in hotels, breweries, offices, &c., the quantity of water passing through which is now 11,925,400 gallons daily. But it is added that if meters were used in the same proportion to population that they are in some other American towns there would be, instead of 5,293, not less than 400,000.

A few facts are recorded showing the manner in which the existing supply of water in New York continues to be extended in its use. Over nine miles of pipes additional were laid during the past year, making 512 miles of distributing pipes, with 5,427 stop-cocks. It is proposed speedily to place new throttle-valves on the large outlet mains at the distributing-reservoir, so as to minimise the loss of time in cases of fire in the turning on of an increased pressure. The fact most dwelt upon in the report, so far as the existing supply is concerned, is the need for the increased use of water-meters or some similar instrument, so as to check the enormous waste that is known to exist, more especially in dwellings now exempt from the law enforcing the use of meters.

#### AN EXTRAORDINARY SPRING.

IN a mine near the busy centre of St. Etienne, a French mining engineer, in boring at a depth of 1,500 ft., is reported to have come upon a hot spring, whose waters rushed forth in a column to a height of nearly 80 ft. above the surface of the earth. It is similar in height and heat to the so-called Stracke geyser, and is strongly impregnated with carbonic acid. The French Academy of Sciences have determined to send a deputation to examine minutely into the peculiarities of this phenomenon.

**Wood Paving, Kensington.** — For the Kensington Vestry the Improved Wood Paving Company, Limited, are now putting down about 30,000 square yards of paving, at the cost of 14,760*l.*, in the Brompton-road and Richmond-road, running up to the "Bell and Horns."



## THE BUILDING EXHIBITION AT THE AGRICULTURAL HALL.\*

## VI.—DECORATIVE ART AND MATERIALS.

**Wall, Ceiling, and Floor Decorations.**—Some excellent paper-hangings, very good in design and colour, are shown by Messrs. W. Woolmans & Co., of High-street, near Manchester-square (Stand 58A). These papers possess the great additional merit of being entirely free from arsenic, although some good bright green colours are among those shown in the specimens. Messrs. C. Hindley & Sons, of Oxford-street (Stand 56), display some excellent embossed "Japanese leather papers," admirable in effect. With the appearance of old embossed leather, their cost is little above that of a good ordinary wall-paper. They are made, not only in the ordinary width, but 1 yard wide, and well deserve attention. The Papyrolite Company (Stand 59A) again exhibit their handsome and convenient wall decoration. It is warm and comfortable, and easily applied. Highly satisfactory results are attainable with it at a comparatively small cost. The "Lincrusta-Walton," or Sunbury wall decoration, is exhibited at Stand 29, by the manufacturers, Messrs. Frederick Walton & Co. (Limited). We have on several previous occasions noticed its merits. It is impermeable to moisture, readily washable, and applicable to an infinity of uses besides its chief use, that of providing a permanent ornamental covering for walls. It readily lends itself to any style of design, and the relief of surface obtainable by it is of great artistic value. The designs exhibited are mostly in the prevailing mode. Messrs. Ballman & Ivey, of Wigmore-street (Stand 74), have again a very excellent display of scagliola, including an architrave and "over-door," and a dado and pilaster, made for the new building of the Life Association of Scotland, Pall-mall, from the designs of Mr. Alexander Peabody, architect. The Papier Mâché Co., Wellington-street, Strand (Stand 84) show some very well modelled architectural enrichments in papier mâché and carton-pierre for ceilings and walls. Such details as capitals, consoles, &c., are also exhibited here. Messrs. George Jackson & Sons, of Rathbone-place (Stand 58), are exhibitors of some excellent ceiling and cornice enrichments in fibrous plaster. Messrs. Whitcombe & Emsen are exhibitors of Eitohine's patent plastering, which we have described on previous occasions. It has much to recommend it.

**Paints, &c.**—The Albissima Paint Company (Stand 57) exhibit their excellent white paint, which is non-poisonous and, we believe, durable in wear. It is, we hear, coming into increasing favour. The Sanitary Paint Company, Liverpool (Stand 33), exhibit specimens of work executed in their non-poisonous manufactures, including "Griffith's patent white," enamel paints, silicate washable distemper, and a petrifying liquid for damp walls. The results are satisfactory. The Silicate Zopisaa Paint Company (Stand 91) exhibit their Silicate Zopisaa composition as applied to bricks, stone, plaster, and other materials. This company's Granite Paint is a very useful preparation. Mr. H. C. Stephens, of Aldersgate-street (Stand 91A), shows his wood stains and specimens of excellent work done by their aid. Messrs. Wilson & Co., of Stowmarket (Stand 22A), exhibit their useful alkaline composition for removing and cleaning paint.

## VII.—MISCELLANEOUS.

**Locks and Ironmongery.**—Messrs. Hobbs, Hart, & Co., Cheapside, E.C. (Bay 5), have on view some very fine specimens of their fire-resisting safes, especially designed for banks, merchants, and other firms. The cabinet-safes, with imitation drawer-fronts, are highly finished. Here are also on view strong-room doors designed for brick and iron bonded walls and bullion vaults. There is a good assortment of locks, keys, and door and bell furniture to match. Among the exhibits are "Change Key-locks." The exhibits may be safely pronounced excellent in workmanship. Messrs. Pryke & Palmer, Upper Thames-street, E.C. (Stand 77), exhibit a good and varied assortment in wooden lock-furniture in addition to their other various objects. The locks include plain brass rim and mortise, with furniture and finger-plates to match, together with hand-painted, gilt and plain china lock-furniture. The firm also exhibit a fanlight opening appliance very serviceable under

particular circumstances. Mr. James Hill, Upper Thames-street, E.C. (Stand 30), has on view this year a very large display of locks, and lock, door, and sash fasteners and fittings, together with general building ironmongery ware. A speciality on view this year is "Hill's New Patent Spindle," with knob adjustment and covered rose. This is worthy of attention, and it certainly has obvious advantages over the old methods of fastening the knob to the spindle by the exposed screw,—sure to work out after being some time in use. This knob adjustment is suitable to either thin or thick doors, and is also applicable to both rim and mortise locks. Messrs. Joseph Kaye & Co., High Holborn and Leeds (Bay 6), show what are termed "Indestructible Locks" and door furniture. A piece of octagon-shaped timber framing is shown on this stand, in every square of which a door is hung, affording different examples of the locks and furniture used. The locks include mortise, rim, sash locks, catches, sash bolts, and other varieties. The Yale Lock Manufacturing Company, Stamford, Conn., U.S.A., and Strand, W.C. (Stand 94), are strong in their display of locks of every description,—automatic time locks, and door, drawer, and chest locks, &c. Mr. William P. Bonwick, Cougham-road, Shepherd's-bush (Stand in South Gallery), shows Crispin's Patent Sprigless Door Lock, and his own patent self-locking window and sash fasteners. Messrs. Walker & Worsley, Birmingham (Stand 120), exhibit compound double-action rim and mortise locks, and a great variety of other locks, sash-fasteners, iron safes, and general brasswork. In the compound double-action locks, the doors can be opened by turning the knob either way, pressing upwards or downwards. Iron safes and general brasswork are also on view. Chatwood's Patent Safe and Lock Company, Cannon-street, E.C. (Stand 61), present a selection of their "Invincible" and four lever hand-made locks, and their patent fire and thief resisting safes. Messrs. Nettelford & Sons, High Holborn (Stand 35), have a general display of lever and guardian locks, spindled lock furniture, sash fasteners, with a fine assortment of cabinet brass foundry and builders' ironmongery. The exhibits, as a whole, are good and attractive. Messrs. Frederick Whitfield & Co., Oxford-street, Birmingham (Bay 10), exhibit wrought-iron doors and frames for bankers' vaults, office fire-proof rooms, for large warehouses, &c. The specimens are commendable. The exhibitors also show their patent screw-bolt and other safes.

**Kitcheners and Ranges.**—Messrs. Steven Bros. & Co. (Stand 45), make one of the best displays in this department. Especial mention may be made of their "Leamington" kitcheners, but they show a variety of other ranges. Messrs. Ashton & Green (Stand 69) have a representative display of these goods, including Dow's patent close and open fire-range. Leamington and other ranges are shown at this stand, including a very compact one which is christened the "Master" range. It is self-contained and requires no brickwork. House-owners and builders should look at it. Mr. W. Addis, of Leicester-square (Stand 28), has, as usual, a good show of kitcheners and ranges. Among them we may mention a fine Leamington range, with grill, "Addis's Improved Open and Close Kitchener," Badger's patent "Lifting-fire kitchener," and Cuddy's patent "Economic" cottagers' kitchener, which is very compact and convenient, affording a large oven. Mr. William Stobbs exhibits James & Kirtland's "Beebe" range (an American invention), which burns either anthracite, coke, or common coal. The "Kalo-Kapnos" range, exhibited by Messrs. Clark, Barnett, & Co., is devised on the same principle as the "Kalo-Kapnos" stove, elsewhere mentioned. Messrs. F. W. Reynolds & Co. (Bay 4) show some good serviceable ranges and kitcheners. Messrs. Newton, Chambers, & Co., of Thorncliffe Iron Works, Sheffield, exhibit a large "Yorkshire" range, with four ovens, and one of their more generally serviceable "Thorncliffe" ranges. This firm enjoys great repute for goods of this kind.

**Chimney-pieces.**—Messrs. Ashton & Green (Stand 69) have a most attractive show of very fine chimney-pieces, particularly noticeable among them being the one in pure statuary marble, which has a sculptured figure in front of each pilaster. In the same row are some other remarkably good chimney-pieces in Belgian, Italian, and other marbles. The same firm are also exhibitors of enamelled slate chimney-pieces

(one of the specialities of their manufacture) and of chimney-pieces in wood. Mr. Walker, of Bunhill-row, exhibits, in conjunction with the grates and fenders of Messrs. Steel & Garland (Stand 64), a number of very good chimney-pieces in walnut wood. Messrs. F. W. Reynolds & Co. (Bay 4) have a good display of English and foreign marble chimney-pieces. The Coalbrookdale Company (Stand 38) are exhibitors of delicately finished cast-iron mantelpieces and overmantels in the Adam and other styles. They are remarkable for excellence of workmanship. Mr. W. H. Lascelles (Stand 153) shows some very good and cheap mantelpieces in red and other concrete, designed in the mode just now fashionable. Mr. Tagnon, of Gray's-inn-road (Stand 109B), makes a good display of marble chimney-pieces.

**Methods of Glazing, &c.**—Messrs. W. E. Rendle & Co., of Westminster, show their patent "Aome" system of glazing, which has been and is being largely used, and with great satisfaction to the users. It has been adopted by the Government for dockyard and other buildings, and also by railway companies. Within the glass house which is erected in illustration of this system Messrs. Rendle Brothers exhibit their almost magical "Electric" paint-remover, favourably noticed by us in some detail at the last of our last volume. Visitors should certainly witness the tests that will be made of it during the exhibition. In the Gallery (Stand No. 5), Mr. T. W. Halliwell, of Brighouse, shows his patent "Perfection" system of glass roofing without the use of putty. It is a very good system, its characteristics being strength and simplicity. Equally deserving of note is the same exhibitor's patent method of roof covering in zinc, lead, copper, or corrugated iron. By this system no rivet or bolt-holes are required in any of the sheets of metal, and no ridge-rolls are required. A roof covering made on this principle can be very quickly put together, and is very light. Another very good system of glazing without putty is that shown by Mr. C. Causley, of Shacklewell (Bay No. 13). It combines strength with elasticity and lightness, is perfectly water-tight, carries off all water of condensation, and allows for expansion and contraction. The horticultural building which is erected as an illustration of the employment of the system (which is, however, applicable to skylights of all kinds) is provided with a lifting ridge which can be by means of simple mechanism be at once raised vertically for ventilation, while at the same time entirely excluding rain. Other systems of glazing are exhibited by Messrs. W. Lawrence & Son, of Stevenage, and Messrs. Tracy & Son, of Ilford.

**Shutters and Blinds.**—Messrs. Hodgkinson & Clark, Canada Works, Birmingham (Stand 46), exhibit variously affixed revolving shutters and blinds. Their stand in the hall is a large and attractive one, being in itself a house or office in which their systems of shutters and blinds are embodied in the construction. The speciality of the firm for this year is a model of revolving shutters, partitions for the division of schools or other rooms into compartments when required. They also exhibit a specimen of their fireproof theatre screen or curtain, in iron which would completely shut off the rest of the building from the stage. This fireproof screen can be made to any ordinary size without vertical divisions, or up to a width embracing 48 ft. In fact, this screen is an iron curtain, and the revolving principle. Messrs. Clark, Barnard & Co., Rathbone-place, Oxford-street (Stand 34A), exhibit their widely-known patent and coiling shutters, and various castings in bronze and iron. Mr. J. Stokes, Ulverston, Lancashire (Stand 24B), exhibits his revolving shutter worked by patent balance-weight motion, is proved spring motion, or winding-gear; also his draught-excluder. The specialities put forward in the present exhibition are the "Patent Revolving School Divisions," worked by balance-weight motion.

**Electric Bells** are shown at Stand 107, in their varied applications, by Messrs. Young & Bus. Their exhibits include an electric letter plate and bell, and a simple system of electric burglar alarms, intended to give immediate warning of the opening of a door or window. The system is instantaneously put into or out of gear by the movement of a switch. The exhibits are very well worthy of the attention of visitors. One advantage of Messrs. Young & Bus's system of electric house-bells is that pendulum signal is used, saving the trouble of replacement.

\* Continued from page 340, ante.



**Gas-fittings.**—Messrs. D. Hallett & Co. have a very good display of gas-fittings, including the Siemens regenerative gas-lamp, which, we observe, is being tried (and with good results—at any rate, so far as lighting-power is concerned) by the City authorities in that part of Holborn between the Viaduct and Holborn-bars. Mr. H. Conolly, of Hampstead-road (Stand 47), is also a prominent exhibitor of gas-chandeliers and lamps, and a very good show he has. Messrs. Wells & Co., of Shoreditch, are among other exhibitors of this class of goods.

**Gas-stoves** are shown in great variety by Messrs. Deane & Co., of London Bridge, the London agents of Mr. Thomas Fletcher, of Warrington, who has given great attention to the subject, and with remarkably good results. Not the least interesting of these exhibits are the several portable appliances showing the application of gas to various industrial purposes. Messrs. Hallett & Co., of Holborn, are also exhibitors in this department, and show some good cooking and heating stoves.

**Lifts.**—Messrs. Clark, Barnett, & Co. (Stand 34A), show a very good safety-lift, which is self-stopping, both at the top and bottom of the shaft. It is very easily controlled. Messrs. Waygood & Co. (Bay 14), are also exhibitors of self-sustaining safety-lifts, as well as very convenient dinner-lifts.

**Ornamental Zinc-work** is shown by Messrs. R. W. Hale & Co., of Chatham-street (Stand 7), who have some very good dormers and finials. In the same class of work Messrs. Trogdon & Co. (Stand 60) show, as on previous occasions, a high degree of excellence in workmanship.

**Pavement Lights.**—Hayward's patent semi-prismatic reflecting lens pavement lights, together with floor-lights, coal-plates, &c., are shown by Messrs. Hayward Bros. & Ekestein, of Union-street, Borough. That they are highly appreciated is shown by the large extent to which they are used, and they should be more so.

**Builders' Tip-up Carts** are shown by (among other exhibitors) the Bristol Wagon Works Company, whose exhibits include one of Macretson & Hek's patent cart for contractors and builders, which has many good qualities to recommend it.

**Gas Engines** are well represented by the Otto, exhibited by Messrs. Croseley Brothers (Bay 14A); this is an established favorite. A new aspirant for favour in this direction is shown by Messrs. Lewis & Lewis, of Cambridge Heath-road, in Bay 18. The Turner Gas Engines, shown by the Turner Gas Engine Company, 36, Albion (Stand 129), appear to possess some good points. The "Ord" gas engine is shown at Stand 149, by Messrs. Henry Warr & Co. It deserves attention.

The Asphaltic Wood Pavement Company exhibit, at Stand 119A, specimens of the materials used, and models and sections of roadways paved by them. This company's system of wood paving is undoubtedly one of the best of the many systems which have of late years been tried. It is certainly far superior in respects to some systems which have been put forward.

Exigencies of time and space compel us to postpone mentioning, until next week, several other exhibits,—notwithstanding the number of columns we have already devoted to the subject.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the Ninth Ordinary Meeting of the Session, held on Monday evening, the 20th of March, Messrs. Jones, Vice-President, in the chair.

The Secretary announced the decease of the following member:—Archibald Sample Anderson, Associate, 3, Great James-street, Bedford-row, W.C.

The Secretary read a letter from the Right Hon. Sir Henry Ponsonby, signifying the Queen's approval of the award of the Royal Gold Medal, 1882, to Baron von Ferstel, Hon. and Corr. Member, and conveying Her Majesty's thanks for a Congratulatory Vote passed at the last meeting.

The portrait of John Whichcord, F.S.A., Past President, painted by L. Alma Tadema, R.A., Hon. Associate, and exhibited for the first time to the members, was formally presented by Charles Barry, F.S.A., Treasurer of the Portrait Fund.

Mr. C. Barry said,—I think, sir, that though we have to thank Mr. Whichcord for having

consented to sit for his portrait, and to give to us and our successors the gratification of possessing it for all time, our thanks are infinitely more due Mr. Alma Tadema, who sits beside me here, for having undertaken a work in which we all feel so great an interest. I had the hardihood to ask a man like Mr. Alma Tadema to undertake this work, though I knew his position and the extreme value of his time, which, of course, no subscription such as we are able to raise can possibly compensate; and, therefore, I hope that the members will thank him in the warmest way for having undertaken the work which I so daringly asked him to do. You will notice that the treatment has an originality which is all his own. Instead of simply painting our Past President as a lay figure with an indefinite distance he immediately realised the idea which we wished to perpetuate, that he was a president. He therefore thought—and, I think, happily thought,—that an individuality should be given to the portrait, that it should be the President of the Institute, seated in the President's chair, and wearing the President's insignia. The result is that we not only have from Tadema's pencil a portrait of an honoured president, but I venture to say, I dare say the painter may blush, I do not know whether he is given to blushing,—but I venture to say, even at the risk of his blushing, that we possess a work of art far superior to anything that we have hitherto possessed of the kind. Now, Mr. Vice-President, as the treasurer of the fund, I may be permitted to remark that, out of 1,000 professional members, just 102 have at present the pleasure of presenting this portrait to the Institute. I need hardly say that from 102 architects no kind of compensatory sum could be raised,—although many of the subscriptions are very generous,—no kind of sum could be raised which could be of any adequate recompense to our friend Mr. Tadema. But I should like to add, sir, in conclusion, that I do not propose, as treasurer of the Whichcord Portrait Fund, to close the account for about a fortnight's time, and I should like that fact to be known to the other 900 professional members, for there must be many amongst them who will not allow their names to be absent from the list of subscriptions.

The Chairman.—It affords me great pleasure on behalf of the Institute to accept the noble and handsome gift which Mr. Barry has just presented. If our friend and Honorary Associate, Tadema, has found a good subject in our Past President to paint, our Past President has had an excellent artist to paint him.

The thanks of the Institute were then voted by acclamation and with loud cheers.

L. Alma Tadema, R.A., Hon. Associate.—Mr. Chairman, gentlemen, I rise to thank you for the kind way in which you have received my small efforts to show interest in this noble Society, to which I am proud to belong. You know that I have a special inclination to love architecture. I have shown it to you often in my works, and that is really the sincerest way of showing what one loves. Therefore I was really gratified when Mr. Barry thought of me in reference to the portrait of Mr. Whichcord. I have besides learnt, on more than one occasion, to appreciate that kind man whom I have had the happiness to paint for you. He has grown upon me since he came to sit to me, and become quite a friend. So I have to thank you for having given me the opportunity of counting one friend the more. Moreover, a painter tries to make a picture, but what he looks for, above all, is a little appreciation of his efforts, and that I have found so abundantly here, gentlemen, that I really feel inclined to do what Mr. Barry said I was going to do—to blush.

Thirteen Fellows and thirty-eight Associates were duly elected by ballot during the evening.

**Public Architectural Competitions.**—The Chairman reminded the meeting that an amended paper, entitled "Suggestions for the Conduct of Architectural Competitions," had been for some considerable time in the hands of members; that a statement of the whole course of procedure which had taken place in connection with the discussion of the matter of competitions had been published in a recent number of the Journal of "Proceedings"; and that a further amendment, proposed by the Institute Special Competitions Committee, of the "Suggestions, &c.," was printed in the last number of the "Proceedings." A discussion took place, and it was ultimately decided that a special meeting should be called to continue it.

## BUILDING PATENTS.\*

### APPLICATIONS FOR LETTERS PATENT.

- 1,019. C. J. Mountford, Birmingham. Fire-resisting bricks and blocks. March 3, 1882.
- 1,021. L. Lenzberg, London. Door-roads and door-springs. March 3, 1882.
- 1,039. G. Gore, Balsall Heath, and W. Morris, Blackheath. Feeding domestic stoves and other grates. March 3, 1882.
- 1,047. L. A. Clark, Croydon. Fastenings for window-sashes. March 4, 1882.
- 1,065. J. Wetherill, London. Blinds or screens for windows. March 6, 1882.
- 1,077. J. J. Lisle, London. Fire-blowers. March 6, 1882.
- 1,109. T. W. Helliwell, Brighouse. Securing to roofs, &c., of buildings, sheets of metal. March 7, 1882.
- 1,113. R. Pearson, Hall. Combination stretch-traps. March 8, 1882.
- 1,123. J. Rawson, Balsall Heath. Apparatus for controlling the flow of water from water-closet cisterns. March 8, 1882.
- 1,143. E. P. Phillips, London. Spring hinges. March 9, 1882.

### NOTICES TO PROCEED

have been given by the following applicants on the dates named.

March 7, 1882.

- 4,818. H. Gibbons and A. Anthony, Hungerford. Locks and latches. Nov. 5, 1881.
- 5,018. W. T. Sagg, Westminster. Gas cooking apparatus. Nov. 16, 1881.
- 5,172. C. Piesser, Berlin. Water-closets. (Com. by R. Henneberg and A. Herzberg, Berlin.) Nov. 26, 1881.
- 5,391. W. R. Lake, London. Cesspools. (Com. by L. Mouras, Vesoul, France.) Dec. 9, 1881.
- 781. A. Ashwell, Dalwich. Indicating door fastenings. Feb. 17, 1882.

March 10, 1882.

- 4,902. J. F. Smith, Leicester. Construction of bridges, viaducts, &c. Nov. 9, 1882.
- 4,937. F. R. Baker, Birmingham. Spring hinges, &c. Nov. 10, 1882.

### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending March 11, 1882.

- 3,292. A. Sclanders, London. Door fastenings. Spring bolts are fitted to the top and bottom of the door, which pass into metal sockets in the door-frame. The spring keeps the bolts in the sockets while the door is shut. To open the same, the bolts are connected by cords or chains to two wheels, which are geared into each other. On depressing the lever of one of these wheels, both bolts are simultaneously withdrawn, and the door is released. (By J. P. Black, Nelson, New Zealand.) July 29, 1881. Price 6d.
- 3,339. L. Bessel, Isenlohn, Germany. Locks and bolts. The sliding bolt is so arranged in combination with a lock-spring that when the bolt is in the closed position a projection on it enters a hole in the spring, and is locked. To release the bolt the spring has to be depressed. (Pro. Pro.) August 2, 1881. Price 2d.
- 3,351. E. J. Hill, Westminster. Hanging or supporting window-sashes, &c. A rod is attached to the window-frame vertically, and on the sash is a piece of metal having on one end a hole large enough to work easily over the rod while it is in a horizontal position, but when it is moved out of this the hole grips the rod, and prevents the sash from being moved. (Pro. Pro.) August 2, 1881. Price 2d.
- 3,354. A. B. Carpenter, London. Sash or window fastenings, &c. The lever is locked by a spring lever, which rises after the locking lever is turned to fasten the sashes, and prevents its being withdrawn. A stud is arranged to press the spring lever down when it is required to open the sashes. (Pro. Pro.) August 3, 1881. Price 2d.

## BAYLAN, GLAMORGANSHIRE.

The new church here, which has been built entirely at the expense of Mr. G. Llewellyn, of Baylan Hall, from the plans of Mr. John Pritchard, the diocesan architect, was consecrated last week. The style is Geometric; it is cruciform on plan, with central tower and spire. The nave and aisles are of equal height. The walls are built in thin courses in contrast with thicker ones; the dressings are in red sandstone, promiscuously interspersed with green, both from the Forest of Dean. The tower and spire are of wrought ashlar of the same stone; the tower above the roof takes an octagonal form, the angles being filled with pinnacles. The

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street.



entrance is by a porch on the south side, on each side of which are the heads of the bishop and the founder,—good likenesses. Internally, the church consists of a nave, with an arcade on the north side, a choir beneath the tower, with transepts and a sacristy. The nave is lined with stone, which is of a light green, with bands of pink alabaster (Penarth) and a dark red stone. The roof is of oak; the benches are of oak, boldly moulded and carved. The whole of the pavement is glass mosaic. The lower arches spring from corbelled shafts with spirited carved caps; the shafts spring from the heads of the four Evangelists with their insignia; those on the north and south rest on a king, queen, bishop, and a warrior. The roof under the tower is groined in coloured stone. The stalls are of oak, doubly arched with cusped arches, and carved in the spandrels,—the backs are partly opened to the transept; there is an ascent of seven steps of polished Devonshire marble. The chancel is inclosed by brass gates; the mosaic floor here is very rich in colour and design. The walls are almost entirely of pink alabaster, with a few bands of green and red stone. On the south are the sedilia and credence, gabled and crocketed above, with green and white marble shafts and carved caps; on the north side is a handsome sepulchral recess for the founder's tomb. The reredos consists of an arcade of alabaster the whole width of the chancel, boldly moulded and carved, gabelled and crocketed above, supported by shafts of green and white marble, with carved caps and bases of green stone. The three arcades above the altar are corbelled off to admit of a marble slab incised in black and white (subject, the Resurrection). The design for this was by Mr. Armistead, R.A. The roof is panelled with ribs springing from angels holding emblems of the Passion. The pulpit is octagonal, with moulded and tracery panels in red sandstone; above is a rich moulded and carved cornice in alabaster; the stem of the centre pillar and eight columns, with crocketed gables springing from heads; the centre panel is a sculpture of Christ dispersing his disciples ("Go ye and teach all nations"). The south is of greenstone inlaid with alabaster, supported on eight pillars, with boldly-carved cluster caps.

The organ is by Mr. Willis; the stained glass by Messrs. Morris & Co.; the wood and stone carving by Mr. Wormleighton, of Cardiff; and the bells are by Mr. Taylor, Loughborough.

#### CHURCH OF ST. JOHN THE EVANGELIST, ASTHALY, NEAR WITNEY.

The above church has lately been enriched by the filling with stained glass of the west window, as a memorial to the late Mr. John Collier, of Salters' Hall, City. The two lights contain allegorical figures of Faith and Hope, draped mainly in white, which are well thrown up, being set in a richly-coloured background having vine-leaves and branches running through it. Under the respective figures are the texts, "Watch, stand fast in the faith," and, "For in thee, O Lord, do I hope." The tracery piece between the lights contains the figure of an angel, with emblems, treated on a background to agree with the lights. Beneath the window is a brass plate, bearing the following inscription:—"To the glory of God, and in memory of John Collier, who fell asleep on the 3rd day of June, 1881, aged 53 years."

The work has been carried out in the fourteenth-century style, to accord with the architecture, and is by Messrs. John Hardman & Co., of Birmingham.

#### WIESBADEN RATHHAUS.

The readers of the *Builder* were informed at the time that the municipal authorities of Wiesbaden had opened a prize competition for a new Rathaus or town-hall for that city. The number of architects applying for the programme of particulars has been very large, upwards of five hundred having already been despatched. The applicants are not confined to Germany, but a considerable contingent belong to Austria, England, Switzerland, Belgium, Russia, and Italy. Since public notice was given of the Wiesbaden competition, the much more important contest has been opened for designs for the new Imperial House of Parliament for Germany. As the time for the sending in of the drawings for the latter scheme is fixed for June 10th, and as the competition is limited to German architects, all the most eminent of

whom are expected to participate in it, the Wiesbaden authorities have resolved to extend the time allowed for sending in designs for their new Rathaus from the 15th of July to the 15th of September next.

#### LEYLAND LOCAL BOARD: COMPETITIVE SCHEME.

THE Board having recently invited engineers to send in plans and estimates of the cost of the whole of the works necessary for the water supply of this district, the following gentlemen submitted schemes, viz.:—Mr. Henry Bancroft, Manchester; Mr. P. L. Edinger, Walton-le-Dale; Messrs. Gotto & Beesley, Westminster; Messrs. Goodison, Atkinson, & Ford, Liverpool; Mr. Joseph Harding, Preston; Mr. George Heaton, Wigan; Messrs. Moorson & Sacré, Manchester; Mr. Alfred Moore, Manchester; Mr. E. Timmins, Runcorn; and Mr. William Wrennall, Liverpool. The Board ultimately, at their meeting on the 16th inst., decided to adopt the scheme submitted by Mr. William Wrennall, Liverpool, who is consequently selected to carry out the works.

The scheme submitted by Messrs. Goodison, Atkinson, & Forde was considered to be second in merit, and they were awarded the sum of 20l.

#### NEW THEATRES.

THE public demand for new theatres appears to be as yet unsatisfied, in spite of the numerous additions that have been made to their number. The Royal London Panorama, on the north side of Leicester-square, the site of which was formerly occupied by Savile House, and where the Panorama of the Battle of Balaklava was recently exhibited, is about to be converted into a theatre, under the title of the Pandora Theatre. Plans have been prepared for this purpose by Mr. Thos. Verity. The theatre, which will contain about 2,000 persons, will have ample corridors and staircases, with additional exits into Lisle-street, in the rear.

Another theatre is also proposed to be built on the south side of the Strand, on the site of No. 106, Strand and the Occidental Tavern, Fountain-court.

#### OBITUARY.

Mr. Henry Alty, C.E.—The inhabitants of Plymouth learned with no ordinary pain of the death of Mr. Henry Alty, the Borough Surveyor. The event was sudden. The deceased gentleman was but thirty-eight years of age, but leaves a wife and a family of eight young children to lament the untimely calamity. Mr. Alty was elected rather over three years since to the office of Borough Surveyor. There were several candidates for the post, all highly recommended. Mr. Alty, who was a native of Wigan, and who had been holding a less responsible position at Barrow-in-Furness, prepossessed the Council by his air of business-like capacity and appearance of quiet confidence. He was busily engaged at the time of his death in conducting on behalf of the town the negotiations connected with the drainage of Compton, and in the matter of public improvements he entertained the strength of his convictions, and was never without a strong following.

Mr. Archibald Sempie Anderson.—On Friday in last week, Dr. Thomas, Coroner for Central Middlesex, opened the inquest at 138, High-street, Camden Town, on the body of Mr. Archibald Sempie Anderson, aged 27, who was killed on the previous evening by falling from the roof of the above-named house, the residence of his father. Mr. Alexander Anderson identified the body as that of his brother, who had been in ill-health latterly, and under the care of Dr. Miller, of Hampstead. That gentleman saw him on the day of his death, and recommended change of air and a sojourn at Hastings. Witness last saw him alive at dinner-time on Thursday, when he seemed exceedingly melancholy. He had been upset in his mind lately, and working hard at his studies as an architect. At five o'clock on Thursday evening, witness saw a crowd in the street, and then found that his brother had fallen or thrown himself from the top of the house, and was lying dead in the roadway. He had had no reason for suspecting that his brother would commit suicide. Mr. Alexander Anderson, senior, the father of the deceased, gave further evidence to the same effect. The jury returned a verdict of "Suicide while of unsound mind."

#### THE BOARD OF WORKS AND NEW ROADS.

At the Greenwich Police Court, Chas. Pearce, of Havelock-road, Forest-hill, builder, was summoned by the Board for not making a street, called Pearceo-field Avenue, David's-road, Forest-hill, with two entrances, as required by 25 & 26 Vic., c. 102, s. 98, and the Board's By-law.

Mr. Burton, solicitor, appeared for the Board, and Mr. Firth, M.P., for the defendant.

The facts of the case were as follow:—Mr. Pearceo had applied to the Board for their sanction to the above street with one entrance, which application was refused. Notwithstanding this, he proceeded to build and lay out the road. Finding, on the 1st of March, that proceedings were about to be taken, he put up a hoarding, and wrote on it, "Pearceo-field Avenue, Private Road."

Mr. Firth, on the part of the defendant, contended that the Board had no power to interfere, the road being a private one; that the section of the Act did not apply; and that the By-law was *ultra vires*.

On behalf of the Board it was contended that the Board had the power to compel the road being made with two entrances after the defendant's application to the Board, and the case of "The Metropolitan Board of Works v. Stead" was cited as being similar in principle, and that the By-law was a good one.

Witnesses having been called, the defendant consented to make the two entrances, and the case was adjourned for nine weeks to enable the work to be carried out.

#### BRICKS.

Sir,—Can any of your readers refer me to any works where waste heat is utilised for drying bricks? P. P. C.

#### COLOURING PORTLAND CEMENT.

Sir,—About two years since I erected a small building to be used as a hospital for infectious diseases.

It is built of bricks, and the walls inside are rendered and set with Portland cement, which has not dried all the same colour, but in large spots of stains,—very much resembling damp,—which are perfectly dry, sound, and hard.

Can any of your readers recommend me the best kind of material for coating or painting such walls impervious to necessary washings? W. S. M.

#### A WORD TO THE MASTER BUILDERS.

Sir,—Being a practical man of considerable experience, I wish to say a word to the master builders through your pages, for they do not appear to see their own interest.

It is now getting very general to appoint a general foreman. That, sir, is the greatest mistake possible, for there is not a man to be found capable to fill such an appointment. It is not to be supposed that there is a man living that is thoroughly practical in all the building branches.

When a man of that description undertakes to tell practical workmen how to do their work, I think, sir, you will say with me that it is to the interest of the employer, but quite to the contrary, and also a great insult to a man who knows his business to be made to work according to his directions; but the workman must do so.

Why do not the master builders act generally in the same manner as the late Cubitts, Peto, and Myers used to do, viz., appoint a thorough practical foreman over each trade? Work would then be done as it used to be, in a proper manner.

But now many masters are getting into the building line who have no general knowledge of the business, and they appoint these general blockheads?

The consequence is that alteration after alteration takes place, work is messed about, labour is spent in vain, and eventually many masters are brought to ruin, and the employer is charged extra for this mismanagement. T. M.

#### DECAY OF BUILDING MATERIALS.

Sir,—I have read the letters of your correspondents on skilled labour and the use of inferior materials, that causes such rapid decay in the buildings erected during the last twenty years, but I have not observed any remarks why the masonry externally disintegrates so rapidly at the present time, as compared with that in ancient buildings, or St. Paul's, Greenwich Hospital, and the Reform Club, to wit:—I think it is also desirable, in connexion with the present subject, that some of your correspondents



dents should also give their opinion and experience as to whether the application of machinery disturbs the face of building stones, and causes the rapid decay observable in buildings of recent date. G. R.

### CHURCH-BUILDING NEWS.

**Cowley St. John (Oxon).—**The new district Church of Cowley St. John is situated in the Cowley-road, in close proximity to the University Cricket Ground and National Hospital for incurables. The style is Early Decorated, the walls being of Charlbury stone, with Box Ground weather stone external dressings, and Coreham Down stone internally. The chancel was built seven years ago, and the remainder of the church will be in accordance with it in style. The church will accommodate 730, and consists of nave, 69 ft. by 25 ft.; north and south aisles, 54 ft. by 12 ft.; north and south transepts, 14 ft. by 15 ft.; tower, 16 ft. square; vestry, 17 ft. by 17 ft.; organ-chamber, 17 ft. by 8 ft. The tower is at the west end, and when completed its total height, with spire, will be 183 ft. It will have a wooden polygonal panelled roof inside; its height in nave from floor level to ceiling will be 43 ft. There will be five bays in good proportion on each side of nave, with an arcade clearstory above. The nave is to be commenced at once. Mr. Marston Mowbray is the architect.

**Greatworth.—**St. Peter's Church, Greatworth, was reopened on February 17th, after restoration. The church consists of a chancel, nave, and tower at the west end. The structure is a small one, the nave being 33 ft. by 24 ft., and the chancel, 20 ft. by 17 ft. The chancel is of Early English work, but the nave is modern. The old west gallery has been removed, and a ringing-chamber substituted, and underneath there is a vestry. The chancel-arch is new, and the chancel itself has been raised two steps. The old high pews in the nave and chancel have been replaced by new seats of pitch-pine. The chancel and aisle are paved with Webb's Worcester tiling, and the other parts of the flooring are laid with ash blocks, set in concrete. The old pulpit has been retained. The restoration is estimated to cost 400l. The architect employed in the work is Mr. H. R. Gough, of London. Mr. Cotterill, of Culworth, was the builder.

**Hedworth.—**The new Church of St. Nicholas, Hedworth, South Shields, was consecrated on February 17th. The new church consists of a nave of four bays, 67 ft. by 21 ft. internally, and a north aisle, 65 ft. by 8 ft. It is intended, as soon as the funds can be raised, to complete by adding a chancel, 23 ft. long, with organ-chamber and vestry on its north side, and also south front to the nave. The building is of stone, in the Decorated style, and has open roofs of unvarnished deal, covered with red tiles. The seats and other fittings are also of deal, ribbed with bees'-wax, but not varnished. The hole of the work has been carried out by the contractor, Mr. W. Foster, of Croxdale, from the designs and under the supervision of Mr. C. Hodgson Fowler, architect, Durham. The altar cloth was supplied by Mr. W. E. Barle, of Durham, under the architect's directions.

**Cheshire.—**The annual meeting of the Cheshire Loosan Church Building Society was held in the Chapter-house, Chester Cathedral, on the 23rd ult. The report stated that the following amounts have been made during the past year:—St. Matthew's, Birkenhead, where it was proposed to build a new church at an estimated cost of 4,500l., a grant of 160l. St. Thomas's, Chester: Application was made for assistance towards the enlargement of this church, and a grant of 160l. was made; the increase of sittings was 10. St. Paul's Church, Coppinhal, Crew: A grant of 75l. was voted towards the cost of a new south transept, setting free 150 sittings. A grant of 75l. was made towards a new porch in the place of a much dilapidated old porch.

**Newburgh (N.E.).—**At a recent meeting of the vicars of the parish of Newburgh, Mr. John King, C.E., explained the proposed alterations & repairs on the church, and it was agreed that the seats be remodelled, provided the congregation approve; also that the sounding-board and the back of the pulpit be removed, the pulpit lowered 9 in. The offer of Mr. Ingeston, merchant, Edinburgh, to put in a lead-glass window on the south side of the porch, which fronts the street, was accepted. Edgar showed a sketch of the design for

the window, being subjects from the life of Jesus Christ. The design was approved. The total estimated expense of the alterations, not including the stained-glass window, is 250l., which has been nearly all subscribed.

**Plymouth.—**The new Church of St. Peter, Wyndham-square, Plymouth, has been consecrated. The style is Early English. On the ground plan the building shows a wide nave and aisles, with north and south double transepts, and chancel. The tower is 32 ft. square, and is eventually to be carried one stage higher than it is at present. The tower entrance, which faces Stoke-road, is a main feature of the building. There is a porch in the thickness of the tower, and the tympanum over the double doorway is eventually to be filled in with mosaic. There is a narrow balcony over this western door which can be used for the purpose of preaching on the occasion of overflow or mission services. In this lower stage of the tower is a large double tracery window, and the bell-ringing stage is marked by narrow arched lights. The south porch is not yet built, but it will eventually be the principal entrance, and will be rich in carved stone and with figure sculpture over the doorway. The double transept on the south side will have an apsidal chancel. The scorum of the old church, built from designs by the late Mr. Street, is retained, and the chancel is under the main roof, so that all the lines of the nave roof run from end to end and give greater idea of length. Subjects from the life of St. Peter will be painted on the panels, at present plastered, between the nave arcade and clearstory. Twelve niches, six on either side, over the arcade dividing the nave from the transepts, will eventually be filled with sculptured figures of the Apostles, and the angles of the chancel are marked by four angels holding different instruments. The windows are nearly all designed to be filled with stained glass; two in the south transept are in hand, being painted by Mr. William Bell, and the whole of the windows in the transept are to contain subjects connected with the Holy Eucharist. There are to be seven lancet lights in the apsidal end of the chapel. The windows in the aisles will contain representations of the miracles of our Lord, and in the windows of the west end of the aisles there will be in one "The Baptism of our Lord," and in the other "Jesus Blessing Little Children." In the tower window there will be a representation of the descent of the Holy Ghost. Four coronae which light the chancel are the special gift of a lady. The architect is Mr. G. Fellowes Prynn, the son of the vicar, and the builder was Mr. Alfred Gay, of London. The stonework was done under the foremanship of Mr. Ellis. The glazing of the windows with tinted glass is the work of Messrs. James & Co., of London, and the wrought-iron work was supplied by Messrs. Brawn & Co., of Birmingham, and Messrs. Ellis & Rice, of London, the latter firm having in hand a wrought-iron screen to be presented by Mr. Swan. The heating apparatus is by Mr. Grady, of London. The gilt coronae were manufactured by Messrs. Singer & Co.

**Noss Mayo.—**The new church here, which is being erected by the munificence of Mr. Edward Charles Baring, of Membland Hall, is, so far as the actual fabric is concerned, almost complete. It is expected that the consecration will take place on the 29th of June, the festival of St. Peter, the saint to whom the church will be dedicated. The structure is situated upon the steep hill slope and on the Revelstoke side of the lovelycombe through which the Yealm meanders. The building is Perpendicular in style, and, at the express wish of the donor, is altogether a counterpart of a fine old fifteenth-century West-country church. The architect is Mr. James Piers St. Aubyn. Mr. Baring's own staff of workmen are building the church, under the superintendence of Mr. T. W. Crosbie, the clerk of works to the estate. The church is built of local dun stone, with dressings of grey Dartmoor granite standing out sharply upon the rugged slope. It has a western embattled tower, with a turret rising above its battlements at the north-west corner. The body of the building consists of nave and north and south aisles, divided, certainly, by arcades of granite, all the columns supporting which are monoliths. The fall in the ground gives an opportunity for the formation of a crypt upon the north side, and Mr. St. Aubyn has utilised this peculiar formation in the site by placing the vestries and choir rooms below the north aisle. The approach

from these apartments to the chancel is by a broad winding staircase. All the windows are full of tracery, and this is wrought, like the rest of the masonry, in Dartmoor granite. In the aisles the windows are three-light, and the chancel east window is a five-light one, and the tower window has four lights. The roofs are covered in by slates raised at Worswell Point, on Mr. Baring's estate. The east and west, as well as several other of the windows, are to contain painted glass by Messrs. Fouracre & Watson. The roofs are wagon-shaped, and, like the rest of the woodwork, are all framed out of "hearts of oak." The various intersections are stopped by carved bosses, the work of Mr. Harry Hems, to whom the whole of the carved and sculptured work has been entrusted.

### Books.

*An Elementary History of Art: Architecture, Sculpture, Painting.* By N. D'ANVERS. Second Edition. With Preface, by Professor ROGER SMITH. London: Sampson Low & Co. 1882. This thick volume, of nearly 700 pages, which is referred to in the introduction as "this little book," is a publication which, founded on a German original, comes under the class of works which arise out of the process sometimes called "book-making." For a volume which has not, and does not profess to have, a single original idea or statement, we should be inclined to say, "something too much of this." The now general idea that one ought to know something about art has led to the production of a good many handbooks of this class, the use of which lies in their supplying the superficial facts in a superficial manner for those who want to get a little knowledge about the arts without much trouble or thought. We cannot say that we are much in favour of such books, to the production of which some labour certainly goes, but which are written mostly with as little expenditure of real thought as goes to the reading. The present work may be said to be a favourable specimen of its class, but we can hardly give it more special commendation than is implied in saying that Professor Roger Smith, in his brief introduction, makes what he considers an excuse for this superficial character of the book, which he can hardly avoid admitting, by observing that the present movement in favour of the arts is an essentially popular one, and that therefore nothing could possibly be more suited to the wants of the day than the publication of works on the fine arts calculated to give sound information in a popular form. We should have said that if the present generation were disposed to prate about art in a very superficial manner, they were rather in want, intellectually, of publications which would lead them to think a little more deeply on such subjects. In a commercial sense, no doubt, the conclusion suggested in the introduction may hold good.

The unsatisfactory result of dealing in this popular and superficial manner with architecture, for example, is shown in various passages in the portion of the work devoted to that art. There is at page 83, for example, a show of explaining one of the chief formative causes of Gothic architecture, the difficulty of adjusting vaulting surfaces and their curves of intersection, but no diagram is given, the explanation is brief and incomplete, and no one who is not already acquainted with the subject will be likely to derive any clear idea of what is meant from the passage. Indeed, an incorrect idea is conveyed, and a semi-popular fallacy supported, in saying that "pointed arches are capable of being applied to vaulting bays of any shape or size, as they can be made of equal height whatever their span." This implies that the problem of making the various lines of vaulting work together was entirely solved by the pointed arch, whereas the solution was still theoretically incorrect, and sufficiently so practically to lead to a great deal of trouble in attempts to "fudge" the curves so as to make them work into each other, which the fan-vault only at last achieved. A few scientifically-worded sentences and two or three small diagrams might have rendered this and other points in regard to this important part of Gothic architecture intelligible to those readers capable of understanding it at all (there are many among average readers who never understand anything of that kind, however demonstrated); but the information given here conveys nothing distinct. But these formative causes in architecture are regarded with much interest by amateurs of intelligence



when fairly set before them. We have been witness of the interest with which people who had long looked at Gothic buildings sympathetically but superficially received the explanation, for instance, of the genesis of the moulded arch from the soffit-arch of the Roman and Romanesque period, shown in half a dozen chronologically arranged sections; this one little bit of demonstration evidently giving them a good many new notions about what Gothic architecture meant. A more carefully worded and concise treatment of the subject might have brought out important points like these, without any undue lengthening or elaboration. In regard to some points of architectural history light is let in upon the average reader. The idea, for instance, that the chief interest of Roman architecture consists in the fact that it was a combination and transition style, and formed the connexion between Greek and Medæval architecture, is one of which few people who have not professedly studied architecture have any inkling; and with this and other general truths as to architectural history the book may usefully inculcate them. But in details the architectural portion of the book is poor, and occasionally what may be called slipshod in expression. For instance, the Parthenon is said to be in the "peripteral style," which at once produces a confusion between two different uses of the word "style." It should have been the "peripteral form" (or "plan"), which might have been in any of the Classic "styles." But the treatment of Greek architecture generally is inadequate, and deficient in critical perception and precision.

The portions of the work which deal with painting and sculpture give a considerable quantity of historical information which is useful in itself, and might have been made as useful and compressed into a smaller space by the omission or curtailment of a good many of the original reflections on various great artists, which do not form very valuable reading. Sculptors of the present day,—those now living, that is to say,—are mentioned, but (intentionally) not criticised or characterised. Painters now living are not mentioned. Why they should not have the same degree of notice as sculptors we do not understand. Grinling Gibbons, by the way, is hardly to be called a sculptor, in the sense in which the word is usually understood. He was a carver of genius rather than a sculptor. A writer who couples the names of Canova and Flaxman as if they were kindred spirits has not a very true perception as to what makes the greatness of sculpture, or of a sculptor; and the omission of the name of Dalou altogether from the list of modern French sculptors is incomprehensible.

However, although we cannot point to the work as supplying exactly the handbook just now wanted, the general reader may find it an agreeable introduction to other and more precise guides on the subject of which it treats.

#### VARIORUM.

BERLEY'S "British and Continental Electrical Directory and Advertiser" (16, New Bridge-street), 1882, shows the astounding progress made lately in electrical science, and the large number of industries it has already brought into existence. We cannot agree with the editor in his condemnation of those inventors who are still trying to introduce certain systems of lighting dependent on the employment of electric batteries. Improvement or discovery in this direction might very much facilitate domestic lighting. Thousands of billiard-rooms, for example, in private houses, at present scarcely usable because of the heat and bad air, are waiting for arrangements that would admit of the introduction of electric lighting. — "Useful Information on Electric Lighting," by Killingworth Hedges (Spon), 1882, has reached a fourth edition, and now includes a chapter on the transmission of power. — More sixpenny books, and a good job too. We have before us Col. Burnaby's dashing "Ride to Khiva" (Cassell & Co.), "Hood's Own," full of funny cuts (Ward, Lock, & Co.), and, from same publishers, "Out of the Hurly-burly," by Max Adeler, with all the original engravings good, bad, and indifferent. — "Fairy's Academy Skits, 1881," sketched by Gordon Thomson, with notes by Nestor, are devoid of malice and not without fun. — "Wholesome Houses: a Handbook of Domestic Sanitation," by E. Gregson Banner, C.E., revised edition (Stanford), 1882, is devoted, as might be expected, to an exposition and recommendation of the Banner system. Those who wish to understand all about it will find it here.

#### Miscellaneous.

**Payment of Wages in Public-houses Prohibition Bill.**—A Bill has been introduced into the House of Lords by Earl Stanhope and read a first time, the object of which is to extend the operation of the Coal Mines Regulations Act, 1872, and the Metalliferous Mines Regulation Act, 1872, prohibiting the payment in public-houses, beer-shops, or other places mentioned therein, of wages to persons employed in mines, so as to prevent the payment of wages in public-houses to all workmen whatsoever. The third clause is as follows:—"From and after the passing of this Act no wages shall be paid to any workman at or within any public-house, beer-shop, or place for the sale of any spirits, wine, cider, or other spirituous or fermented liquor, or other house of entertainment, or any office, garden, or place belonging or contiguous thereto or occupied therewith. Every person who contravenes, or fails to comply with, or permits any person to contravene or fail to comply with this Act, shall be guilty of an offence against this Act. And in the event of any wages being paid by any person in contravention of the provisions of this Act for or on behalf of any employer, such employer shall himself be guilty of an offence against this Act, unless he prove that he had taken all reasonable means in his power for enforcing the provisions of this Act, and to prevent such contravention." The penalty for infringing the Act is not to exceed 10*l.* for each offence, and all offences against this Act may be prosecuted and all penalties under the Act may be recovered by any person summarily under the Summary Jurisdiction Acts. The Act is not to apply to Ireland.

**Erecting Wrought-iron Chimneys.**—A novel plan for erecting the casings of fire-brick hot-air stoves and wrought-iron chimneys is being pursued at the Pennsylvania Steelworks, Harrisburg. Two new blast-furnaces, with six Whitwell stoves, 60 ft. high and 18 ft. diameter, are in course of erection there. Instead of putting the bottom plates of the stove together on the ground, and building the rings up from the bottom to top, at the works mentioned a commencement is made with the top plates and top ring of the stove. They are first erected on the ground, and riveted and caulked complete; then with three very large screw-jacks, having a lift of about 6 ft., and placed at equal distances around the site of the stove, worked by men with winch-handles, this first ring is carefully and evenly lifted high enough to enable the workmen to put on the next ring of the plates, 5 ft. deep. This ring is also riveted and caulked complete; then another ring is added and lifted, and so on till the whole stove is completed. The wrought-iron chimney, 175 ft. high, for working these stoves, was erected in the same way.—*Iron.*

**St. Paul's Hammer-smith.**—A faculty has been obtained for the removal of this church, and to build a new church in its stead. The vicar, one of the churchwardens, and the architect of the proposed new church, were called in support of the application, which the parish at a vestry meeting had resolved upon. The expense of the whole was estimated at 16,400*l.*, and 6,500*l.* had been subscribed towards the erection of the new nave, where the services would be performed without pulling down the whole of the old church. The nave would cost 7,400*l.*, and there would be no difficulty in raising the balance, and when required the additional outlay for the new chancel and the proposed tower will be raised by voluntary contributions. There will be about 700 additional sittings.

**Ship's Self-registering Compass.**—A new, and what promises to be an important invention, has just been made by Mr. Robert Fickwell, civil engineer, Hull, and consists of a self-registering ship's compass, by means of which a diagram is produced, showing,—1. The exact steered course of the ship; 2. The length of time the ship has been kept on any course; 3. All the changes of the courses, and the exact time when such changes take place; 4. In the event of a collision at sea, the bearing of the ship's head at the time is clearly shown. The instrument will be on exhibit at the Naval and Submarine Engineering Exhibition, to be held next month at Islington.

**Proposed Hospital at Rugby.**—We understand the design of this work has been entrusted to Mr. Henry Wilson, architect, of Great James-street, Bedford-row.

**Steeple Claydon Church.**—A fine turret clock, showing time on one dial, has just been fixed in the tower of this church. Its manufacture was entrusted to Mr. J. W. Benson, of Ludgate-hill, and it is the gift of Sir H. Verney, bart. The clock strikes the hours on the tenor bell, weighing 16 cwt. The whole of the wheels are of hard brass, the main wheel measuring 14 in. in diameter, and, as usual with most clocks made by this firm, the escapement is 7 ft. long, and beats 1½ second of time with a bob weighing 1½ cwt.

**Royal Avenue Theatre.**—As some of the newspapers have described the front of this theatre, on the Thames Embankment, as being constructed of Portland stone, we are asked to contradict this and say the material used is the "corn-grit and bottom-bed" stone produced by the Cersham Down Quarry, in Wiltshire, belonging to Messrs. Yookney & Co., who supplied it to the contractors, Messrs. Kirk & Randall, under the architect's specification.

**The Air Within our Dwellings.**—In the report of the discussion on this subject at the Civil and Mechanical Engineers' Society, Mr. I. H. Collins was made to speak of "Wake's hydrastic calorific stove" as a means of introducing fresh warm air into rooms. What Mr. Collins really referred to was "Weeks's hydrastic calorific warming" and ventilating coil." We learn that a number of these coils are now being fixed for the purpose of warming and ventilating the new Synagogue, St. John's Wood, which is being built under Mr. Collins's direction.

**Asphalt Paving.**—We may add to our notice of the works done at the new Vestry-hall, Bermoudesey, that the whole of the asphaltum—viz., damp-course, and paving of the entire building,—was laid by the Brunswick Rook Asphalt Paving Company (Limited). The whole of the new platforms of the King's-cross Goods Station (3,000 superficial yards) are being laid with Brunswick Rook Asphalt, 1½ in. thick, by the Great Northern Railway Company.

**Salwarpe.**—New National schools here were shortly be opened. They occupy a site which was the gift of Mr. E. A. Gresley, to the parish and the premises comprise a "mixed" school, room, upwards of 42 ft. long by 18 ft. 6 in. wide and a classroom, 20 ft. long by a similar width. There are also porch, lavatory, out-office, &c. The contractors are Messrs. Read & Cook, Bromsgrove. The architect is Mr. John Collett of Birmingham. The cost will be about 1,100*l.*

**City Property.**—An important block of freehold property, situated in Tukes-house-yard was sold by auction, at the Mart, last week, Messrs. Farebrother, Ellis, Clark, & Co. The premises have two frontages to thoroughfares. The area occupied by the building is about 3,250 ft. and the rental value was estimated, 5,000*l.* per annum. The property realised 61,000*l.*

**The late Mr. Burges, A.R.A.**—At the sale on the 20th, by Messrs. Patnick & Simpson, of portion of Mr. Burges's library, his little volume of sketches produced 285*l.*; his collection of original measured drawings and sketches, 25 vols., 288*l.*; while many of the less important lots likewise realised high prices.

**Royal Society.**—The President and Council will hold a reception at Burlington House, Wednesday, 29th inst. This gives an opportunity for the introduction to the President of eminent men known to Fellows, but they must be personally presented. Cards have been issued for the annual conference on May 10th.

**The Memorial Stone of the Brentford Union Schools.**—Leweston, was laid on Thursday last by Mr. John M. Stedwell, Vice-Chairman of the Board of Guardians. Mr. Edwin Monson, jun., A.R.B.A., of Acton, is the architect, and Mr. Thos. Brauden, of Brentford, the builder.

**Manora Breakwater, Kurrachee.**—Price writes to correct a statement in his *l.* (p. 381, ante). His paper was read at a Institution of Civil Engineers in 1875-6, 1874-5.

**Two Churches** built by the Sheffield Chert Extension Society have just been consecrated by the Archbishop of York. They are both constructed of brick, and have been erected to designs by Mr. J. D. Webster, of Sheffield.

**A New Presbytery** is to be erected at Cleator, Cumberland. It will be built from designs of Messrs. Pugin & Pugin, Westminster Society of British Artists.—The preview at the Suffolk-street Galleries will place this Saturday, the 25th inst.



Davy, Hyères .....	112,851
Wright, Paris .....	110,000
Macchetti, Hyères.....	103,438
Bosquet, Marseilles .....	106,700

For farm buildings, Wrotham Hill Park, for Mr. Jonathan Rigg. Mr. Geo. Friend, architect:—

Builder.	Centre Block Complete.	Cart Horse Stables and Harness Room.	New System of Drainage.	Hay and Straw Sheds, &c.	Total.
E. Vaughan, Maidstone .....	1,790 0 0	2,115 0 0	£394 0 0	£640 0 0	£3,029 0 0
Wallis & Clements, Maidstone .....	1,740 0 0	198 0 0	325 0 0	630 0 0	2,933 0 0
Wheatley, Roubridge .....	1,775 0 0	182 10 0	335 3 3	583 0 0	2,972 11 8
Calland & Son, Rochester .....	1,457 0 0	125 0 0	373 0 0	470 0 0	2,415 0 0
Harryman, Lewisham .....	1,078 0 0	177 0 0	378 0 0	769 0 0	2,400 0 0
Wood, Brompton, Winchester (accepted) ..	1,387 0 0	99 0 0	313 0 0	529 0 0	2,319 0 0

For public baths and buildings at Kettering, Northamptonshire, for the Kettering Bath Company, Limited. Mr. R. W. Johnson architect. Quantities supplied:—  
 Farrell .....

For new schools at Rushden, Higham Ferrers, Northamptonshire. Mr. Sharman, architect. Quantities supplied:—  
 Smith & Son, Randa .....

For additions and alterations to Hendon Union Workhouse, Hendon. Messrs. Saxon Snell & Son, architects:—  
 Nightingale .....

For St. Paul's Mission Hall, Carlisle:—  
 T. Scott, Carlisle .....

For levelling, forming, and sodding proposed recreation ground for the Barmouth Improvement Committee. Mr. Thomas Roberts, C.E.  
 Powell, Barmouth .....

For the erection of a villa residence at Honor Oak, for Mr. E. P. Trenchard. Mr. W. H. Jervis, architect:—  
 Newman .....

For new Baptist Chapel, Grafton-square, Clapham. Mr. W. Niven, architect. Quantities by Messrs. Goodchild & Son:—  
 Dove Bros. ....

For pulling down and rebuilding three shops, 232 to 234, City-road, N., for Messrs. Roy & Cartwright. Mr. Geo. Treacher, architect:—  
 Colvill .....

For alterations and additions to the Capital and Counties Bank, Threadneedle-street, City. Mr. R. King, architect. No quantities:—  
 Spencer .....

For the erection of St. Luke's Church and Schools, Reading. Mr. Jas. P. St. Aubyn, architect. Quantities supplied by Messrs. J. & A. E. Bull:—  
 H. Higgs, Reading .....

TO CORRESPONDENTS.  
 H. L. H. H. W. F. P. R. P. R. T. H. A. J. E. J. W. F. O. F. H. W. D. I. E. M. E. W. B. E. C. S. J. H. Mr. W. F. P. O. H. S. S. S. O. S. P. H. W. O. E. F. D. J. A. W. W. C. E. T. R. G. D. O. E. J. J. S. & Son. J. W. S. W. H. J. W. & Co. T. E. R. E. O. J. S. & Son. J. W. S. E. A. H. J. J. J. J. A. W. J. J. R. E. P. C. D. E. C. A. S. J. & A. B. Mr. B. W. L. O. S. H. J. S. A. S. C. S. O. A. K. (cannot be answered off-hand. Take up at advice).  
 Two letters on the subject of the Custom House Ventilation reached us too late for consideration.  
 All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.  
 We are compelled to decline pointing out books and giving addresses.  
 Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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 Box Ground, Combe Down,  
 Corsham Down,  
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 50,000 feet cube in stock.  
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 of best quality, in blocks, or prepared ready for fixing. An inspection of the Doubling Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, 78, Charlotte-street, Portland-place, W. [Advtr.]

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# The Builder.

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SATURDAY, APRIL 1, 1893.

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### The Competition Question.

FROM the discussion on this matter, at the last meeting of the Institute (20th ult.), it would seem that a new question has been raised in regard to the subject, arising out of the recommendations of the Committee appointed by the Institute to consider it. One of the points recommended in the amended form of the "Suggestions for the Conduct of Architectural Competitions" was that in all large competitions there should be a double "concourse," first based upon a series of sketch designs open to any one in response to public advertisement, from among which a certain number should be chosen to compete in a more complete and finished set of drawings, the chosen competitors being paid for their labour. This principle, as we need not remind our readers, has already been acted upon in several instances, the earliest and most important one being the competition for the Manchester Town Hall. The system seemed to us calculated to do away with, or at least considerably to modify, the evils attendant on the immense expenditure of work for the mere chance of reward, which the competition system usually entails in the case of a projected building of any considerable size or importance. We say advisedly that it is "calculated" to attain this end, and that is all that can be said. If, in spite of the wording of such invitation, a considerable portion of the competitors persist in sending what are in reality finished competition drawings of the usual standard, though on a smaller scale, in the hope of cutting out, in the first competition, those who do not care to do more than the wording of the invitation calls upon them to do, it is impossible to prevent their doing this, and impossible to disqualify a competitor for merely doing better drawings than were required of him. Not only so, but the probability is that the competitor who does this will actually obtain an advantage over those who are content to send only what is asked for. He will certainly obtain more attention; it must inevitably be so; and more attention generally means a better chance of selection.

This is probably the view taken by the Leeds Architectural Society, who, as appears from the Journal of the Transactions of the Institute, have addressed to that body an emphatic protest against the proposition referred to, in a letter which was read at the meeting on the 20th ult. In the course of this letter they observe that "the burdens laid upon the profession through the system of competitions are already all but intolerable, and it would be strange, indeed, if

their weight were increased by the action of those who are, or should be, interested in lightening them. The difference in labour and expense between preliminary sketch designs (so-called) and fully-finished drawings made to a reasonable scale, is so small, that to insist on a double competition, requiring both sketch and finished drawings, means simply twice the work and cost in comparison with the system the circular proposes to abolish, without bringing any corresponding benefit to the competitors. It would also open up every contest of the kind to two opportunities for the introduction of abuses to which competitions are liable."

In one sense, this is not a fair statement of the case. In saying that such a system would entail a double competition instead of a single one, the Leeds architects forget that only a selected number compete twice, and that the suggestion is that they should all be paid for their work. The system would, if adopted in the spirit in which the recommendation is framed, insure that only a small amount of work would be done by each competitor on mere chance. At the same time, we cannot but admit that practically, as far as the competitors selected for the second trial are concerned, it generally does mean something very like two sets of competition drawings for one competition, because no competitors who mean winning are ever content with mere sketches. Each devotes himself to producing as highly-finished a set of small drawings as possible, hoping by this means to cut out others who may not give themselves the trouble to make so good a show. This extra trouble, therefore, is in one sense entirely the fault of the architects, who will not be content with confining themselves to sketches properly so called, but elaborate their first sets of plans in the hope of thus securing attention. The only remedy for this must lie in the selection of judges or referees in whom the competitors would have confidence that they would consider the schemes on their intrinsic merits, without reference to the advantages they might any of them gain from show-drawing. It is impossible to define what a sketch is, and to throw out everything that oversteps that definition; nor perhaps have any two architects precisely the same idea as to what degree of work they would embody in a set of "sketch-plans." If it were understood that in the preliminary competition the selection would be influenced solely by the superior fitness of the plan, and the evidence of power in architectural treatment, furnished by the sketches, quite independent of mere finish of draughtsmanship, competitors would see the absurdity of throwing away work on elaborating their plans, and confine themselves to what was actually asked for of them. But then no one ever is sure of this; there is always the feeling that rough drawings will be behind in the running, consequently every one sends highly-finished ones. So long as architects will do this, we can only point out in extenuation of

the Leeds objections, that the repetition of work in the second competition may be reduced to a smaller amount than it usually is, by limiting the number of architects invited into the second competition. As a general rule, more are invited than need be, and thus unnecessary waste of labour is produced. In most cases any competent judge would be able to select out of the preliminary drawings three, or at most four, from among which the selection must certainly be made; and to invite more than these three or four to compete again, under the mistaken idea of doing justice to the best of the others, is only doing injustice, and encouraging people to waste their time. Let the referee, or the committee with his aid, select those sketch designs which they are really conscious that they would wish to see carried out, and they will not probably come to more than four at the outside, instead of the eight who are often invited to try again. Money will be saved on one side, and time and patience on the other.

One member of the Institute, Professor Kerr, appears to throw doubt upon the possibility of determining the real capacity of a competitor by his dealing with sketch plans on a small scale, and he instanced one case in which he asserted that sketch designs had been selected produced by authors who were not competent to be entrusted with the carrying out of an important building. This may, for all we know, have been so in the case referred to, but we do not admit that it need be so. From any fairly prepared set of sketches it is surely always possible to see whether a man has a grasp of the problem, whether he has a good idea of plan, and whether he has any power and originality in architectural treatment; and it is possible, therefore, to institute a comparison between different sketch designs in regard to these points. We regard the opposition of Professor Kerr and of the Leeds Architectural Society, therefore, as rather ill-timed, and as tending to throw difficulties unnecessarily in the way of what is really the best means of insuring a good result from a competition without demanding a great expenditure of time and labour on the mere chance of success. Professor Kerr, indeed, says that he knew a case where a man spent 200l. on the drawings for a sketch competition. He was, we should say, a very unwise person. The remedy for this will lie, however, in the general adoption of the system of securing the services of a professional adviser in selecting the plans, and in employing for that responsible office some one who will be known to be superior to being taken in by mere pretence of drawing, and who will look at the intrinsic merits of the sketches, whether they be rough or highly finished. As long as this is understood, we believe that the system of sketch competitions is one of the best means of doing justice to all parties. Occasions may be mentioned where it has failed; but, as a rule, its tendency is the other way.



## ON THE USE OF COMPASSES IN SCULPTURE.

It is not of the original triangular method of three points acting together adjusted by compasses, and travelling over the surface of the work, by means of which the forms of a model are transferred to a block of marble,—a method still partially in use in Italy,—that the following brief notes treat. Neither is it the preparatory employment of the compasses by the assistant for the attainment of the general dimensions of a work which they describe; but rather their use in the hands of the sculptor himself in aiding him, first in the clay model of his statue, and afterwards during its execution and completion in marble.

The saying is attributed to Michelangelo that "the best compasses are those of the eye." We cannot, however, construe this to imply that metrical precision is to be disregarded. Architect and engineer, as well as painter and sculptor, the great Florentine's training in science would forbid this interpretation. His remark may rather be accepted to indicate that in the higher branches of painting and sculpture mere mathematical accuracy does not go far enough in guidance; but that also a spiritual essence of proportion beyond that afforded by the use of the rule and compass is needed to inform the hand so as to carry the contours of poetic form to a higher point than mere exactness could reach,—the compasses of the eye thus bearing some such relation to the compasses of mere measurement as a Court of Equity to a Court of Common Law, as a subtler tribunal to consider refinements and enhancements which might slip through the coarser mesh of more literal judgment.

In discriminating the precept and practice of this great master, it must be acknowledged that his works, both of painting and sculpture, occasionally overstep the recognised relative proportions of nature: due, no doubt, to his overpowering sense of line and force. In some of his figures he does not shrink from modifying their proportions in order to attain increased swing and vigour; which fearlessness, among other examples, is to be seen in the recumbent and sedent figures of the tombs of the Medici, in their chapel in Florence.

No one, however, estimated higher, or praised more, the sculpture of the Greeks than did this artist; and with them it is evident that truth of dimension received great attention. Few ancient statues, perhaps, will bear the extreme of minute rigid measurement; but, on the other hand, none of the Greek works of repute which have been preserved to us indulge in such liberty of proportion as is to be traced in the sculpture of Buonarroti. That strict correspondence in the measurements and dimensions of the antique is subordinated to effect, and that departures from perfect accuracy with this view are to be discovered in many cases, is worthy of note; but scrutiny and consideration will generally furnish the student with a reason for each divergence, and show that it was not the result of carelessness or want of thought. All such deviations, however, to be acceptable, must exist within small limits. Thus these reflections lead us back again to the value of truth; although, without impropriety, it may be admitted that rules of proportion, while of great force, should yet be, in degree, elastic.

In several of the antique statues in standing positions it may be observed, in order to give increased sway and action and ease to the figure, that, in each case when it rests on one leg, the thigh of the other, which is pendent, is made somewhat longer than its true comparative measurement in reference to the other. This difference of length is indeed but a slight exaggeration of what takes place in nature, not, however, to the extent in which it is sometimes rendered in art. Joints, however firmly knit, are in degree apart, or they would not be free in play and movement. Thus, when they are pressed together at the hip and knee by the weight of the body thrown on them, they come slightly closer than when the limb is free and pendent. In many of the best examples of ancient art this difference is enhanced with the view of attaining thereby greater grace and variety of line.

A similar freedom is frequently to be discovered in the treatment of the lower leg from the knee to the ankle; and among the antiques in which this increase of length of the bent leg is to be noted are the Belvedere Apollo and his sister the Versailles Diana, in both which nobly

works the lower portion of the limb which is thrown back measures distinctly longer than the similar portion of the other on which the weight of the body is for the moment thrown. Plainly, however, this liberty is taken for a purpose, namely to increase the stride, and enhance the effect, of the advancing action. Nothing unnatural or forced, however, appears in contemplating these statues. The above diversities are to be detected only by the application of strict measurement. The impression of these great works is perfectly satisfactory; and nothing appears in variance with Nature, and one can but agree with the judiciousness of the treatment. Which result seems in harmony with the great master's eulogy of "the compasses of the eye."

To accumulate examples of these modifications of the measurements of corresponding parts in ancient sculpture would be superfluous, for the attention of the student being called to the subject he will search them out for himself, and weigh their advantages and disadvantages. He may, however, arrive at the conclusion that a certain elastic allowance and moderate liberty of variation being accepted for the sake of effect, the more nearly accuracy of measurement is complied with, the safer is the result, as it affords that satisfaction which is the attribute of truth alone. Thus in the practice of sculpture, both in the preparation of the model in clay and in plaster, and in rendering it into marble, the compasses or calipers frequently in the hands of the sculptor may be relied on, not as superseding the guidance of the eye, but as its faithful mentor.

In respect, however, to the use of these appliances at the very commencement of a work there may be two opinions. It may seem, indeed, scarcely consistent with the first stage of inspiration. The compasses have no direct power of suggestion. No poet or artist relies on rule for the first bud of an idea, or for the first sketch of a composition. Indeed, so early a reference to it might even, in either case, tend to check the spirit of a work of imagination. Thus in a statue it may best conduce to its ultimate success to leave free its first inception; and that it should be initiated apart from the fetters of measurement, except in as far as they may be indispensable in adjusting that interior rude framework which is requisite for the support of clay models, and thus not until the motive and action have been secured, that the compasses and calipers should be called in to rectify errors of dimension, which, although not manifest in the earlier stages of a model, become painfully so as it approaches completion.

This rectification is also the more desirable because additional errors are apt to creep in with the progress of the work; during which, unwittingly, the artist in the prosecution of his idea becomes purblind to inaccuracies, and may wander away from truth even farther than in his first steps. This remark may appear fanciful and overstrained to those not conversant with the adventures, perils, and complications attending art production, but will, nevertheless, find ready recognition from those familiar with it.

In the process of modelling a statue there is, as it advances, not unfrequently, a proneness towards, according as it may happen, making the bent limb thicker than the straight one, or vice versa; and this has to be guarded against. It is within the experience of most sculptors that the diverse actions of limbs are apt to induce unduly unequal sizes in parts which, notwithstanding their difference of position, should correspond in length and mass. This kind of error, which is a besetting infirmity with some artists, finds its best remedy, not only in reference to Nature, but also in the use of compasses.

Even in the most refined and poetic statues this will be found to be no hindrance; but, on the contrary, superior beauty is likely to be the gratifying result of this care for truth, inasmuch as the most beautiful proportion of parts will probably lie between these two extremes of dimension; and thus the duplicate nature of the human form will, by means of the rectifying power of comparative measurement, come into the service of art in its search for elegance and refinement.

Within the mission of measurement is also, not only the keeping the dimensions of corresponding parts similar, but also the regulation of their differences. Thus, when the torso of a figure is bent at the waist to one side, it will be somewhat broader and thicker on the bent side

than on that which is stretched, because it is less in length, and the corresponding mass has to be differently accommodated. A similar modification applies to the flexure of the limbs, which are altered in thickness by change of action; for as the muscles contract in length, they increase in thickness. This is readily tested by the hand on the biceps muscle of the arm, as that member is extended or drawn up; and the same remark applies also to the lower limbs. Even in the fingers and toes, although these are chiefly tendinous rather than muscular, analogous modifications of dimension take place as they are extended or contracted.

The bones, however, which form the framework on which all the body is constructed and supported, do not change in length by variety of position, and thus, in respect to lengths, it is safest to measure from end to end of the bones than from the prominences of the flesh. For instance, in respect to the arm in different actions: when it is bent, and in proportion as it is more bent, the distance from the top of the shoulder to the elbow increases, because the point of the elbow is at one end of one of the two bones of the lower arm, which point projects a little beyond its jointing with the lower end of the bone of the upper arm at the elbow. From this cause, when the arm is bent up, this projection goes down, and this makes the measurement from it to the top of the shoulder in this action distinctly more than when the arm is straightened, and when, consequently, this point goes up. And this change also, is readily recognised by the hand during the alteration of the action of the arm, and the degree to which this takes place is a subject for the employment of compasses.

On the other hand, the length from the point of the elbow to the under wrist-bone remains in all actions the same, as they are but the two opposite ends of the same bone, the *ulna*; and it may be noted as a convenient comparative measurement in a statue, that this bone, in well-proportioned form, is usually of the same length as the foot, namely, that from the elbow to the wrist-bone is the same length as from the tip of the longest toe to the heel.

A variation of a similar nature to that which takes place in the measurement from the point of the elbow to the top of the shoulder in proportion as the arm is bent or extended, is to be observed in the distance from the back of the knee-joint to the point of the heel according as the foot is drawn up or pointed down; only to a degree greater in proportion as the projection of the heel is greater than that of the point of the elbow. Thus in comparative measurement it is preferable to measure from the knee to the ankle-bone, rather than to the heel, nor should such measurement, to be reliable, be taken from the patella or knee-cap, for that is the movable bone, but from the upper end of the tibia by its side, to either ankle. Thus, in considering the different parts of the human frame, it may be recognised that the aid of compasses is equally to the purpose in adjusting appropriate differences of dimension as in insuring just uniformity in parts which should be in duplicate.

In regard to the more loosely-playing bones, as the knee-cap above mentioned, and the larger bones of the clavicles and shoulder-blades, measurements have to be made from them with cautious allowance and some latitude, as they do not yield such simple and definite items for this purpose as the more closely-knit parts of the bony structure.

The above considerations in respect to divergence from uniformity under change of position in portions of the general form otherwise in correspondence, also apply to some changes which take place in the face. In theory we may accept that the human face, if viewed exactly in front, and without the head being turned either towards the right or the left, may have its form and features precisely, to use the artistic term, "in drawing"; that is, exactly corresponding in measurement in all respects, although such perfect parity is rarely to be found in nature. Nevertheless let it be granted, when the head is exactly upright and straight on the shoulders and not turned in any degree to the right or left, that it might be so represented without detriment to its look of natural ease. Nevertheless, on the other hand, immediately the head is turned even slightly either way this perfect correspondence of sides vanishes, which change must be taken account of in representing it in art or an unnatural stiffness of appearance will be the result.

Were it possible that the intelligent and



lively features of the human face were composed of some rigid material, this change could not take place, but, constituted as the visage is of pliable and elastic flesh, it is motive, not only by expression, but by alteration of position, to which at once it adapts itself. Whenever, therefore, the head is turned on the neck to either side a similar amount of substance of cheek and features has to be accommodated on that side within a diminished space as has to be extended on the other side to an increased one; so that a distinct difference between the two sides of the face is the result, and not only does this affect the form of the cheeks, but also of the mouth, causing the two sides to vary; and this modification of form extends in a lesser degree, even to the wings of the nose and the lower surroundings of the eyes, inasmuch that the whole contour of the two sides of the face is thrown out of parity; and if this be not allowed for in art, especially in sculpture, a want of appearance of life and ease will be the consequence.

The attention which these details of Nature received from the sculptors of classic days may be recognised by the eye, and tested by compasses; and in the familiar examples of the Apollo Belvedere and the Medicean Venus, in both of which statues, the heads being turned on one side, the contours of the two sides of the face are modified accordingly. It is not necessary to multiply instances, but similar considerations have more or less guided the treatment of all the finest antique statues and busts.

The above remarks, although possibly they may have some interest with the general reader as noting facts of Nature which lie out of the path of usual observation, are, as matters of actual measurement, addressed to the student of sculpture, their subject forming part of those considerations which enter into his province to investigate and act on: not only in the preparation of the clay model, but afterwards in the completion and refinement of his statue in marble, which it is his legitimate dream of hope that it may last for ages.

In the higher poetic and epic class of sculpture, it may be taken for granted that the sculptor's devotion to his art will not allow the last stages of his marble statue to be the work solely of his assistants, but that he will himself also take a large part in the actual manual workmanship of it in a sincere and loving spirit. In his finishing of his creation, the compasses are faithful critics, and should be ever close at hand to render advice as his tools execute. Such care can have no disadvantages; but, on the contrary, will conduce not only to the reasonableness and truth of his work, but also to its beauty and excellence.

Precision of measurement will not, by itself, make a fine statue; but, at the same time, it is a safe axiom that a fine statue can scarcely exist with any great divergence from it. Mere exactitude will not ensure beauty; but wide departures from it are open to great doubt; and it is evident that, while no exception can be taken to scrupulous accuracy, perceptible deviation invites objection. The literal precision of a mechanical lay-figure will not achieve the harmonious proportions of a beautiful statue, but if a modification of measurement be pleaded for in certain cases it should, at least, be for some evident and sufficient reason and well-advised purpose.

In the above observations no mention has been made of the recognised proportional measurements of 7, 7½, or 8 heads for the whole height of the figure; nor of various other serviceable details of the ratios of classic form. These are fully afforded by Vitruvius, Leonardo da Vinci, Flaxman, Gibson, Bonomi, and other honoured authorities, and are accepted and in use by all sculptors. The limited province of the foregoing notes has not been dissertation on these well-founded theories, which would have been superfluous, but has been confined to some consideration of the practice of measurement by the eye and compasses in furtherance of their application to the process of sculpture; principally by comparison of the changes made in corresponding parts by difference of action. Such as they are, these remarks are not the offspring of speculation, but the result of many years of handicraft with the modelling tool and chisel.

At the Royal Institution on Friday, the 24th ult., Mr. Chubb exhibited, in action and explained, the new patent electric time-lock, a very marvellous yet simple piece of mechanism.

## RIVER CONSERVANCY AND PROTECTION FROM FLOOD.

THE "BUILDER" AND THE INSTITUTION OF CIVIL ENGINEERS.

An influential deputation, consisting of representatives of many of the largest towns in the country, and including eight members of the House of Commons, had an interview, on the 22nd of March, with Mr. Dodson, at the Office of the Board of Trade, in order to urge on the Government the importance of legislation with regard to the conservancy of our rivers. Mr. Dodson explained that it was only by full discussion in Parliament that the imperfections of the Bill now before the House could be explained or remedied, and that "it was impossible to grapple with these different points until they got into Committee."

At the very time when the deputation was thus engaged, a little pamphlet on the Conservancy of Rivers had just been issued, in anticipation of the Quarterly Volume of the Minutes of Proceedings of the Institution of Civil Engineers, which certainly throws more light on the main questions of River Conservancy than any other work in the language with which we are acquainted. It would have been of no small utility, on the one hand, to Mr. Peel and the members of the deputation, and on the other hand to Mr. Dodson, and the members of the Cabinet, to have read this pamphlet with attention.

To none will the contents of the little book have more interest than to the constant readers of the *Builder*, for they will have the satisfaction of seeing those great primary principles, of the importance of which we were for so long the only exponents in the press, fully accepted and admitted by what may be called our only jury of experts. The little pamphlet contains (1), a paper on the rivers of the Eastern Midland district of England, by Mr. W. H. Wheeler; and (2), one on the valley of the Irwell, by Mr. A. Jacob. To these papers, special in their application, we need not further refer. But the debate which ensued upon the reading, and which occupied the greater part of two evenings, has unusual value. Some thirty engineers, familiar with river hydraulics, including one Italian, one German, and three Frenchmen of eminence, took part in this debate. The subject was thus approached from the point of view illustrated by foreign experience, as well as by home practice, or want of practice. The speakers, however, were unanimous in their declaration of the cardinal importance of the principles which we have so long enunciated. No meddling with a river can be expected to be of any utility unless under two conditions:—(1), the whole watershed district must be under the control of one supreme authority; and (2), a hydrographic survey of such watershed district is an indispensable preliminary to any useful work within its boundary.

The general outcome of the debate, further, was to the effect that any more permissive Bill must run a great risk of aggravating existing evils. Mr. Rawlinson said that the various Acts of Parliament in existence relating to rivers, canals, harbours, and docks numbered about 4,000. Mr. Abernethy said that the great defect in our river management was due to divided jurisdiction. General boards, composed of men selected, irrespective of local influence, and having control, not only over rivers, but over their affluents, appeared to his experience demanded by the necessity of the case. Mr. Dawbarn "had arrived at the conviction that the difficulties connected with the removal of the evils of flooding were not so much engineering difficulties as difficulties arising from the want of legislative facility for constituting right governments over the rivers. In many districts the proper course had been known for years." The Nene is a case in point. Mr. Giles, confirming Mr. J. C. Hawkshaw, cited the case of seventeen boards of control existing in a small district about Lincoln. Mr. Martin pointed out that the provisions of the Government Bill would lead to "a state of things similar to that which had been described as so injurious on the Witham and Fen districts, namely, a multiplicity of conservancy authorities and districts, each having jurisdiction over a part only of the river basin, each more or less jealous of its neighbour; without cohesion, and without knowledge of, or consideration for, the general interests of the river basin considered as a whole." Mr. J. W. Barry said that "on the river Hull there were no less than five drainage

districts, a navigation commission, a court of sewers, and a corporation, all claiming jurisdiction in some way over the river. The result of the conflict of authority was, that nothing was ever done to the river; it was never cleaned out; it was never regulated; weeds were allowed to grow; and people were allowed to put obstructions in it. At a distance of only two miles and a half from the mouth of the Humber, the low-water line of spring tides was 15 ft. higher than in the Humber itself, and at a distance of one mile from the mouth it was 9 ft. higher; and nothing was done to improve the river." Mr. Bateman said that "the conditions of riparian owners,—those who lived on the high lands, and those on the low lands,—were so various and antagonistic one to the other that it would be exceedingly difficult to bring any river basin into such a condition that all parties would agree to the adoption of a particular system by which the floods might be reduced."

So unanimous and unhesitating a consent as to the truth of the great principles on which we have so long insisted, renders it unnecessary to say more on this point. The difficulty of dealing with our rivers is not an engineering difficulty; it simply arises from want of unity of system and unity of control. We are thus led to say a word as to that vexed part of the subject on which we have hitherto been silent, viz., the area of land rateable to the cost of river improvement. As to this we have said nothing, from the wish first to obtain an assent,—such as is now accorded by the Institution of Civil Engineers,—to the first principles we laid down. But now this question of rating comes to the fore. Not only so, it is probable that it is on this that the fight will take place, and that, in all probability, the opposition to any truly efficient Bill will be successful.

As to this, then, we think it can hardly be denied that to attempt a general determination of the principle of rating as a preliminary part of reform is to put the cart before the horse. The conditions of the various river districts vary so widely that what would be a fair distribution of rating in one case would be manifestly unjust in another. Each watershed has not only to be engineered, but to be rated, on principles appropriate to itself. The first thing then needful, as we have all along said, is the survey. With the survey of a district in hand, any competent engineer would be able at once to point out the proper rate of incidence of the cost of conservancy as divided between upland, midland, and marshland. Without such a survey, no one can attempt to indicate the proportion with any justice. But as the cost of the survey is a part of the cost of the conservancy, there will be here a vicious circle, unless the State steps in, and in the first instance undertakes the cost and responsibility of the necessary surveys (which, in fact, are only extensions of the Ordnance map into proper detail), the cost being either borne by the nation, or refunded by the locality hereafter, as Parliament may decide.

Thus again, by another but a natural road, we come back to the fact that an adequate hydrographic survey of each river district is a necessary preliminary to any wise legislation, not only as regards the work to be executed for the conservancy of the river in question, but also as regards the consideration of the rateable proportions in which the lands lying at different levels lying within that area should contribute to effect their common advantage and safety. It is worse than waste of time to debate how a thing should be done before we know what it is that we ought to do.

## THE FRENCH AND FLEMISH EXHIBITION.

THE twenty-ninth annual exhibition at the French and Flemish Gallery opened this week. Two of the prominent places are occupied by works by Professor Müller, one of which, "An Almée's Admirers" (62), shows this remarkable and powerful painter at his best. This painting represents a group of Arabs regarding with what may be called "stolid interest," if such a contradiction in terms be admissible, the dancing of a woman in the centre of the group. The painting is one of uncompromising realism, in one sense; no attempt is made to render graceful even the dancer, who is thick-waisted and unattractive, and the figures who regard her are sinister and cadaverous; but an



air of high art is thrown over the whole by the breadth of style and the forcible treatment of light throughout. The dancer is inspired by the sounds of two outlandish-looking instruments of the fiddle tribe, played by two musicians crouched on the ground. Herr Müller's other work, "An Arab Home" (17), might pass as an illustration of the proverb,—"Home is home, be it never so homely." It is certainly very homely in this case; but here again the style is the redeeming quality, and gives high interest to a mean and squalid subject. The other two centre pictures present a curious contrast. One is a mystical work, "The Annunciation" (115), in which a Syrian girl, of very sweet features, beautifully painted, kneels on a house-top with a bridal veil floating behind her, and receives the message from a watery-looking and figureless angel who floats in the air before her. The kneeling woman is as figureless as the angel; the one point in the picture is her face. The fourth work alluded to is one of M. Bastien-Lepage's big pieces of realism, "Un Mendiant" (159), a large canvas whereon is represented a sturdy beggar in the act of pocketing the dole given him from a cottage, from the half-closed door of which a little child is looking on the beggar with a sweet face of interest and compassion, beautifully painted, it does not seem to merit very much. The rest of the canvas—a large square one,—is taken up with the wall and the white window-shutters of the house, and other uninteresting details, enclosed in a very elaborate frame covered with realistic foliage in relief, and apparently designed expressly for the painting. The work is, in fact, a magnified genre picture, and as such occupies more wall space than its intellectual interest is worth, and might as well have been painted on a much smaller scale with equal and, perhaps, better effect.

Among the best contributions to the collection are those by Herr Anker. In his two principal works, "Physic without Faculty" (9), and "His Custom of an Afternoon" (90), we are struck by the fine feeling for colour displayed, and also by the great attention given to the composition of the groups, a matter which, in the over-tendency to realism in the present day, is often much neglected. The group on the right, in the first-named work, formed by the mother and two children, falls into a complete harmony of lines, evidently carefully studied, and yet having the effect of spontaneous impulse. The same harmony and repose of line are seen even more completely in No. 90, where an old man dozes in an armchair with a child on his knee; the repose of the whole is perfect. If the colour in this be compared with that in Kauffmann's "A Disciple of Paganini" (87), it will be observed how it is possible to make out of the dingy garments of poverty something pleasanter and richer in colour effect than the cold dingy browns which are constantly repeated by Herr Kauffmann and other painters of the same school. The value of composition is negatively illustrated, again, in the child subjects of M. Dargelas (22, 50), in which the figures are dotted over the canvas in a jagged manner which is uncomfortable to the eye; they have sufficient relation to each other in their actions, but they do not group happily.

Among other things there is a beautiful little bit, by Israels, "The Evening of Life" (146), which is just a title for a small interior with a figure. "The End of the Day," by Jules Breton (25), is not a first-class specimen of the painter, it is not very good in colour, though the heads are expressive; "The Gleaners," by Lugué (166), is a more successful work of the same class, in which it must be admitted, however, that the inspiration is drawn from Breton. There is a capital figure in Capobianchi's "Le Tir à la Cible" (3), that of the lad holding the bow, in a picture otherwise rather feeble and not very harmonious in colour; it is a Pompeian interior. "A Musical Jury,—Eighteenth Century" (41), by L. Jimenez, is another study of a special period, very clever in some of the heads, but painted in the hard spotty manner which has been adopted by this artist: the screen behind the jury, by the way, is out of perspective. "At Tréport" (151), by E. Van Marcke, shows fine painting of horses, cattle, and boats in a pleasing manner of the best qualities of Cuvp. with more power and breadth of manner.

"Tide coming in, Boulogne" (61), by Th. Weber, is a work which might suggest questions to some of our sea-painters as to the tone of the sea. We have here the same kind of fall and

loaded painting of water which is so effective in the hands of at least one distinguished English sea-painter, but we have it accompanied by tones which certainly are nearer the actual realistic tone of sea water breaking on sand than what is sometimes offered to us as such in our own exhibitions. The interest of landscape is specially centred this year in the works of O. Heffner, who has several paintings in the principal rooms, and a collection of studies upstairs. Of the finished paintings much the finest is "On the Banks of Lake Starnberg" (49), an expanse of shallow water under a bright sky, bordered by flat country, the perspective extent of which is beautifully made out. The other large work, "The Last Glint before the Gloaming" (82), is less successful, the left-hand portion at least of the painting is hard and toneless. Among the studies upstairs many impress us with the same quality of hardness, though there is very forcible and brilliant work among them. One of the finest in colour and texture, a small view of the "Thames at Maidenhead," left a curious impression of topographical inaccuracy, the Thames being made to appear like a straight canal. Among other landscapes are the usual snow pictures of Manthe, a fine broadly-painted "View near Stockholm" (48), by W. de Gegerfelt, "Forest Labour," by E. Hallstén (16), "A Norwegian Lake" (114), by A. Wahlberg; and in a retired corner an exquisite "Idyll," by Corot (31), gives a glimpse of the romance of landscape-painting, the work of an artist who literally gave us poetry measurable by the square foot.

#### THE MUNICIPAL GOVERNMENT OF PARIS.\*

THE management of the highways and the byways of the city forms, it can be understood, an important part of the duties of the Paris Municipal Council, comprising the paving, macadamising, and asphaltting of the side walks and roads, the piercing of new and the levelling of old thoroughfares, their sweeping, watering, and lighting, and the due regulation of the various vehicles that circulate in the city. In 1877 something like 6,000,000 of square metres or yards superficial were paved in Paris, and some 2,000,000 macadamised, the French macadamised roads not differing much from our own except that they are, as a rule, broader. For the side walks, those paved with granite, the city refunds to the householders a third of their expense, but only a sixth for asphalt pavements, but, once laid down, the city undertakes their maintenance. In a former article reference was made to the *voies* of Paris: under this head are included a large number of important municipal matters. These may be mentioned as follow: the creation of new thoroughfares and their plan; the purchase and sale of property, and the drawing up of estimates; according concessions and permission for building; and the supervision of all new erections, the maintenance in healthy condition of all houses, examinations of encroachments on thoroughfares, the numbering of dwellings, and the inspection of the quarters which undermine Paris. It will be seen that in many points the French system resembles our own. The builder of every house has to consult before commencing work the municipal plans, and all encroachments have to be duly authorised; the height of buildings is not allowed to exceed 20 mètres (65 ft. 6 in.),† the superficies of all interior courtyards is regulated by law. Wooden constructions are authorised in exceptional cases alone, and the establishment of all privies and closets is submitted to the severest administrative rules. The administration has it always in its power to inspect all old houses and to oblige the owner to execute any necessary repairs, or even close a house; the privies can only be opened to be emptied and shut, after a visit of a special municipal officer; unhealthy dwellings can be closed if incapable of being rendered habitable. The façades of all the houses have to be cleaned once every ten years.

The maintenance of the public thoroughfares figures on the budget of 1879 for some 7,500,000 francs (300,000*l.*), to which must be added hard upon another 1,000,000 francs, for new pavements, 1,500,000 francs for the maintenance of the side-walks, which, with the 500,000

francs paid to the *employés*, brings the total up to about 10,500,000 francs (420,000*l.*), a sum a third of which is paid by the State, and in a small proportion by the gas and water companies. Admirably as Paris may be said to be now paved, there still exist many streets but ill-paved and lighted, a fault which lies literally at the doors of the owners of the houses, unable to pay the necessary expenses. The city, however, gives ample facilities for payment by instalments, and in time we may expect the streets of the whole capital to be in the same admirable order as its leading thoroughfares.

The watering, sweeping, cleaning, and removal of refuse from the streets is the duty of a special set of men and women (not the broken-down gangs of workhouse pensioners used in England), most of whom work for half a day, that is, from three or four o'clock in the morning (according to the season) till ten, the streets being very properly swept every morning before the mass of people are out of bed. The *personnel* counts some 8,120 men and women, these latter excellent workers; they receive 1 franc 20 centimes; the men 1 franc 50 centimes to 1 franc 75 centimes, recently augmented by 2 centimes an hour. The road-menders are paid by the month,—105 francs to 110 francs the foremen, 86 francs to 90 francs the men; 5 francs being kept back for the savings-banks and 2 francs for the retiring pension.

The Paris streets are largely watered by means of a movable hose which screws on to the fire-plugs, some 2½ millions of square yards being thus watered, it being found to cost half less than with the watering-carts, of which some 350 are employed, and water a surface of some 6,000,000 square yards. How is it, it may be asked, that we have not yet introduced the use of the hose? The removal of the dust, again, is one of those excellently organised systems we may well envy our neighbours. Each day the dust-cart calls, before nine o'clock,—such a barbarity as a dust-hole is unknown in Paris,—and the house refuse is removed; the work is confided by tender to a dozen or so contractors, the expense to the Municipality being about 700,000 francs (28,000*l.*). The sweeping and watering cost 5,500,000 francs (220,000*l.*), a large number of poor and deserving people being employed, who faithfully perform the duties so ill-executed in our capital, where dirt lies for days, and pieces of unsightly paper strew every thoroughfare.

Paris, once one of the worst lighted cities in the world, is now admirably supplied with gas and electric lamps. Our space does not allow of any historical survey of the advances made; one or two dates will amply suffice. In 1774, 800 lanterns were ordered to be lighted; six years later, 2,200; in 1797, 4,112; it was not till 1824 that gas made its appearance in Paris (Pall-mall was lighted with gas as far back as 1807, so Cunningham tells us). There are now some 40,000 to 50,000 lamps in the city, the expense being calculated at hard on 6,000,000 francs (240,000*l.*), but Londoners would grumble sadly at the amount which Parisians have to pay for their gas bill. Monopoly rules triumphantly, though electricity promises now to somewhat re-establish matters.

As eminently connected with the public thoroughfares, a few words may be devoted to the omnibuses of Paris. The company enjoys a monopoly, but under certain conditions. One of these is noteworthy. In case of frost, the company is called upon to furnish the city for the removal of snow and ice, and to strew sand, so necessary with asphalted roads, fifty carts a day, each with two horses and a driver; and since the introduction of steam fire-engines, the omnibus company furnishes for 4,000*l.* annually, the horses, harness, and drivers necessary in cases of emergency. By the terms of the agreement, the invariable price within the city walls of all omnibuses is fixed at 15 centimes (less than threehalfpence) for the outside places, and at 30 centimes for the interior. This is not the place to describe the organisation of the omnibus company; suffice it to say that we Londoners may well envy the Parisians the cheapness, regularity, and rapidity of their omnibus service, its well-arranged and numerous waiting-rooms, the politeness of the conductors, and the comfort especially of the more newly-constructed carriages.

In the matter of taxes on the entry of provisions, Paris stands behind London, though, let it be remarked, it is alone by these levies that so many of the expenses are paid; but in the matter of providing markets for the distrib-

\* See *Builder*, p. 212, ante.

† By the law of 1872, the height of the houses in a street is regulated by its width, as also the slope of the roof.



bution of food, Paris takes the lead, perhaps, of all cities in the world. In addition to its famous *Halles Centrales*, each neighbourhood is supplied with a market, an ample diminutive copy of the great central market; in no way more wisely than this has the city of Paris expended during past years its many millions of francs. London would be spared much of the inconvenience of street cries, the public would be better served, the burden of trade lessened, could district markets be more liberally supplied. In return for the millions of francs,—some five millions sterling,—which the city receives from its town dues, a careful inspection is exercised, and fraud and adulteration strictly watched. The erection of new and the enlargement of old markets, and innumerable minor matters, entail a large yearly expenditure. The *Entrepôt de Bercy*, the great bonded warehouses for wine, will shortly be entirely rebuilt at an immense expense; the *abattoirs*, or slaughter-houses, of La Villette, together with the erection of the *Halles Centrales*, involved, it can be imagined, an enormous outlay, but the expense was justified perhaps more than any other made by the city as a measure of public hygiene, and from the services these great works rendered in providing the capital with an ample supply of the first necessities of existence.

The Charity Organisation of Paris (*Assistance Publique*) is, as can be supposed, an important item in the municipal budget. While the task of the present day is eminently to facilitate work, to encourage thrift, and prepare the coming generation by a good general and technical education, there is a sad amount of misery to assist, and the municipality of Paris is no less generous in the work of charity than our own great corporations. There are members of the council who have even wished that less might be expended on beautifying the capital, and not only that more be devoted to the assistance of the poor, but that this assistance be of a more intelligent character. It is a task beyond our power to summarise the various points of the charity organisation of the Paris municipality; the question finds itself, unfortunately for our neighbours, complicated to a great extent by religious difficulties, it being urged that the whole matter should be placed solely in lay hands. The traditions of the past are struggling hotly with the reforms and facts of the present; and there is justice in the complaint that while the superb establishments for the relief of the poor which are shown to the stranger astonish him, the fact none the less remains that out of a population of two millions the number of relieved poor is over 113,000. A million sterling figures on the budget for charity, half of which the Paris municipality have to pay, and yet this sum is miserably insufficient for the purpose, while its distribution shows, on inquiry, sad abuses, the butt of endless attacks and complaints on the part of the public, and in the Municipal Council itself.

The expenses connected with education amount in the Paris budget to some 12,000,000 of francs, hard on half a million sterling, a large number of scholarships being accorded in the municipal "Collège Rollin," and in the other schools scattered over the city; this sum is wisely divided between the different schools of design and decorative art, the apprentices' schools, travelling expenses during the holidays for prize boys, for gratuitous education, savings-banks, &c.; the income being only 2,500,000 francs, the expense to the city is yearly hard on 9,500,000 francs. Awaiting the day when instruction will be rendered obligatory in France, the Paris municipality is working hard in this direction; new schools are being opened in every direction, and the methods of instruction are constantly undergoing improvement, with a view to preparing serviceably the future generations. The great question of technical education has been approached, and a school on the Boulevard de la Villette has been founded, as also one in the Rue Tournefort. Talent is encouraged by bursaries and scholarships, holiday excursions for prize boys paid for by the municipality being an innovation that deserves mention. The infants' schools, the municipality admit, have not yet received their requisite development, but time will effect reforms. There remain to mention the fifty-three special schools of design, and twelve others for geometrical drawing which exist in Paris independently of the drawing lessons given in all the boys' and girls' schools, and the two "superior" schools, resembling the Government

School of Decorative Art in the Rue de l'École de Médecine which will shortly be, if they are not at present actually, established, one in the Place des Vosges, the other in the Rue aux Ours. Sewing and dressmaking lessons are given in the girls' schools; special schools of design are each year subsidised by the municipality. The women are not neglected, five book-keeping classes being at present open to them, and the Municipal Council subsidises a number of other professional schools for women; strange to say, schools of cookery are not known.

To those whom figures may interest, we may observe that the financial resources of Paris are numerous. In the first place come those most heavy and most unreasonable of all taxes the town-dues (*octroi*), which, falling principally on the food of the people, only await some substitute to be abolished for ever. Iniquitous as is this tax, weighing so particularly on the poor for their provisions, light, and heat, it produces an income to the municipality of over five millions sterling, a tax being levied on nearly everything that passes through the gates. In one year alone, that of 1877, the item of building materials brought 13 millions of francs (!) into the municipal exchequer. A million sterling (in the budget of 1879) is entered as accruing from impositions *spéciales*, which many Englishmen would indeed consider impositions, but which have cheerfully to be borne by the Parisians, who, for their gay capital, find they have the piper to pay. The water company pays 400,000*l.* to the municipality; the gas company, 340,000*l.*; the markets bring in 280,000*l.*; rates from the *voirie* department, 240,000*l.*; 180,000*l.* are taken from the rent of cab-ranks, &c.; 120,000*l.* from the slaughter-houses; sweeping rates, 100,000*l.*; from the schools another 100,000*l.*; from the rent for sheds in the bonded warehouses, 80,000*l.*; from the cemeteries, 80,000*l.*; from the utilisation of the sewage, 60,000*l.*; from the various municipal properties, 50,000*l.*; the Bois de Boulogne, with its wonderful lakes, ice-houses, cafés, restaurants, villas, pasturage, &c., brings in alone the little item of 160,000 francs (6,400*l.*); the circuses, theatres, restaurants, panoramas, café-concerts, and Palais de l'Industrie, in the Champs Élysées, no less than 134,000 francs (5,360*l.*); divers receipts enter for 40,000*l.*; the rent from kiosks, advertising-columns, letting of chairs on the boulevards, and in the parks, 80,000*l.*, not a small portion of which is paid for by the *cafés* on the great boulevards for the right to cover a portion of the broad pavement with the little tables which give to the streets of Paris so characteristic an appearance; from burial fees, 34,000*l.*; from gun licences and fines, 25,000*l.*; permission for building, 24,000*l.*; from public weights and measures, 14,000*l.*; stamp taxes, 10,000*l.*; sale of old building materials, 8,000*l.*; and last on the list, according to the budget of 1879 from legacies and other private sources, 6,769 francs, or little over 270*l.*, a humiliating sum for so large a city as Paris, but this is one of the features of the principle adopted by the municipality of Paris; the private charity which is exercised so generously in England, is left by the public in France to the State or the Municipal Government.

Against the receipts the expenses have to be placed, and they are large; we have mentioned most of the principal items in the course of our paper, the total amounts to hard on 8,000,000*l.* sterling. Such, hastily sketched out, is the working of the Paris municipality.

#### INSPECTORS OF NUISANCES.\*

A NEW profession, or calling, came into the world ten years ago. There was no long struggle before it was generally acknowledged; for it was ushered into existence with all the pomp and circumstance of an Act of Parliament, and at once enjoyed the widest official and scientific consideration. This new vocation is the profession of sanitary inspection. As our readers are aware, the Public Health Act of 1872 divided England and Wales into sanitary districts, and required the appointment of a staff of officers in each of them, including an inspector of nuisances, and straightway every mile of country was placed under the surveillance of these new guardians. In time to come sanitary knowledge will be sufficiently consolidated

to permit of public competitive examinations for the numerous posts thus created. At present, however, this new profession is open to all comers, and the post is not always properly filled.

From Plantagenet times there has always been an effort to assist in the preservation of the public health by legislation. In those remote days, unfortunately, the sources of disease were but little known; consequently, though some measures were taken, they were few and feeble. A condemnation of mangled pork was one of the earliest sanitary enactments. Edward II. decreed that any butcher who sold swine's flesh mangled should be fined for the first offence, pilloried for the second, imprisoned and fined for the third, and expelled from the town for the fourth. Richard II. took early notice of nuisances in the form of filth cast into ditches or rivers, or in any place near a city, borough, or town. He decreed that any one casting garbage anywhere to the annoyance of other people should be called by writ before the Chancellor, and, if found guilty, be punished at his discretion. Henry VII. enacted that no butcher should kill in his slaughtering-house, or within a walled town, Cambridge, Carlisle, and Berwick excepted. The question of overcrowding was taken into account by Queen Elizabeth's ministers. A law was passed in the reign of that sovereign lady setting forth, "No owner or occupier of any cottage shall place or willingly suffer any more families than one to cohabit therein, in pain to forfeit to the Lord of the Let ten shillings for every month he so continues them together." The Great Plague caused many enactments to be made for the benefit of the public health in the matter of the prevention of the spreading of infection; and the Great Fire was the cause of various regulations respecting the laying-out of London streets and lanes, the sewerage, drainage, and building of houses upon a better sanitary basis. Later on, in the reign of James I., search was authorised to be made in shops, cellars, warehouses, and any other suspected places for spices and drugs ungarbled. There were regulations made for bakehouses; and, as years passed by, sanitary measures were more frequently considered and more vigorously undertaken.

Early in this century town after town obtained an Improvement Act; and in 1848 a Public Health Act was passed that applied to all England and Wales. This was succeeded rapidly and successively by a Common Lodging-house Act, the Diseases Prevention Act, the Removal of Nuisances Act, the Local Government Act, a Bakehouse Regulation Act, the Sanitary Act, a Workshop Regulation Act, the Artisans' and Labourers' Dwellings Act, an Act to amend the Law for the Prevention of Adulteration of Food and Drink and of Drugs; and the complication was still further increased by the Public Health Act of 1872, mentioned above. Eventually an Act was framed in which every question concerning the preservation of the health of the inhabitants of England and Wales was considered and consolidated, and the former Acts were repealed, with the exception of a few sections. It is this comprehensive Public Health Act of 1875 upon which the inspector bases his operations.

The sanitary matters coming under the care of these new guardians of the public health are of a varied nature. The sewerage and drainage of houses and streets occupy a foremost place. A vigorous look-out for all offensive collections, including accumulations in ditches and manure-heaps, forms a second branch of the subject. The superintendence and organisation of the scavenging and cleansing of streets, alleys, courts, and roads, is a third duty. An intelligent and constant attention to the water supply is a fourth. A frequent inspection of common lodging-houses and cellars, to see that all the regulations made to maintain a decent and sanitary condition of things in them are conformed with, is a fifth duty. The examination of houses unfit for human habitation as a preliminary to their condemnation, is a sixth variety of duty. Infectious diseases and the disinfection of houses, clothing, and bedding, give rise to quite another line of action. A surveillance of factories and workshops, the management of slaughter-houses, the inspection of food exposed or offered for sale, are further duties the inspector is called upon to perform. To preside over all these matters in a district more or less large requires a considerable amount of resource and method, and a general acquaintance with all sanitary knowledge, old

\* A Practical Guide for Inspectors of Nuisances. By F. R. Wilson. London: Knight & Co., 90, Fleet-street, 1881.



and new. Every district is permitted to make its own by-laws for its own regulation; consequently, looking from one part of the country to another, there is to be noticed, here and there, a startling elasticity of opinion as to what constitute rigid sanitary requirements. Nevertheless, it is certain the general stock of information thus acted upon is gradually shaping itself into an agency for good. More exactness will bring more stringent limits into these by-laws; for the present, the indefiniteness thus admitted must be passed over.

The inspector, in effect, takes up a position similar to that formerly occupied by the guard at the gates of a town. He has to see that nothing comes into his district that can militate against the health of the residents with as much vigilance as was exercised by the guard in the days of old to ensure the personal safety of the inhabitants. In addition, he has to see the earth is not cumbered with filth in improper places; that the air is kept pure by the removal of all noisome accumulations, unnecessary smoke and exhalations; and the water kept free from all contamination, either from infiltration, sewer gases, indoors or out, or defilement by noxious discharges, or cattle, or mischievous persons. Fresh air and pure water have been considered of the foremost consequence; but, recently, a conviction has been pressed forward that the nature and condition of the spot of earth we live upon, and its surroundings, are matters of great moment. Particulars have been gathered together which tend to show the soil has its influence on the food produced on it; the food has its influence on the health of those who partake of it; and height and bulk of individuals depend in great measure upon the conditions thus produced. Again, a soil that retains the rainfall has been found so frequently in situations where diphtheria has raged that investigators are beginning to take for granted it is one of the causes of this visitation. A decrease of consumption has been found to result from drainage; and much good is expected to arise from a more complete and extended system. It may be asked what control an inspector can exercise on soil. Here the efficacy of law, or by-laws, comes in. Subject to the approval of the Local Government Board, an authority can issue regulations requiring the drainage of all sites used for buildings and streets, a perfect system of sewerage, damp-proof courses to all new houses, and so on; when it becomes the duty of the inspector to see they are carried out to the letter and in the spirit.

The inspector has to investigate the particulars of many grievances and complaints. Now, a countrywoman will inform him that her cottage is "fair stinking" in consequence of a pool of water at her door made by the stoppage of the drain used in common with a next-door neighbour; or that the water supply, which is a tiny rill, perhaps, in the corner of a distant field, is scantier than ever; or that her neighbour's pig is kept so close to her house as to be a nuisance; or the droppings of feathers from her neighbour's pigeons choke the spoutings of her house and make the foundations damp. Now, a countryman will ask him whether his neighbour has any right to heap up his sheep so near his house that the odour from it should pervade it; or place his haystack where it darkens his windows; or whether the village butcher should kill his sheep so close to his back door as to be offensive; or the village baker use an ash-midden adjoining his bakery. Now, a town-dweller will complain that the moisture from his neighbour's cow-byre soaks into his house; that a neighbour's midden is overflowing; that neighbours throw their slops into the road and cause damp; that a neighbour is turning his house into a common lodging-house, and thereby encouraging all sorts of characters to come about the place; that a gale has blown his roof off, and his landlord delays to put it on again; that a storm cundy has overflowed and the waters penetrated into his kitchen; that there is an unaccountable smell all through his house; that a family is ill of fever close by; and so on. All these complaints are, properly, entered in a book, and reported at the first meeting of the Sanitary Authority. Where remedy can be applied, the inspector is instructed to take the measures that are necessary. When the grievance is capable of adjustment by arrangement with either landlord or neighbour, this course is recommended. And gradually all the difficulties are overcome. In the ten years that have elapsed since the passing

of the Act, a great stride has been made in the public appreciation of sanitary constructive works. Much of the violent opposition to all improvements has tamed down. Most towns have set themselves in some kind of order. The great drawback of expense has been overcome. Numerous villages that were without water, save private supplies from wells to some of the houses, have gladly welcomed the small rate that has brought some distant hillside spring to their doors. Many villages, too, that were defaced with open gutters, full of objectionable matters, have been at the expense of laying down covered pipes, by means of which the unwholesome sewage is carried harmlessly away. All new buildings, on the remotest hillside, in the narrow close or wide street, from the smallest cottage to the finest residence, benefit by the general regard for sanitary improvements as set out in the local regulations.

Altogether the new profession gives evidence of a vigorous vitality. It has its association, its serials, its handbooks, and guidebooks. The most recent work is "A Practical Guide for Inspectors of Nuisances," by Mr. F. R. Wilson, in which is set forth much information valuable to those who are new to their duties. Without encroaching on the duties of surveyors, many instructions are conveyed concerning small constructive works that are likely to be placed in the charge of an inspector, by virtue of the General Order, which states that "He shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within the district." Specifications are inserted of works that have been executed in laying down water-mains to villages, and sewage systems in limited localities, and the useful suggestions made by the Local Government Board as to water-supplies and sewerage are included. Mr. Wilson, who has acted as inspector for the Rural Authority of the Union of Alnwick since the formation of the office, gives details from his own experience, which are calculated to serve as warnings and precedents, and shows the bearing of the Act upon the various contingencies with which the inspector has to deal. Numerous sanitary contrivances and inventions are also duly mentioned in his comprehensive manual.

#### THE SOCIETY OF BRITISH ARTISTS.

THE fifty-ninth annual exhibition of this Society opened this week, and it may be conceded that an exhibition which has attained so respectable an age must have done so by fulfilling some public want in regard to art, but what that want can be the present exhibition, at least, does not enable us to understand. The water-colour collection, as usual, shows the best average of any room in the exhibition, the number of water-colour painters who rise to or above mediocrity being probably greater in proportion to the total number than in the larger and more widely-worked field of oil painting; and the hanging space being smaller may also lead to the necessity of a somewhat more exclusive selection. It is a pity the committee do not shut up one or two of the other rooms, if that would enable them to adopt a little more stringent rule of selection; and if they would get rid of one or two of their members by a vote of censure, there might be a better chance of obtaining for their exhibition more respect. As it is, there are paintings hung on the line, and the work of members, which are simply beneath any sort of criticism, and are little short of an affront to the spectator.

The few works which form redeeming points are chiefly by a few contributors whom we have noticed in previous years as better than their surroundings, and some of these are not members. Mr. Ammonier, for instance, contributes a landscape (500), and Mr. Coudery a cat-picture (342), which represent, of course, some of the high qualities of these artists in their respective classes of subject, though not showing either of them at their best. Mr. Jas. Baylis, who is one of the members who has claims to exhibit in better company, has a clever picture representing "Preparations for the Harvest Service" (441), and another, "The Highest Bidder," which we seem to have seen somewhere else lately. There is freshness and movement in Mr. Edwin Ellis's "Morning after the Storm" (453), a sea-painting of some force

though; we cannot quite accept the painter's idea of this tone of sea-water under any atmospheric conditions. One or two large landscapes by Mr. Grace are, as usual, pleasing without showing much power; his small work, "Autumn Sunset" (466), is much superior to the larger ones. There are some good heads in the large painting, "Polly my Wife, and Polly my Ship," by Mr. Symonds, which hangs at the top of the large room. Mr. Wyke Bayliss contributes an interior of "St. Madeleine, Troyes" (132), and one or two other architectural subjects in his usual effective and highly-finished style, which sometimes errs on the side of over-elaborated effect, having more of art than nature. Among those which we noted as above the average may be named "The Village Barber" (126), by Mr. John Burr; 122 (no title), still-life in the shape of a skull and a book, &c., by Miss M. Eley, "A Little Mother" (133), Miss Lizzie Reid, "Sunlight" (160), Mr. John R. Reid; "The First Lesson" (166), Mr. Ansty Dollond; "Azaleas" (186), Miss Catharine Wood; "A Lobster Pie" (218), Mr. J. J. Banastyne; "Moel Wyn" (234), Mr. James Peel; "Poor Pasture" (336), Mr. Yeend King; "A Storm" (396), Mr. John R. Reid; "On Hampstead Heath" (407), Mr. J. H. Mole; "Kept in" (451), Mr. A. Dixon; "Near Barrow-on-the-Trent" (473), Mr. Jas. Peel; and "The Palace of the Cæsars" (742), a Roman sketch, by Mr. A. B. Donaldson.

#### THE KENSINGTON ARTISTS.

LONG before South Kensington was in existence and became famous as an art district, royal and secluded Kensington, the Kensington of Queen Anne and of Blackney, was a favourite home for the artists; since the days when Wilkie was a conspicuous resident the painters have always clustered about the quiet Kensington Gardens, the cedars of the Palace, and what was then called the Gravel Pit; painters endeared to old frequenters of the Royal Academy exhibitions, lovers of modern art still living who remember the days at Somerset House and later on in Trafalgar-square, when Mulready and Crewick, Wilkie, Egg, the Chalonis, Frith, Ward, Cope, Redgrave, Cooke, Horsley, and we know not how many more, formed the set of Kensington artists. Those were the days when the traditions were still to some extent kept alive of the time when it was almost Freemasonic etiquette for the more famous artists to keep secret the subject of their forthcoming exhibitions at the Royal Academy, though already the custom was introduced of a limited set being invited to visit a few, a very few, popular artists' houses—the word studio had not come into vogue,—on the Sunday afternoon, previously to the reception of the pictures on the traditional Monday and Tuesday either at the beginning of April or the end of March, two days having, by some strange condition in the constitution of the Academy, been considered for a century as sufficient time for the reception of the several thousand pictures "sent in" for selection. In Paris, at the Salon, which opens its doors on the same day as the Academy, more than a fortnight of the month of March is appropriated for the reception of the pictures (that sculptors have three weeks), and the Parisians certainly succeed in hanging with it, must be admitted, excessive fairness a number of pictures which exceeds by many hundreds that exhibition of the Royal Academy.\*

Of late years in London, as all those interested in art are aware, the great artists have opened towards the close of March their splendid studios doors more or less freely to their admiring and opulent friends, for the purpose of showing the pictures that are expected to be exhibited at Burlington House in May. To many persons these visits have afforded a very great pleasure; and certainly, years ago, it was difficult for a lover of art to find a more agreeable way of passing an afternoon. But of late these picture-receptions have assumed a somewhat different character; they have become crowded exhibitions of social celebrities, the people visiting the studios, and the studio itself appearing to rival the attraction of the pictures exhibited. Wearied artists have more than once expressed displeasure at the apparent want of interest that many of their guests have shown in the real object of the visit. Whether or not that be so, or that, large as our painters' studios have become, they

\* The Salon catalogue of last year contained 4,386 numbers; that of the Royal Academy, 1,371.



## MORE ABOUT THE BUILDING EXHIBITION.

THIS Exhibition, now open at the Agricultural Hall, Islington, was very largely attended during last week, 30,000 persons, we are told, having passed the turnstiles. The attendance this week promises to be even larger. Our readers who have not yet visited the exhibition may be reminded that it will close this Saturday, April 1st. We supplement the lengthy notice which we gave last week by the following further notes.

**Bricks, Tiles, Terra-Cotta, &c.**—In Bay 21, the Wortley Fire-Clay Company exhibit upwards of a thousand glazed bricks, walled. They are excellent bricks, possessing a very pure and clear white glaze. At Stand 89, Mr. Thos. Lawrence, of Bracknell, has on view some good specimens of carved panels in red brickwork. The "orange pressed facing bricks" here shown appear to be very good. Very well worth special examination are the machine-made malt-kiln tiles exhibited by Messrs. Stanley Bros. (Stand 86). They are of fire-clay, well fired and yet perfectly free from warping, and are perforated in a very beautiful and ingenious way. Messrs. Joseph Clift & Sons enamelled fireclay bricks, in various colours, are very good in finish and remarkably true in shape. The "Paragon Bay Windows," shown by the Paragon Brick and Tile Company at Stand 83, are worth attention. The columns of the bay are built up with blocks (only four or five of which are required to make a column), instead of with bricks, as in the ordinary manner.

**Chimney-pieces, &c.**—Messrs. W. Walker & Sons, of Buehll-row, have, at Stand 64, an excellent display of oak and walnut chimney-pieces, most of them good in design, and all of them characterised by excellence of workmanship. This firm have the largest show of wooden chimney-pieces in the exhibition. Messrs. Underhill & Co., Stand 48, show a large number of chimney-pieces, good as to material and workmanship, but some of them too exuberant in design. Some of the dining-room chimney-pieces, however, are very good, and altogether the Stand is well worthy of attention. In Bay No. 12 Mr. Alfred Braby has a large display of marble and enamelled slate chimney-pieces, as well as marble lavatory-tops, &c.

**Stoves and Warming Apparatus.**—The "Westminster" slow-combustion, smoke-consuming grate, exhibited by Messrs. Steven Bros., at Stand 45, deserves examination. It has a bottom formed of a slab of fireclay, which is kept just above the level of the hearth, so as to allow of the cold air of the room passing beneath it into a hollow iron-box or chamber behind the fire-back, whence it is directed through a horizontal slit into the fire, just at the point needed to assist combustion. Some good specimens of electro-bronzed stoves are exhibited by this firm. Messrs. Underhill & Co. (Stand 48) have a useful assortment of stoves and grates, including the "Sovereign Eclipse" tiled register. Messrs. Messenger & Co., of Loughborough, exhibit the "Loughborough" boiler, for warming horticultural and other buildings.

**Ventilators.**—The Sanitary Engineering and Ventilation Company, of Victoria-street, Westminster, exhibit, in action, at Stand 112, the "Zeolus" or water-spray ventilator (Messrs. n's patent). With a consumption of water equal to forty gallons per hour, very useful work is done in distributing cooled, cleansed, and moistened air at the rate, we are informed, of 10,000 cubic feet during the same period of time. We understand that experiments have shown the attractive force of the water-spray to be such that air is sucked into the apparatus (which is exceedingly simple and unlikely to get out of order) at a velocity which can be varied at pleasure from a minimum of 150 lineal ft. per minute to a maximum of 500 ft. per minute. When the condition of the atmosphere does not require the use of the water-spray, the ventilator introduces fresh air in vertical currents in the same manner as the ordinary vertical-tube ventilators. By means of a gas-burner the temperature of the inflowing air can be raised in winter time. The "Zeolus" appears to be well adapted for use in theatres and public buildings, and for smoking and billiard rooms. It should certainly be seen by all visitors to the exhibition. Mr. Edgar Aldous exhibits, at Stand 156, a hot and foul air extractor, of which he is the inventor and patentee. The theory of its action is this: the exhaust consists of two concentric shafts. Between the inner and outer shafts is a space

for foul air to pass upwards. There is a fixed head, divided into wedge-shaped compartments or apertures, to receive the wind from whatever quarter it may be blowing. At the back of these apertures are holes through which the wind is deflected into the inner concentric shaft, which is carried down for 12 in., 18 in., or more, according to the size of the apparatus. This inner concentric shaft is provided with a conical or, rather, egg-ended bottom, against which the wind blowing down through the apertures in the head impinges, and is deflected upwards for a short distance to find its exit through other apertures nearly at the bottom of the inner concentric shaft, and so creating an up-current in the space between the two shafts which form the exhaust, and into which space exhaust-tubes from the various rooms of a house can be led.

**Sanitary Pottery.**—We can speak of only a few of the exhibits under this head. Besides drain-pipes, Messrs. James Stiff & Sons (Bay No. 20) show the "Weatherly Disconnector Waste-water Trap." It possesses many advantages as a gully-trap. Weaver's "Ventilating Sewer-air Trap," shown by the same firm, affords a simple means of shutting off sewer gas from the house-drain. Another very good trap is the registered "Interceptor" sewer-air trap, for fixing between the house and the sewer. The Wortley Fire-clay Company (Bay 21) exhibit Jackson's patent water and gas-tight joint in stoneware tubes. It is a modification of the spigot and socket joint, but when the pipes are put together ready for the joint to be made, an annular space is left all round between the spigot and the collar. This annular space is filled up by pouring into it, through a hole left at the top of the collar, liquid cement of the consistency of thick cream, the spigot and the interior of the collar being grooved to form a key for the cement, none of which can escape into the interior of the drain. It appears to be a very good joint, and will be looked at with interest. Messrs. Doulton & Co., at their stand in the centre of the hall, exhibit a variety of sanitary pottery, including Lovegrove's and other traps, and the "Kenon" air-chambered floor for basements. Messrs. T. Smith & Co. (Bay 25) have a large variety of stoneware pipes, traps, and hoppers. Messrs. Joseph Clift & Sons, Wortley (Bay 23), have some excellent baths, sinks, troughs, mangers, and other large-sized vessels, each made in one piece of fireclay, and enamelled inside. For cleanliness and appearance nothing could be better than these exhibits, which, especially the baths, are not so heavy as is usually the case. Messrs. Shanks & Co. (Bay No. 9) exhibit a very good glazed fireclay sink, suitable for butlers' use.

**Kitcheners and Ranges.**—Messrs. Clement Jeakes & Co. (Bay No. 15) are important exhibitors of ranges, pastry-ovens, &c., suited for large or small establishments. They are also exhibitors of washing-machines, hydro-extractors, and other apparatus for use in laundries.

**Iron Railings, Gates, and Balconies** are shown in various forms, for the most part well designed, by the Coalbrookdale Company (Stand 38). The castings are all very good.

**The Bower-Barff Rustless Iron** is shown at Stand 115, in various articles. Difficulties which have hitherto stood in the way of the adequate working of the process have now, we are informed, been removed, and it is hoped that this preservative process will soon be largely adopted.

**Corrugated Iron** in its various applications as a material for the erection of temporary buildings is shown in the South Gallery, by Mr. J. Charlton Humphreys, of New Bridge-street; also by Messrs. Treggon & Co., at Stand 60.

**Silicate Cotton**, or slag wool, is shown by Messrs. Frederick Jones & Co., at Stand 97, also Baatsch's patent slag felt (manufactured from silicate cotton), for sound-proofing floors and partitions, and for preventing the radiation of heat and the spread of fire. By the same exhibitors is shown Stewart's "Cotton Metallic Pipe-casing," claimed to be fire and frost proof. In this connection we may also mention Leroy's patent non-conducting composition for coating steam boilers and hot and cold water pipes, shown at Stand 25. It has been largely used.

**Water-Fittings.**—Messrs. Hayward Tyler & Co. exhibit in Bay 16a a varied selection of hydrants, standposts, stop-valves, branch-pipes, and connexions, suitable for fire-extinguishing purposes. They show some steam and hot-water valves and cocks, pumps for deep and shallow wells, and some excellent bath and

are still too small to receive the crowd of art-lovers that appear now to be descending upon us, or whether it is for other reasons equally uncertain, this year, at least in the Kensington district,—a wide artistic area,—a few of the artists have shown a desire to avoid the inconvenience of the customary visit to their studios, and they have inaugurated what, even in these days of apparently exhausted exhibitions, may be called a novelty. It had been some time understood that the Kensington painters,—for we do not hear of the sculptors and architects taking any part in the idea,—had this year determined to exhibit at the Kensington Town-hall their Royal Academy pictures previously to their being "sent in," and it was supposed by not a few that the exhibition was to take, in a measure, the place of the studio show. The list of "contributing artists" was characteristic, the name of the President of the Academy, Mr. Millais, and a number of other prominent Kensingtonians, Academicians, promised a treat. It was, therefore, to some of the guests at the *conversations* of Friday evening last, not a little disappointing to find that the more familiar names were alone represented by pictures that have long since been exhibited. Mr. Millais's "Beef-eater" and several other contributions were "old friends." Apart from this little disappointment, the gathering was eminently successful. Artistic Kensington was represented in its most characteristic residents,—Mr. Andell, Mr. Archer, Mr. Barlow, Mr. Boughton, Mr. Barwell, Sig. Bacconi, Mr. Vicat Cole, Mr. E. H. Corbould, Mr. Chester, Mr. A. Donaldson (who contributed two charming reminiscences of Florence), Mr. Bird (the energetic honorary secretary of the whole affair), Mr. Fildes, Mr. Horsley, Mr. Alfred Hunt, Miss Havers, Mr. Hicks, Mr. Colin Hunter, Mr. Lehmann, Henry and Albert Moore, Mr. MacCallum, Mr. Poynter, Mr. Prinsep, Mr. Redgrave, Mr. Marcus Stone, Mr. Newton, and a number of others. Of the pictures we must be excused any criticism, "old friends" have before run the gauntlet; of the new acquaintances it would be unfair, on so slight an introduction obtained in a crowd, to form an opinion.

The *conversations* was what all Londoners have long since become accustomed to, and in virtue of the usual crowd and the guests present was, we suppose, what may be called a conspicuous success; the difficulty of seeing the pictures being at least characteristic of many similar entertainments.

Some think that this system of exhibiting pictures previously to their being shown at the Academy may in future years with good management become an institution, and certainly, judging by the visitors of Friday and Saturday, it promises to reach that point that, whatever artists may say, they are most in search of,—very great popularity. Perhaps we shall see at Kensington in future years, probably at Baywater, at St. John's Wood, at Hampstead, at Lambeth, and at Bethnal-green, similar pleasant gatherings.

But, after all, we fancy our Parisian brother artists adopt the best method; to their artistic clubs, the Meritons and the Crémier,—there have been additions to their number lately,—supply an opportunity for the early exhibition of the pictures of the season, all of which are *bona fide* novelties; and we think our artistic clubs would do well to emulate their Continental brethren in this matter; they have ample room, and the subject of art, whatever the cynics may say, is exceedingly engrossing, even in these days of political and sporting interests, art combining, like sport and politics, quite sufficient commercial importance to make the subject worthy the consideration of the seriously-minded.

**The Memorial to Lord Lawrence.**—The memorial to the late Lord Lawrence, the gray granite pedestal of which is now in position in Waterloo-place, consists of a bronze statue 8 ft. 6 in. in height in a standing position, with a drawn sword in one hand. Below, on the bronze base, are the words, "Will you be governed by the pen or the sword?" and the inscription, which, for the present, is hidden by a wooden hoarding, on the pedestal is as follows:—"John, first Lord Lawrence, Ruler of the Punjab during the Sepoy Mutiny of 1857, Viceroy of India from 1854 to 1859. Erected by his fellow-subjects, British and Indian, A.D. 1882." The work has been executed by Mr. J. B. Boehm, A.R.A., and the bronze figure has been cast at the foundry of Messrs. Moore & Co., of Thames Ditton.



doche valves and lavatory fittings. They have also on view a neat arrangement of tip-up lavatory basins on light iron standards, and with marble top. Their fall-flush valves, closet and flushing-apparatus have been previously noticed by us as possessing a fine good point. Messrs. Quirk, Barton, & Co., have, at Stand 24, their tin-lined lead pipe, also tin-lined sheet lead for cisterns, &c. The advantages afforded by these materials are obvious. Messrs. R. F. Dale & Co. (Stand 131) show their "Southwark" ball-valve, their safety-tap for preventing the explosion of kitchen boilers, and plumbers' brass-work generally, all characterised by good finish. Messrs. Doulton's water-waste preventers and water-locking apparatus for baths, as well as other things of the kind exhibited by them, well merit attention and use. Messrs. John Bolding & Sons (Stand 14) also show some excellent water-fittings and plumbers' brass-work. Messrs. John Warner & Sons, at their stand in the South Gallery, have a good selection of pumps, plumbers' brasswork, and bath and other fittings, all characterised by the excellence for which the name of the firm is a synonym.

*Penstocks, tide-flaps, manhole-doors, ventilators, and other details connected with sewerage works* are shown by Messrs. G. Waller & Co. of Southwark (Stand 26). Here also are to be seen Shone's house sewage ejector, a complete set of drain-cleaning tools, and a useful iron dust-bin, made on the same principle as, but differing in shape from, the "street orderly" bins used in the City.

*Water-closets and Drawn-lead Traps.*—Messrs. John Warner & Sons, whose stand is in the South Gallery, have some very good water-closets, as well as pan-closets with earthenware containers. They also exhibit a ship's water-closet, for discharging below water-line. Messrs. George Farmilon & Sons (Bay 19) are exhibitors of water-closets and American drawn-lead traps for closets, baths, and sinks. Mr. Henry Conolly (Stand 47) is an exhibitor of improved valve closets with overflow basins, water-waste preventers, and other goods of the kind which deserve attention.

*Pneumatic Bells, Despatch Tubes, and Speaking Tubes,* are shown by Mr. Zimdars at Stand 65. The pneumatic despatch tube is provided with a "carrier" for letters or other papers desired to be conveyed from one part of a building to another, and is, indeed, on the same principle as the pneumatic tubes in use by the Telegraph Department of the Post Office. The speaking-tube shown at this stand is worth attention. The trumpet-mouth at either end, when not in use, is fixed into a sort of catch. By the act of liberating one end of the tube in order to speak through it, a pneumatic bell is rung at the other end of the tube, to give notice to the person in the room where it is placed that some one desires to speak to him. In the same way as at the other end he releases his end of the tube ready to listen and reply, the act of releasing his end ringing a pneumatic bell at the opposite end, and thus intimating his readiness to be spoken to.

*Spence's Metal.*—This useful material, to which we have on former occasions made reference, is shown at Stand 82 in some of its varied applications. Its artistic and decorative capabilities are shown in numerous busts and statuettes, and in panels in relief for cabinets, chimney-pieces, &c., some of the busts, however, would appear to better advantage if allowed to remain untouched by the bronzer. The green bronze applied to the features in some of the specimens gives them (especially by gaslight) a somewhat ghastly appearance. Joints made of this material in socketed and flanged gas mains by the workmen of the South Metropolitan Gas Company, are also shown, and the material is now being used for the joints of scrubbers and other gas-making apparatus. For use instead of lead for fixing iron railings into stone it is well adapted. It claims to be 75 per cent. cheaper than lead, and is much more easily used.

Glass of every description for building and decorative purposes is shown at Stand 75 by Messrs. John Hall & Co., of Marylebone and Bristol.

At Stand 60a Messrs. Meakin & Co. exhibit their convenient and safe sash fastener and opener (which automatically locks the window whether the latter is left open or closed), and their new "solid frame dilable sash-pulleys," with large bearings, for heavy sashes. These are well worth examination.

Among other exhibits which deserve the

attention of visitors is the Mangotsfield stone (Bine Pennant), shown at Stand 133 by the Mangotsfield Pennant Stone Company. This stone is largely used in Bristol and other towns in the West of England for kerbing, flagging, and street crossings. It is nearly as hard as granite, but does not wear so slippery. The "Instantaneous Grip" vices shown by Mr. T. J. Syer at Stand 93 are also worth attention.

We are glad to hear that H.R.H. the Prince of Wales and some other members of the Royal family intend visiting the Exhibition this Friday, the 31st of March.

#### ELECTRIC RAILWAYS.

At the Royal Institution, on Friday, the 24th of March last, a lecture on this subject was delivered by Professor W. E. Ayrton, F.R.S. In the course of it the lecturer said,—"To propel a train we must either utilise the energy of coal by burning it, or use the energy possessed by a mountain stream, or the energy stored up in chemicals, and which is given out when the chemicals are allowed to combine, or we must employ the energy of the wind. Practically we employ at present only the first store for propelling railway trains,—the potential energy of coal; and that is to a great extent the store on which we shall still draw, even when we employ electric railways. For experience shows that, with the modern steam-engine and dynamo, at least one-twentieth of the energy in coal can be converted into electric energy; and that this is at least twenty times as economical as the direct conversion of the energy of zinc into electric energy by burning it in a galvanic battery. But it may be asked, did not Faraday's discovery, in 1831, that a current could be produced by the relative motion of a magnet and a coil of wire, settle this point half a century ago? Theoretically, yes; practically, however, the problem was very far from being solved, because the dynamo-machine was very uneconomical, and it was not until Poincotti, in 1860, solved the problem of obtaining a practically continuous current from a number of intermittent currents, and until Gramme, about 1872, carried out Poincotti's idea in the actual construction of large working machines, that the mechanical production of currents became commercially possible. [Experiments were then shown illustrating the complete electric transmission of power, a gas-engine on the platform giving rapid motion to a magneto-electric machine, and the current thereby produced sent through an electro-motor at the other end of the room, which worked on an ordinary lathe.] In electric transmission of power there is not only waste of power from mechanical friction, but also from electric friction arising from the electric current heating the wire, through which it passed. It was then explained and demonstrated experimentally that this latter waste could be made extremely small by placing so light a load on the electro-motor, that it ran nearly as fast as the generator or dynamo, which converted the mechanical energy into electric energy; actual experiments leading to the result that for every foot-pound of work done by the steam-engine on the generator, quite sevenths of a foot-pound of work can be done by the distant motor. One reason why electric transmission of power can be effected with so little waste is because electricity has apparently no mass, and consequently no inertia; there is, therefore, no waste of power in making it go round a corner, as there is with water or with any kind of material fluid. Another reason why electro-motors are so valuable for travelling machinery is on account of the light weight of the motor. Experiment shows that one-horse power can be developed per 50 lb. of dead weight of electro-motor; a result immensely more favourable than can be obtained with steam, gas, or compressed-air engines.

In addition to the loss of power arising from the heating of the wires by the passage of the current, there is another kind of loss that may be most serious in the case of a long electric railway, viz., that arising from actual leakage of the electricity due to defective insulation. To send an electric current through a distant motor, two wires, a "going" and "return" wire must be employed, insulated from one another by silk, gutta-percha, or some insulating substance; and if the motor be on a moving train, there must be some means of keeping up continuous connexion between the two ends of the moving

electro-motor and the going and return wire. The simplest plan is to use the two rails as the two wires, and make connexion with the motor through the wheels of the train; those on one side being well insulated from those of the other, otherwise the current would pass through the axles of the wheels, instead of through the motor. It is this simple plan that is employed in Siemens's Lichtenfelde Electric Railway, now running at Berlin; the insulation arising from the rails being merely laid on wooden sleepers having been found sufficient for the short length, one mile and a half. The car is similar to an ordinary tram-car, and holds twenty passengers. [Photographs were then projected on the screen of this and of the original electric railway laid by Siemens in the grounds of the Berlin Exhibition of 1879, and exhibited in 1881 at the Crystal Palace, Sydenham.] It was explained that on this latter railway, which was 900 yards long, both the ordinary rails were used as the return wire, and that the going wire was a third insulated rail rubbed by the passing train. [Photographs were then projected on the screen of Siemens's electric tram-car at Paris, used to carry fifty passengers backwards and forwards last year to the Electrical Exhibition.] In this the going and return wires were overhead and insulated, connexion being maintained between them and the moving car by two light wires attached to the car, and which pulled along two little carriages running on the overhead insulated wires, and making electric contact with them. [Experiments followed, proving that although two bare wires lying on the ground could be quite efficiently employed as the going and return wire, if the wires were short and the ground dry, the leakage that occurred if the wires were long and the ground moist was so great as to more than compensate for the absence of the locomotive.] Consequently, Professor Perry and myself have for some time past been working out practical means for overcoming these difficulties, and we have arrived at what we hope is an extremely satisfactory solution. Instead of supplying electricity to one very long not very well insulated rail, we lay by the side of our railway line a well-insulated cable, which conveys the main current. The rail, which is rubbed by the moving train, and which supplies it with electric energy, we subdivide into a number of sections, each fairly well insulated from its neighbour and from the ground; and we arrange that at any moment only that section or sections which may be in the immediate neighbourhood of the train shall be connected with the main cable, the connexion being, of course, made automatically with the moving train. As, then, leakage to the earth of the strong propelling electric current can only take place from that section or sections of the rail which may be in the immediate neighbourhood of the train, the loss of power by leakage is very much less than in the case of a single imperfectly-insulated rail such as has been hitherto employed, and which, being of great length, with its correspondingly large number of points of support, would offer endless points of escape to the motive current.

Dr. Siemens has experimentally demonstrated that an electric railway can be used for a mile or two. Professor Perry and myself, by keeping in mind the two essentials of success,—viz., attention to both the mechanical and electrical details,—have, we venture to think, devised means for reducing the leakage on the longest railway to less than what it would be on the shortest. For the purpose of automatically making connexion between the main well-insulated cable and the rubbed rail in the neighbourhood of the moving train we have devised various means.

When we commit the carrying of our power to that fleet messenger to which we have been accustomed to entrust the carrying of our thoughts, then shall we have railways that will combine speed, economy, and safety; and last, but not least to us Londoners, we shall have the entire absence of smoke, the presence of which nearly causes the convenience of the Underground Railway to be balanced by the pernicious character of its atmosphere.

**Artisans and Labourers' Dwelling Improvement Act, 1879.**—The Home Secretary has appointed Mr. Robert Collier, Driver (of the firm of Messrs. Driver & Co., of Whitehall) the arbitrator in the Great Peter-street, Westminster, Improvement Scheme.



## A MODEL THEATRE.

The Committee of the Hygienic Exhibition held this year at Berlin have decided to open a competition for designs for a Model Theatre. As prizes for the three best solutions of the problem they offer a total sum of 8,000 marks. The designs are to be sent in not later than midday, August 5, 1882. The conditions to be fulfilled in the model theatre are described in the programme as follows:—There are to be seats for 1,700 persons, exclusive of a certain amount of standing-room. While ample corridors, foyers, wardrobes, and buffets are to be provided for the audience, the personnel of the stage and orchestra are to have the following apartments for their accommodation,—a general assembly or sitting-room for the orchestra; six dressing-rooms, each for one person of the professional staff; six larger ones, for from two to six persons each; and six still larger, for from twenty to thirty persons each, including choristers and supernumeraries. Near the stage there are also to be a conversation-room, and three rooms for practice and rehearsals. There are likewise to be provided in the building, dwelling apartments for a housekeeper, and rooms for the acting and stage managers, for a medical man, and for the library. Store-rooms or magazines are to be provided, capable of containing 100 sets of decorations, besides furniture, wardrobe, and other stage properties. Suitable accommodation is likewise to be found for the lighting-apparatus, the watchman, and the stage workmen. The lighting of the theatre is supposed to be by gas, but the arrangement is to be such that electricity may be readily substituted without serious building alterations. The heating-apparatus is to be capable of producing a temperature of about 59° Fahr. for the staircases, vestibules, and corridors; about 64° for the auditorium, stage, and adjoining parts; and 68° for the dressing-rooms, when the cold outside, in the open air, is as low as 4° below zero. As regards ventilation, the arrangements must be such as to render it possible to introduce 25 cubic metres of fresh air per head of the audience, per hour, and as much as 35 cubic metres in case of excessively hot weather. The air in the stage division is to be renewed twice an hour, and to be capable of being kept tolerably cool in the excessive heats of summer.

Along with the drawings the committee also require a description showing how the audience are to pass in and out of the house, and the time within which the auditorium can be cleared without danger. The space to be allowed per head of the seated audience is fifty centimetres in breadth and thirty in depth. The rate at which the stream of persons leaving the house is calculated to move is to be proved from the form, gradient, and general construction of the passages and exits. The committee adds that it attaches much more weight to the satisfactory solution of the questions of safety raised by the recent calamities at the Nice and Vienna (Ring) Theatres than to the other architectural details.

## THE LATE MR. ROBERT H. SHOUT, ARCHITECT.

On the 15th ult. death removed this earnest but modest worker in the field of art. During the past eight or ten years Mr. Shout had been afflicted with a malady which incapacitated him from following his profession, to which he was much attached. He was articled to the late William Tress; commenced practice about thirty years since in the West of England; and resided successively in Bristol, Sherborne, Yeovil, and Dorchester. During the twenty years he was in practice, he was actively engaged in the restoration and partial rebuilding of many of the small churches in Somerset and Dorset, and in the erection of parsonages, schools, farm buildings, cemeteries, and residences in that district. The painstaking restoration of the fine Perpendicular church at Yeovil attracted much attention. The new parish church at Evershot, the cemetery at Yeovil, and the rectory of Mr. Messiter's mansion near Yeovil, are amongst the best of his works.

He numbered amongst his clients the late Earls of Ilchester, Lord Digby, and Lady Fane, and was constantly engaged by many of the resident gentry in carrying out additions and improvements to their residences, farms, &c. His last work was the erection of a large set of farm buildings and residences at Horsington, Somerset, for Mr. Doddington.

His buildings were designed with great care, and mostly carried out with Ham Hill stone, a material to which he was very partial on account of its rich, warm tint.

Mr. Shout was buried in Brompton Cemetery on the 21st ult.

## BRICK-COURT, MIDDLE TEMPLE.

The gradual demolition of buildings in the Temple cannot but be a matter of regret to the antiquary, the architect, and the man of letters, and although their destruction may be sought to be justified upon the ground that they have outlived the purposes for which they were originally intended, it is difficult to avoid the conviction that their removal is prompted by other reasons, and that the wholesale re-building is a pretext to lessen the apparent income receivable from a gigantic monopoly, and an attempt to conciliate the rich at the expense of the poorer members of the community.

The next locality marked for obliteration is Brick-court, an open area out of the west side of Middle Temple-lane, bounded upon three sides by three blocks of chambers, the central block backing upon the buildings on the east side of Essex-court.

The houses are four stories in height, and are brick-built, with plain square window openings, with wooden sashes nearly flush with the external face of the wall, and stone pedimented doorways, one in the centre of each block. There is an entire absence of pretension about the design, but it conveys an impression of repose and solidity which is seldom attained in the present day, and the absence of which is distinctly felt in most modern architecture. The five houses (the northern block being divided into two) are all of a similar character, with the exception of the house No. 3, which has a bold wooden cornice at the top, of good design. This house was re-built in the year 1704, apparently after having been destroyed by fire, as is attested by the following inscription upon a stone tablet over the entrance doorway:—

PHENICIS INSTAR REVIVISCO  
MARTINO RYDER ARM<sup>o</sup>  
THESAURO  
ANO. DOM. 1704.

They may therefore be fairly considered to be "Queen Anne" houses. The staircases are of oak, with moulded balusters and handrails of pleasing design. On the party-wall between the houses Nos. 4 and 5, Brick-court, at the level of the top floor, is a large sun-dial, with the inscription, "Time and tide tarry for no man," one of those that Charles Lamb apostrophised, "What an antique air had the sun-dials, with their moral inscriptions, seeming co-ovals with that time which they measured."

"In No. 2, Brick-court, Middle Temple-lane," says Peter Cunningham, "up two pairs of stairs, for so Mr. Fibby, his tailor, describes him, lived and died Oliver Goldsmith. His rooms were on the right hand as you ascend the staircase."

Leigh Hunt says that Goldsmith had a first floor elegantly furnished at 2, Brick-court; but this seems to be a mistake. Here he died, and here, while on his death-bed, the landing of his lodgings was filled with inquirers not always of the most reputable character, whom he had befriended in the time of his late and short-lived prosperity.

The success of Goldsmith's comedy of the "Good-natured Man," by which he netted about 500*l.*, led the author into all kinds of extravagance. "The shabby lodgings with Jeffs, the butler," says Irving, "in which he had been worried by Johnson's serenity, were now exchanged for chambers more becoming a man of his ample fortune. The apartments consisted of three rooms on the second floor of No. 2, Brick-court, Middle Temple, on the right hand ascending the staircase, and overlooked the umbrageous walks of the Temple Garden [this is a poetical exaggeration, no portion of the garden being visible from the windows]. . . . He gave dinners to Johnson, Reynolds, Percy, Bickerstaff, and other friends of note, and supper parties to young friends of both sexes. . . . Blackstone, whose chambers were immediately below, and who was studiously occupied on his Commentaries, used to complain of the racket made overhead by his revelling neighbour."

Johnson had rooms on the first floor of No. 1,

Middle Temple-lane, where Boswell was first introduced to him, and it is not improbable that, from the nearness of their residence, Johnson must have frequently visited Goldsmith at his chambers in Brick-court. Here that unlucky dinner took place to which Johnson, Reynolds, and others of his intimate friends were invited, the profusion of which so exasperated them by its needless superfluity, that when the second course was served they declined to partake of it, wishing to rebuke their host for his improvidence.

"I have been, many a time," says Thackeray, "in Goldsmith's chambers, and passed up the staircase which Johnson, and Burke, and Reynolds trod, to see their friend, their poet, their kind Goldsmith,—the stair on which the poor women sat weeping bitterly when they heard that the greatest and most generous of all men was dead within the black oak door."

These are some of the associations of the unpretentious houses in Brick-court, soon to be swept away. Nothing but the most imperious necessity can justify the pulling down of buildings full of so many interesting memories.

## CUP AND RING MARKINGS.

At a meeting of the British Archaeological Association, held on the 15th ult., a paper on the cup and ring markings on stones at Ilkley, by Mr. J. Romilly Allen, F.S.A. (Scotland), was read, in the absence of the author, by Mr. W. De Grey Birch, F.S.A. These markings are found on many of the moorstones, sometimes on the top, but more frequently on the sides,—one of the most curious of the groups being on the "Pancake" Rock, on Rumbold's Moor, a high ridge, 1,010 ft. above the sea-level. Thirteen hollowed cup markings are found on it, enclosed with a connecting ring. Another group is on a stone at the foot of Green Crag, another on Weary-hill, and others on Piper's Craig.

An animated discussion followed, and Mr. J. Brent, F.S.A., suggested that the markings were plans of tribal interments, while the chairman proposed that they were plans of the tribal settlements themselves, while Mr. Loftus Brock pointed out, in support of this latter view, their resemblance to the plans of the dwelling-places on Dartmoor figured by Sir Gardner Wilkinson.

Several of the speakers referred the continuance of these markings to a comparatively late date, a stone similarly marked having been found within a dwelling at Birtley, with a coin of Valentinian and an iron sword, while other markings are found on the walls of brick churches in Germany.

## COST OF ELECTRIC LIGHTING.

LAST week the discussion on a paper entitled "Notes on Electric Light Engineering," by Mr. A. W. Biggs and Mr. W. Worby Beaumont, which was read at a previous meeting of the Society of Engineers, was resumed. The president, Mr. Jabez Church, invited remarks on the relative cost of the electric light as compared with gaslight; one speaker placed before the meeting an account of some experiments which he had just carried out at the Crystal Palace, with the object of comparing the cost of the two methods of lighting. He gave, as an example, the relative cost in a small town requiring 500 lights. The cost of gasworks, pipes, and plant would not be less than 2,000*l.*, this capital cost and that of the production of gas would amount to a charge of 5*s.* per 1,000 cubic feet, this making the cost of 10,000 candle gas light equal to that of 64,000 candle electric light, as generated in thirty-two are lamps by one of Davey, Paxman & Co.'s engines, doing 43-horse power at the Palace. Another speaker said that the statement of the authors was that, according to the information they possessed, incandescent electric lights would cost one penny for seventy-five candle hours, while gas would cost the same for only fifty candle hours. He, however, asserted that the cost of gas would be far less than this; taking the price at 3*s.* per 1,000 cubic feet, gas would cost only 0*s.* 5*d.* 6 for fifty candle hours instead of a penny as stated, the latter being equal to 5*s.* 4*d.* per 1,000 ft. There was considerable difference of opinion expressed as to what the incandescent light would really cost. It was necessary that electric lighting should be worked upon a larger scale before a definite conclusion could be arrived at on this point. It was also remarked



that however cheaply the electric light was produced, it would probably be possible to produce gas more cheaply still, on account of the useful by-products which were obtained by the distillation of coal. Mr. R. P. Spice, C.E., said his belief was, that gas would be found more economical than the electric light. A celebrated electrician in New York had calculated for him that the incandescent light cost seven times as much as the arc light, and, according to his own calculation, the arc light cost three times as much as gas light, taking gas at 3s. a thousand.

#### THE GREEK CHURCH, MOSCOW-ROAD, BAYSWATER.

THE Greek community, now well known in this country, were established here in the beginning of this century. After the destructive War of Independence they came hither seeking for a field for their ability, and must have been endowed with talent and energy, looking at the success they have achieved. They form now one of the most important commercial communities of the country. Their first establishment was in the City, and their first meeting-house in Finsbury-circus. In 1849 they built their first church in London Wall, where there was no space for architectural display. A desire was afterwards felt to migrate to the West, a church being desired near their residences, but a convenient position was not found without great difficulty. In 1874 a subscription was commenced, and a corner site was secured in Moscow-road, Bayswater, at a cost exceeding 10,000l. A building committee was appointed, of which Mr. Mavrogordato was appointed chairman, and that gentleman has supervised the execution of the work to the end. The committee determined to build a church in the Byzantine style, which best conforms with their mode of worship, and they entrusted Mr. John Oldrid Scott with the task of preparing designs and estimates. The plans were of an elaborate and ornamental character, and the first design appeared in the Royal Academy Exhibition, about six years ago. Owing to the commercial depression that intervened, the subscriptions did not come in so abundantly as was requisite for such a scheme (the intention being to build the church by voluntary contribution), and many of the ornamental parts of the scheme, in the shape of marble, terra-cotta, &c., had to be abandoned. Estimates were obtained, and a tender from Messrs. Kirk & Randall, for the sum of 15,000l., was accepted. The foundation-stone was laid on the 18th of July, 1877. The building was opened for service in an unfinished state on Pentecost Sunday, 1879.

A considerable portion of the land acquired had to be surrendered for the enlargement of the adjoining street, through which the site has been reduced to 11,000 square feet. Subscriptions having come in, the interior has been profusely ornamented; and up to the present time the sum spent has been nearly 40,000l. (including cost of the ground). Further decorations, in the shape of mosaics, for the dome and pendentives, are in progress. It is intended subsequently to cover the other vaultings with paintings in fresco.

The accommodation afforded is for about 700, and there are 300 seats. The walls are covered with marbles, and silver lamps are suspended from the vaultings.

Messrs. Farmer & Brindley executed the carving, as well as the woodwork and furniture, including the screen or iconostasis that separates the chancel from the body of the church; also the marble work throughout. The paintings in the screen were executed by Professor Thiersch, of Munich. These represent the chief figures of the Christian worship, and include Christ, with, on his right, the Virgin Mary, St. Sophia, and the angel Michael; on his left, St. John the Baptist and St. George, soldier and martyr. In the upper part of the screen are a series of twelve paintings, giving the principal events of the life of Christ related in the Gospel. Above the screen is a large carved Byzantine cross.

As a whole, the church must be pronounced a remarkable work, unique in this country, and does credit to all concerned.

Externally the building is of brick, and devoid of ornament. It was consecrated by his Grace Antonio, Archbishop of Corfu, assisted by the Very Rev. Archimandrite, Dr. H. Myrianthens, of the Greek Church in Liverpool, and other priests, on the 5th of February last.

#### SKETCHES FROM THE NEW NATURAL HISTORY MUSEUM, CROMWELL ROAD SOUTH KENSINGTON.

THE appropriately-designed storehouse at South Kensington for specimens of natural history, of which we have already given views, is now being gradually filled up with its treasures, and will, doubtless, be more and more visited by the public.

Much pleasure will be found in inspecting its manifold features and details. The study of the way in which innumerable forms of life, animate and inanimate, have been engrafted into the ornamentation of this structure, is extremely interesting, and presents something quite unique. Shells, seaweeds, plants, fishes, birds, reptiles, and beasts, extinct and existing, have all been pressed into the service, from next to simple protoplasm up to the statue of Adam on the apex of the central gable, placed there at the suggestion of Professor Huxley, as representing "Man,—the greatest beast of all."

M. Du Jardin, who, under the direction of the architect, Mr. Waterhouse, modelled, we believe, the whole of the work, deserves credit for evidently possessing the true decorative instinct in addition to his ability in the plastic art. Even the extinct *Machairodus* (scimitar-toothed lion), and the uncouth *Paleotherium* and *Mylodon* have been permeated with this charm without apparently doing violence to scientific record.

The fact of the building being in terra-cotta, inside and out, forms another cause for interest and admiration. We have got to know a good deal about terra-cotta by this time, both in its constructive and æsthetic aspects, but when the architect conceived his design for this museum it was not so, especially not in the new departure he took. Whether the great advantage claimed for terra-cotta of being impervious to the action of a London atmosphere is well founded or not will have to be settled by the test of time, but theoretically it should stand better than any stone under the same conditions. One advantage of the material is the delightful random variety of tone which can be obtained. This toning of a building, one of its greatest beauties, architectural artists have, in this country, mostly to improvise out of their own ingenious heads, but an artist painting a view of the new Natural History Museum will not need to exaggerate anything to secure what he wants; for, given a bright spring morning, and "the picture" is there ready before him: a reproduction of it in pigments on a flat surface is nearly all that need be done.

#### MONREALE, SICILY.

AMONG the interesting evidences of former architectural styles imported into the Island of Sicily, the Saracenic appears to have made the most enduring impression in the neighbourhood of Palermo and the western portions of the island. In the city itself are the churches of San Giovanni and the beautiful chapel in the Palace.

In the grand Norman church of Monreale, the peculiar admixture of Saracenic and Greek feeling are strikingly exhibited. Though the pointed arch is here freely used, it has little in common with that employed by the Northern Gothic builders. The windows and arches are simple in form, and the details generally are of decidedly Greek forms.

The great feature, however, of the church is the wonderful mosaics; these are most extensive, illustrating in the spandrels of the nave arches all the chief personages of the Bible, and many incidents of both the Old and the New Testaments.

The wall spaces are divided and decorated with elaborate mosaics, in geometrical patterns, exhibiting a truly Oriental exuberance of imagination, both in form and colour. The chapels contain some fine wood-carving in high relief, and monuments to the former kings of Sicily, William I., and his sons, Henry, William II., and Roger.

The ascent to the roof is made by a narrow staircase at the west end of the aisles, and affords a fine view over the town and neighbouring country, which in spring is white with the fragrant orange-blossom. The visitor will not fail to notice the quaint rugged old tiles, the rough surface, and fine red and green tones, lending a most picturesque appearance to the exterior.

Adjoining the cathedral is the Benedictine Monastery, the spacious and beautiful cloisters of which form the subject of the accompanying illustration. They are of considerable extent, measuring 169 ft. square, surrounded by an arcade of small pointed arches, supported on coupled columns of white marble, with a group of four at each corner.

An interesting feature is a small fountain in the south corner, inclosed by a projecting portico. The columns, as will be seen by the sketch, are decorated in alternate pairs in various ways, and formerly contained mosaics in bands; the latter have, however, unfortunately been destroyed. The varied and beautiful capitals to the small columns form, in themselves, a museum of architectural carving, presenting an infinite variety of quaint and elaborate designs, no two of which are precisely similar.

The almost Oriental elaboration of the details of these decorations gives a peculiar effect of richness to the architecture of these interesting specimens of Sicilian-Norman work, of which other examples may be found in various parts of the island.

The modern portion of the monastery is now used as officers' quarters: this contains a fine marble staircase and some pictures.

From the cloister garden a magnificent view is obtained over the valley of Palermo, with the encircling mountains; and, nearer, the luxuriant orange and lemon groves which form so conspicuous a feature in the Palermitan landscape.

The date of the foundation of the Benedictine Abbey of Monreale is 1174, and that of the Cathedral 1174-89. Its length is 333 ft.; its width, 131 ft.; it has three apses, a nave, and two aisles, and is flanked by two square towers. The entrance is by two fine bronze entrance-gates dating from 1185.

A pleasant run of twenty-four hours from Naples brings the traveller to Palermo, whence Monreale can be reached by carriage in about one hour and a half. The quaint and picturesque dress of the men of the country will be noticed, and the brilliantly-coloured carts, many of them decorated with figure-subjects, by primitive artists, with a sublime disregard of drawing and perspective.

HENRY T. TIMMINS.

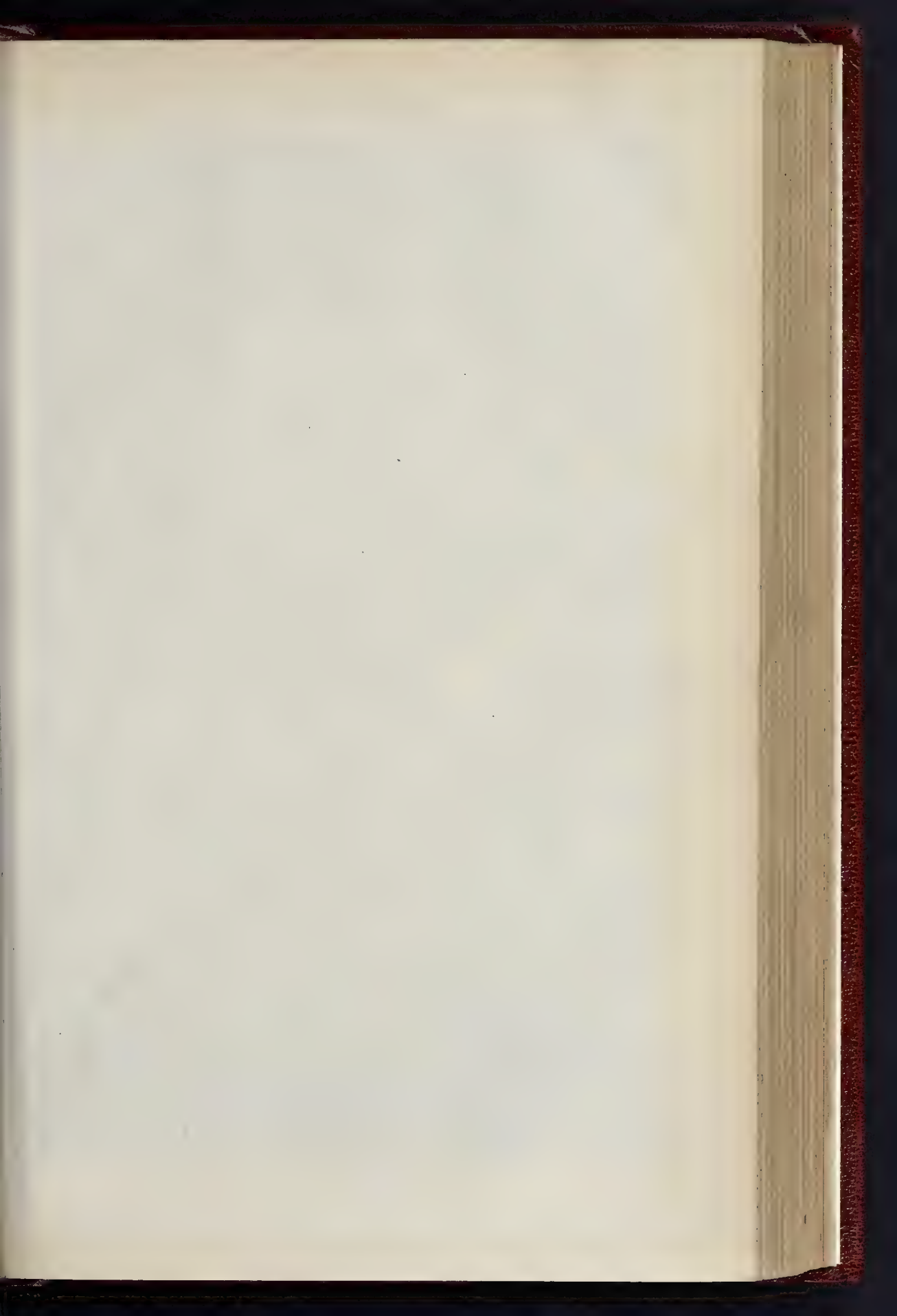
#### NEW LIBRARY AND MUSEUM, MELBOURNE.

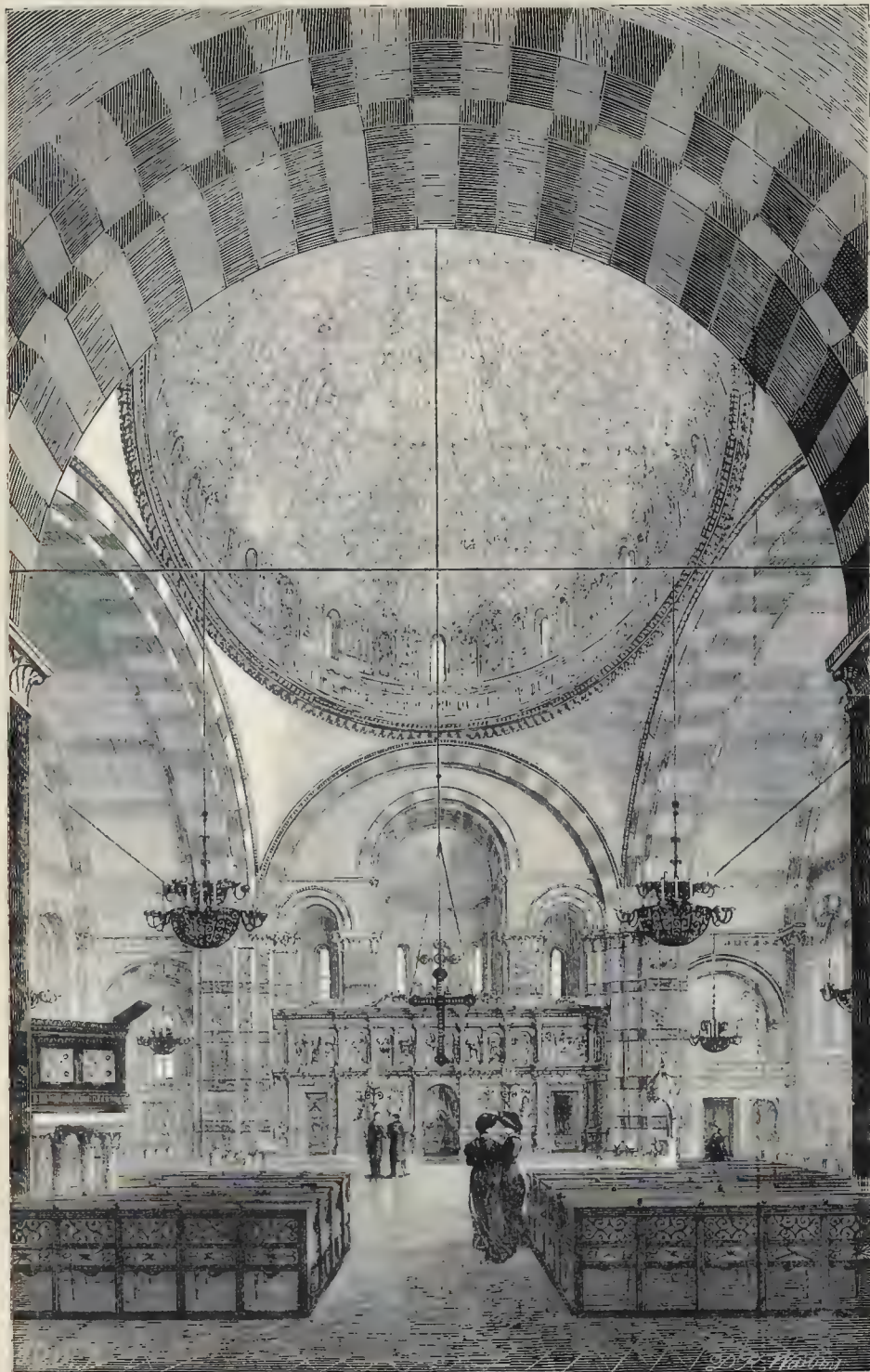
THE site of the library is a little way out of Melbourne. It is proposed by the donor to exhibit Australian works of science and art only. The library is to be free, as well as the museum. The cost of the whole undertaking will be borne by an Australian gentleman now resident in England, and the amount will be about 13,000l. Mr. J. Nathan Smith and Mr. John T. Doyle are the architects.

#### POST OFFICE, ORANIENBURGERSTRASSE, BERLIN.

UNDER the administration of Dr. Stephan, the present German Postmaster-General, much has been done to improve the architecture of post-office buildings in his country. This improvement has shown itself as much in the provinces as in the capital. But it is in Berlin that great changes have been effected. We illustrated recently the new General Post Office of that city. In this issue of the *Builder* we present a view of the Post-office buildings in the Oranienburgerstrasse, which serve the purposes of the parcel-post. The view of the buildings which we give speaks for itself; but we may add a few figures illustrative of the postal traffic of the German capital. In consequence of the rapid extension of Berlin, greater accommodation has had to be provided for the growing demands upon the postal service. Statistics have shown that there are 220,000 families in Berlin, and that, on an average, each household gets one letter and one book-parcel per day, each family receiving, besides, one parcel every three weeks. To meet the great pressure upon the capacity of the Berlin Post Office, eighty post-offices, three central offices, and one newspaper post-office besides pneumatic post-offices with six engines, have been established. Five hundred horses are necessary to carry the letters and parcels. Perhaps one of the most interesting buildings in connexion with the Berlin postal service recently erected is that which we illustrate.

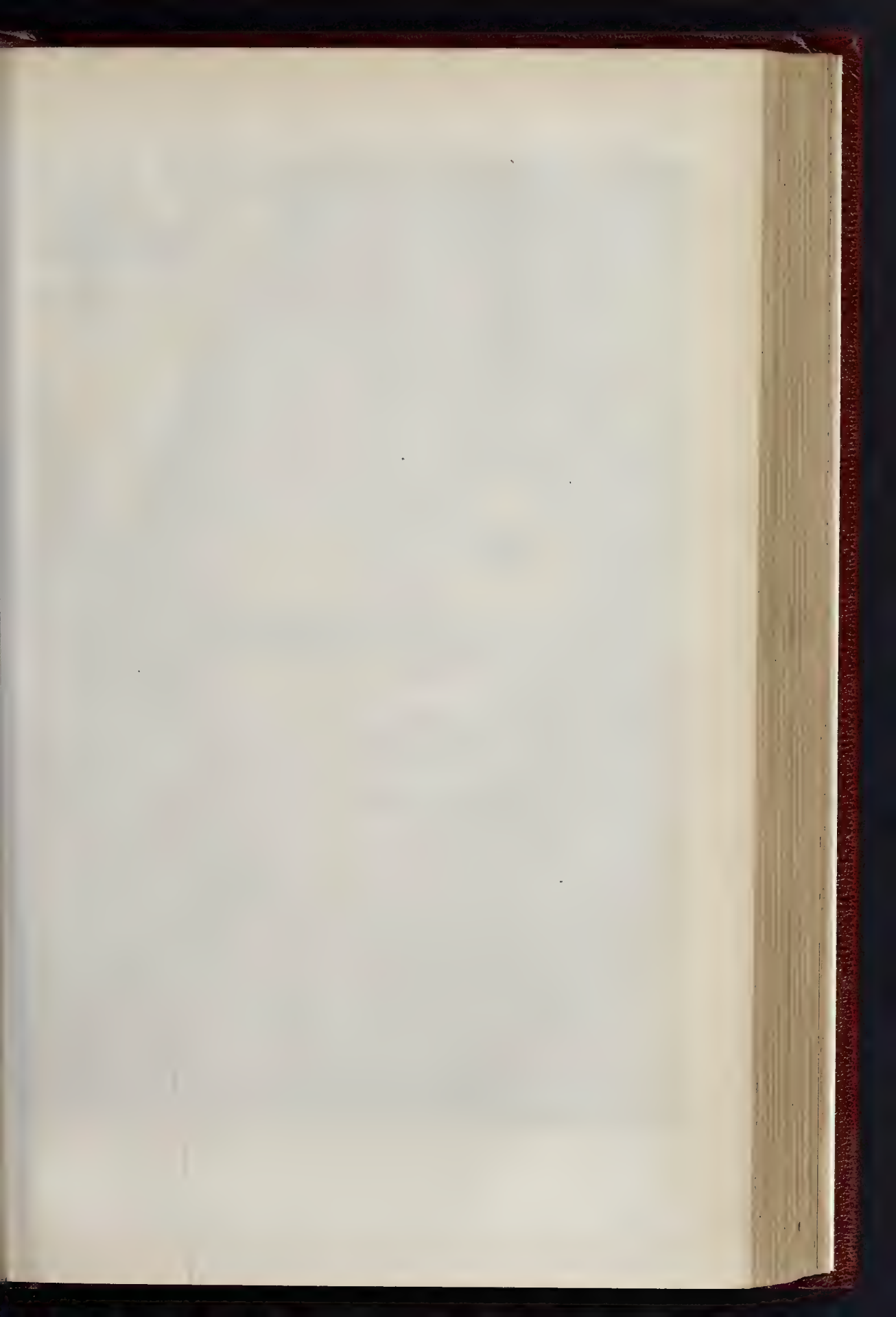






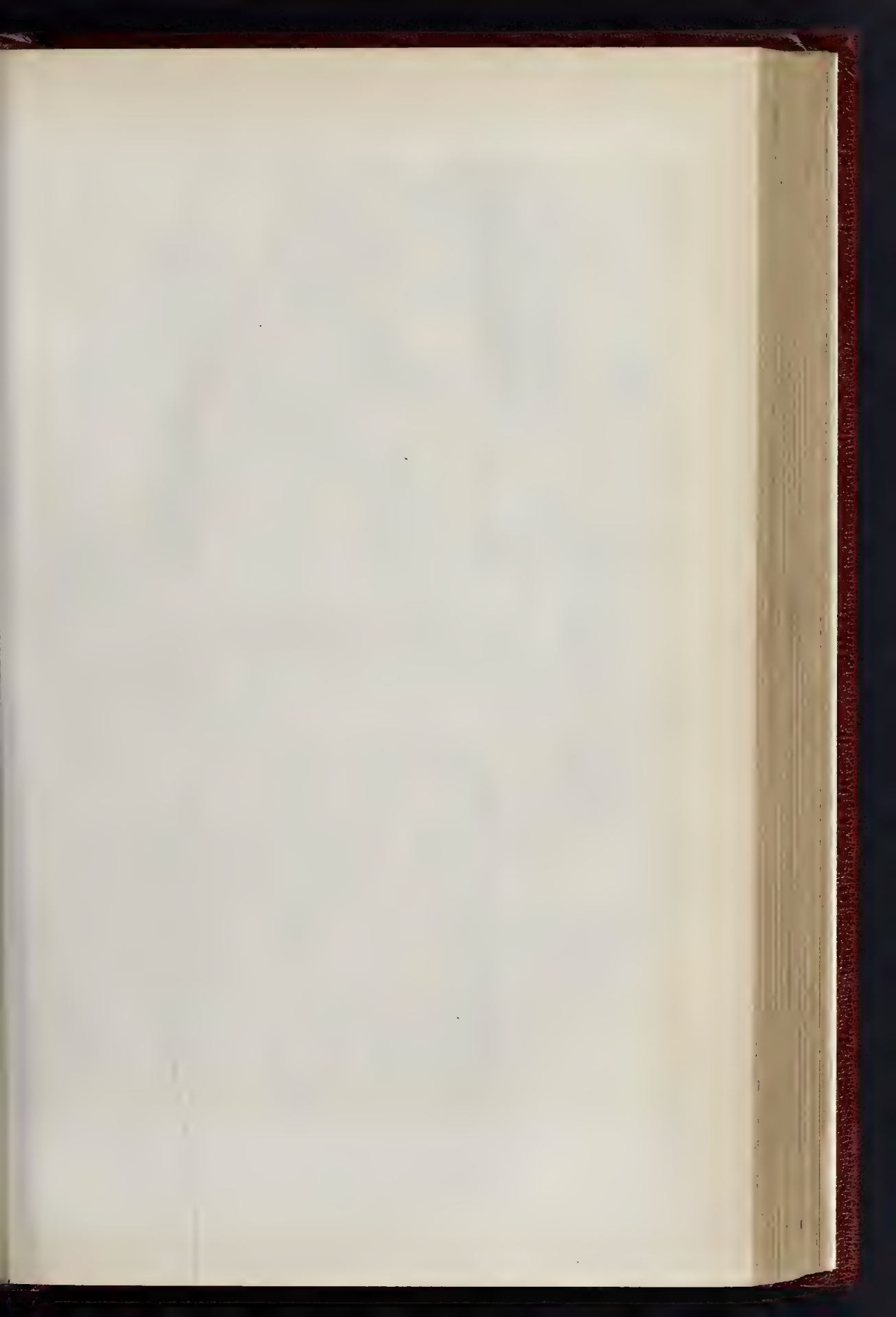
THE NEW CHURCH OF SANTA SOPHIA, MOSCOW ROAD, BAYSWATER.  
MR. JOHN OLDRID SCOTT, ARCHITECT.

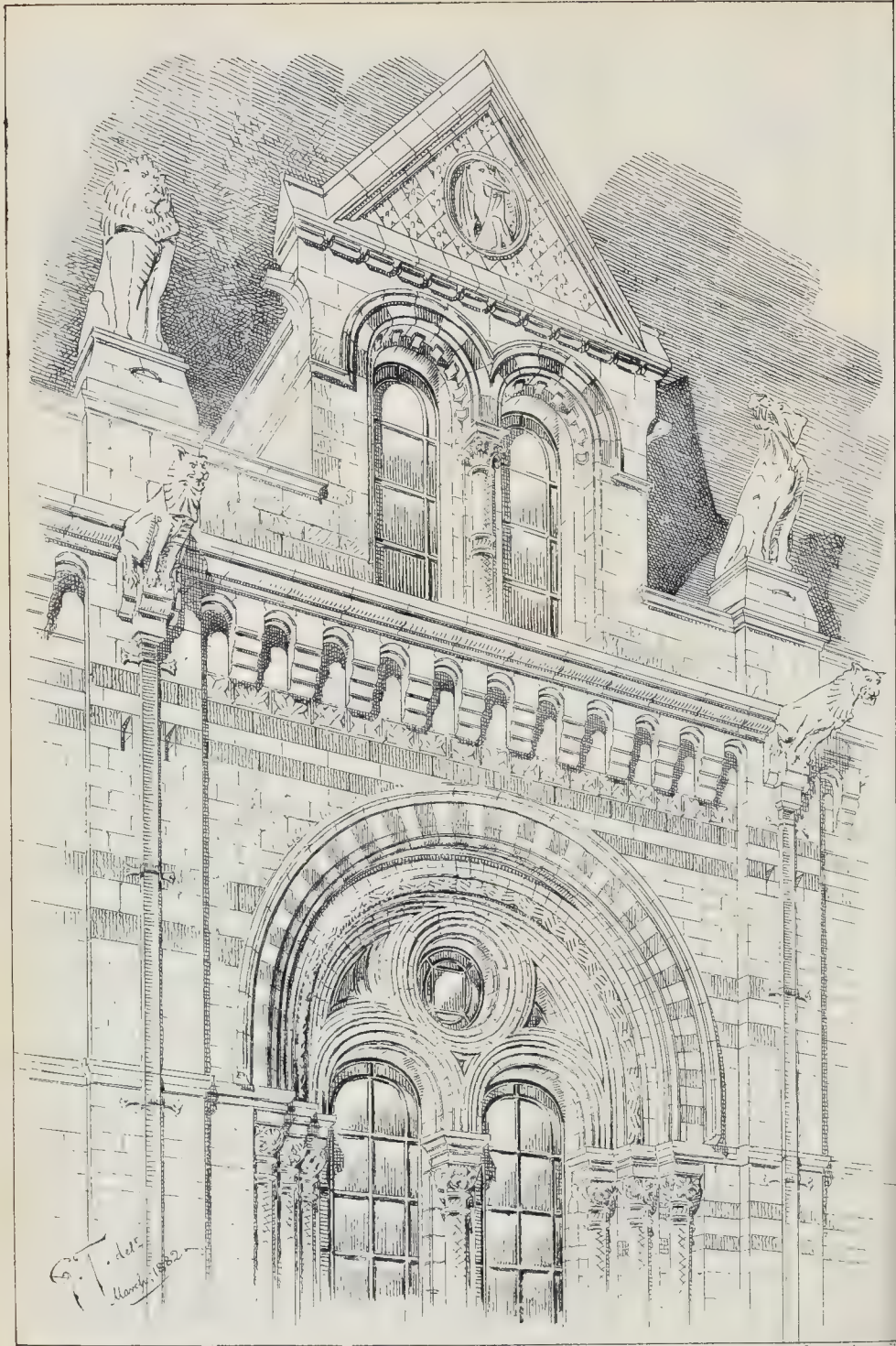




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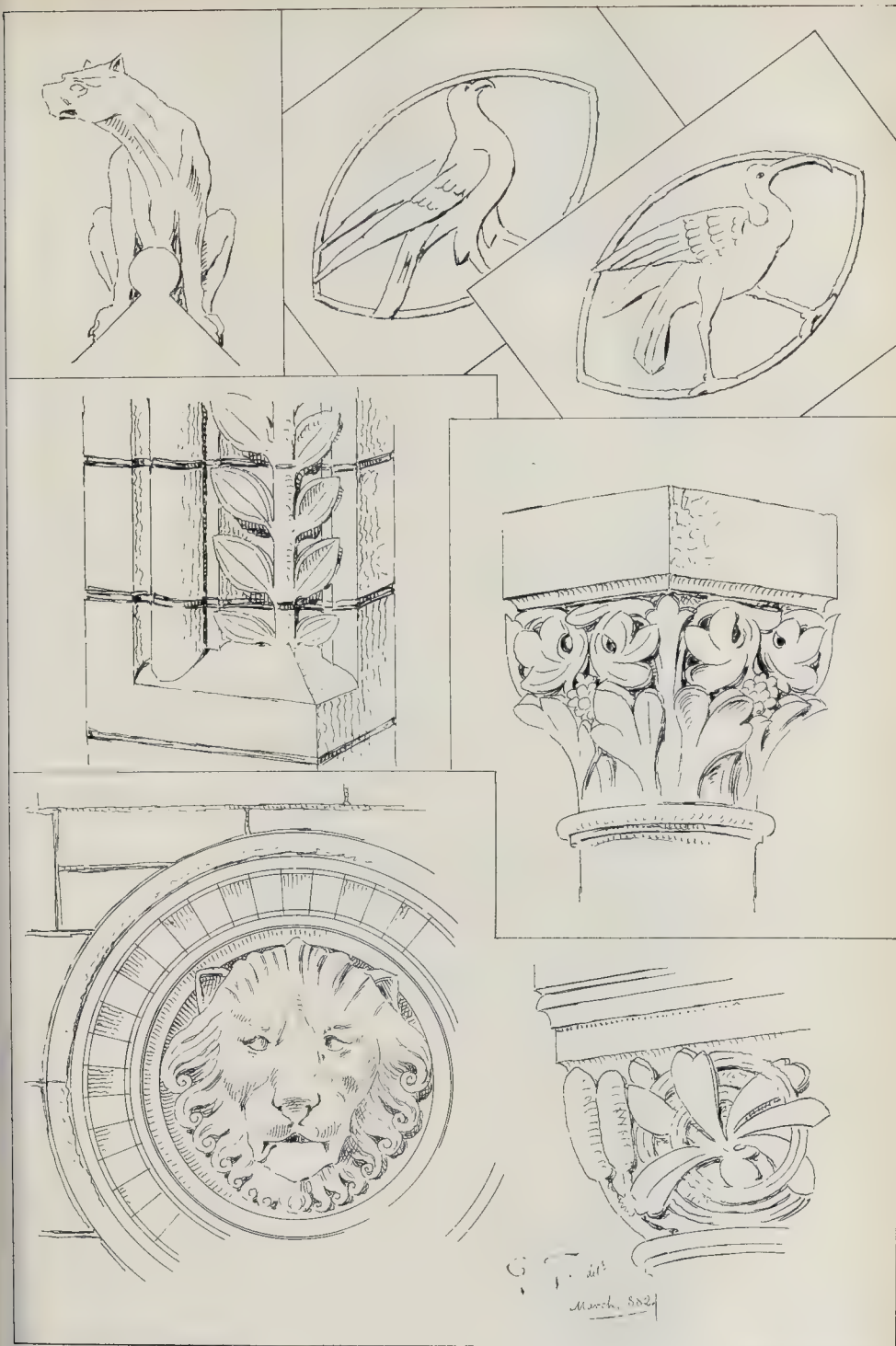




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SKETCHES FROM THE NEW NATURAL HISTORY MUSEUM, CROMWELL ROAD, SOUTH KENSINGTON.





SKETCHES FROM THE NEW NATURAL HISTORY MUSEUM, SOUTH KENSINGTON.













POST OFFICE, ORANIENBURGERSTRASSE, BERLIN.





## MONUMENTAL PAINTING.

The fifth lecture of the series given in support of the Society for the Protection of Ancient Buildings was delivered on the 23rd ult., at the Kensington Town-hall, by Professor W. B. Richmond, M.A., who took for his subject "Monumental Painting."

Previously to the lecture, which was copiously illustrated, Mr. R. S. Poole announced that Mr. E. J. Poynter, R.A., owing to pressure of work, had postponed his promised lecture on "Decorative Art" till Wednesday, the 5th of April, when it would be delivered in the theatre of the South Kensington Museum. On Thursday, the 30th ult., Mr. William Morris, M.A., was to lecture on "The Lesser Arts of Life."

The lecturer said that to deal satisfactorily with such a vast subject as monumental painting, and to follow it into the different fields of art to which it led, would be more than could be expected from a single lecture, for the many classes of painting which might, in the most comprehensive sense, be called monumental, covered the whole area of the history of art; they embraced epic, history, portrait, and landscape. Monumental painting, not immediately, but of necessity, connected architecture and sculpture with decorative painting, nor was it necessary that to be monumental in character a painting should be executed on the wall. Many works which might be cited were painted upon both canvas and panel. It was not with this comprehensive view they were then to occupy themselves. His remarks would be confined to a general review of the progress of painting from Giotto to Michelangelo, and, as during this period of time, almost all the works in painting were executed on walls, monumental painting in the sense of mural painting, would alone be considered. First, it was desirable to know the importance of art generally and of the influence of architecture upon both painting and sculpture, and to know how painting grew under the wing of architecture and sculpture, and how greatly she profited by contact with them.

Before Mr. Ruskin had opened their eyes to the beauties of early Italian art, the pedantic "brown tree" of the landscape-painter's traditions entirely governed what stood for taste. While the real expressive quality of early art was forgotten or passed unnoticed, whatever the conditions of nations, Mr. Ruskin, it must be acknowledged, had chastened the taste of England, and had greatly added to the love of natural beauty. There was no reason for any of them to remain ignorant concerning Italian art, or to be insular in their tastes, but rather should they endeavour to enlarge their sympathies and spread of ground, learning all they could from the other side of the "silver streak," and especially to study the severe work of the earliest art, for they had much to learn in that direction. The English school began, he (the lecturer) might say, with Hogarth. Nearly all the relations existing between the tempera pictures were destroyed at, or after the Reformation, so that then English painting received a check in decorative art from which she had not yet recovered; consequently, in painting England had no archaic traditions, and it had been influenced far more by the Dutch than by the Italians. In Italy, both fresco and tempera painting were the means of decoration when mosaic ceased. When the architect admitted more light into his building fresco took the place of mosaic. Fresco led to a noble style of work; it could not be done heavily, and nothing could be achieved by accident. Design, in all its branches of form, light, and shade, must be planned and ready before the fresco-painter could begin his work upon the wall, and very much of the dignified restraint of the early Italian art was due not only to the junction of the three arts, but to the precise and mathematical nature of the art-training which the process of fresco-painting demanded. This was a lesson of no small importance, for, whether the modern painter was or was not to be a mural painter, an education formed upon the severest practical lines would assist rather than retard his progress, whatever branch of the art he might choose to follow. Perhaps it was useless to hope that fresco painting, if only as an education, would ever be taught in their schools; but this was a pity to know, on account of the chastening and severe influence it had upon the art. Still, with all the aids there were, a section of the educated public was becoming larger, and the study of a severer form of art was more universal than it was. The dread of idolatry, the terror of Romanism, and

the cold hand of Pariticism, chilled the warm dream of art. For the most part their churches were caves or whitewashed sepulchres, uncoloured, or, if coloured at all, only in part, and such designs as existed were formed of mechanical colour. The plain duty of those who had a voice to be heard, and were desirous of the progress of the highest forms of art, was to use every opportunity they might have to appeal to the public frankly, and in that way to open their eyes to the great want, and, if possible, to excite them to action; yet, while so large a section of exhibition-goers were satisfied with the dreary commonplace platitudes of daily life, any future of true art in connexion with the deeper thoughts and aspirations of men appeared still far off. The works of the great masters should be the groundwork of education, and the austere and severest forms of each art should guide the earliest steps of the progress of taste, because they were always sincere without affectation, always untrammelled, and were always marked by modesty and spontaneity. The halting power of expression so easily discovered in them was full of charms. In all the arts the progress towards perfection was even more interesting and instructive than the moment of culmination. In order to comprehend the full development of art, they must follow her step by step from her childhood.

The architect, the sculptor, and the painter of Italy did not hold separate fancies; all the three arts were, in many instances, known by one man. Giotto, Michelangelo, and others, if they did not practise every art, were at least conversant with them, and were complete masters of two at least of the arts. That complete union which existed from the earliest times of architecture, sculpture, and painting, led indeed to the maturity of the noblest characteristics of each art by the habit of mutual constraint. The three grew together; they demanded no single reward or individual praise, but they were content that perfect beauty was found in their combination. True art found in them one common pulsation. In the strict sense, monumental painting was connected with painting and sculpture. In the childhood of its career the forms were scarcely more than emblems, but they were the expressions of the minds of men in the hands of children. Monumental painting of that day depicted the march of man's life, his noblest feelings, and the highest hopes of his soul. Not only in form, but also in the treatment of colour, the Italian monumental painters excelled; they showed delicacy of perception, calm reflection, and harmonious execution in their works, this being brought about by the union of the three arts. The greatest painting was that which had in it the influence of architecture and sculpture, and yet had not been robbed of the essential elements of it alone. In the frescoes of Giotto they were brought face to face with the natural truth, which was deep below the surface of the work. There was not only the perfection of the story, but there were justice and clearness. The art of Giotto was the outcome of Greek tradition drafted from the Italian spirit. As long as the simple art of Giotto was paramount science was held in check. Those who studied art, and who would become conversant with her limits and her true boundaries, must feed upon the earliest expression of the mind of the greatest painter who ever lived, whose shortcomings were only the shortcomings of science, whose work was clear in invention and absolute in taste, whose colour was quite perfect, and, above all, whose noble design was unsurpassed in art. No hasty observer could properly understand his work, which was essentially to be deeply studied. It was childlike in expression and robust in thought. When all the stories were made out, when every motive was understood, and when every figure was clearly followed, then there remained the physical beauties to be studied, which had been little recognised. In the representation of the hair and drapery Giotto was remarkable. In all his designs there was not to be found one simple straining after artistic effect. There was no touch that was done by the rule of thumb. His work might be compared to Greek art; it was in perfect accord, and there were no more beautiful designs to be found in Italy than those of Giotto. In decorative art there were no purer works. He attained perfection in expression up to a certain point; beyond that he could not go, and the natural restraint imposed was rather an advantage to him than otherwise, only later expressions of motion and attempts at mobility

became more apparent. It might be said that after the death of Giotto the art of painting progressed but very little; no painter arose who could rival him. He stood quite alone; he was at the end and at the beginning, and his works would stand by the frieze of the Parthenon. All really great art had a kinship, and, as it had been said, true art would not materially suffer from juxtaposition. Art having been pretty nearly perfected as a pure sentiment, it remained feeble; it had to extend its field in the observation of nature, and to concern itself with the knowledge of nature's laws, so that each painter who followed Giotto kept on adding to the general knowledge; consequently art advanced with rapid strides. Amongst the three most important painters who followed Giotto were Leonardo da Vinci, Michelangelo, and Raffaele, all of whom were distinctly different in genius, and each one, according to his own special gifts, arrived at perfection. Of the works of Leonardo da Vinci, they knew comparatively little as compared with the complete works of Raffaele and Michelangelo. The name of Leonardo da Vinci as a painter had a spell about it and excited the imagination, but it might be said that no work existed by which they could test Leonardo da Vinci as a mural painter. His famous work was the "Last Supper." In regard to Michelangelo, his great cartoon, representing a scene in the wars with Pisa, came on the world as a miracle, and it was accepted as the greatest achievement of modern art. Then he painted the vast ceiling of the Sistine Chapel, which was the perfection of monumental painting. In the history of art this work stood alone in conception, in limitless invention, and in the mystery of its execution. In it the severe and early art of Giotto was not departed from, but rather adorned by Michelangelo. Raffaele, with all his grace, never touched the chord of a mother's love like Michelangelo, as depicted in the groups represented in the spandrels of the roof of the Sistine Chapel, where they saw men, women, and children depicted in their perfect purity and highest beauty. In the presence of such a work one must bow, and criticism respectfully keep silent, except to appreciate. In looking back, they saw that with Giotto a new art began, and ended with Michelangelo, but with that end the death-knell of monumental art was sounded, and the influence of the sister arts one upon another ceased; for when the breath left their bodies, all that was truest in monumental art in Italy slept.

## BUILDING NOTES FROM THE WEST.

The building trade in the West of England remains unchanged. Amongst the works now noticeable are the following:—

Holy Trinity Church, St. Philip's, Bristol, presents a greatly improved appearance since the recent alterations. In the west porch, the dead wall between the outer and inner porch has been replaced by three light archways, which give greater convenience for ingress and egress, and also render the inner porch much lighter. The flooring of the church is entirely new, and open pitch-pine seats take the place of the old high-backed ones. The gallery front has been reduced in height, so that those in the back seats can see the preacher; and alterations have been made in other parts of the building, adding to its convenience and attractiveness. The windows have been reglazed with rolled cathedral glass in effective designs. The windows have been attended to by Mr. Ben. Gay, Bristol; the lighting arrangements and metal work are by Messrs. A. G. Williams & Co., Bristol; the new brass lectern was made by Messrs. Jones & Willis, of Birmingham; the decorations of the east end of the church are by Mr. John Powell, Bristol; and the rest of the work has been carried out by Messrs. Stephens & Bastow, Bristol. Mr. John Bevan was the architect. The church now accommodates 1,500 persons. The work cost nearly 2,000l.

New schoolrooms have just been added to the Victoria Wesleyan Chapel, Clifton, at a cost of 1,200l. The work, which was executed by Mr. William Church, of Wapping, Bristol, is in keeping with the design of the chapel. The windows are of fourteenth-century design, and glazed with tinted cathedral glass, by Messrs. Bell & Son, of College-green.

The warehouse that has been erected by Messrs. Howell & Son, from the designs of Messrs. Foster & Wood, for the well-known firm of Messrs. Budgett, cannot fail to be noticed by



any one passing through Bridewell-street. The building stands on part of the site of the old City Bridewell, which was demolished a year or so ago, and it covers a piece of ground, 120 ft. long, 60 ft. deep at one end, and 56 ft. at the other. It is of the most substantial construction, the outer walls, which are 3 ft. 6 in. thick, standing on a concrete foundation, 6 ft. deep. The walls are of Pennant, with Bath and Ham-hill stone dressings. The structure, though no great attempt has been made to ornament it, is imposing in its massive fitness. It is 64 ft. high, and the numerous lofts are floored with boards, 3 in. thick, each being grooved at the edge to admit of a galvanised iron tongue being driven between them. The flooring rests on strong iron girders, supported by iron columns. One end of the warehouse still remains to be finished.

The Bristol Athenæum Reading Hall has been improved and re-decorated by Messrs. Thomas & Son, of Clifton. The decoration is in good taste.

Messrs. Wills & Co. have placed in front of their handsome factory, in Redcliff-street, a double-faced illuminated clock, regulated by electricity from Greenwich. The number of clocks so regulated in Bristol is increasing rapidly.

A memorial window to Mrs. Lucas, who died on June 10th, 1880, has been added to the stained glass of Bristol Cathedral. The south window of Newton Chapel, which consists of four lights and tracery, has had introduced into the lights a subject-panel, the groups being arranged to represent the six acts of mercy. The window is by Messrs. J. Bell & Sons, of College-green.

The enlargement of the West of England Sanatorium, Weston-super-Mare, is progressing satisfactorily in the hands of Mr. A. J. Beaven (Bristol), the contractor. The institution was opened in 1868, and the first patients were received not in the building now standing, but in a house standing on its site. In 1870 the central part and south section of the permanent building were begun, and the work now being done is for the completion of the structure. The section being added will give accommodation for fifty patients. The building is Gothic in style, and in the front there are three central gables with recesses, of which advantage has been taken by the architects, Messrs. Hans Price & Wooler (Weston-super-Mare), to provide covered verandahs in order to give a sheltered promenade in wet and cold weather. At the north and south two wings are projected containing the dormitories for men and women. On the north side a noticeable feature will be a square tower surmounted by a pointed lantern roof, with ornamental finials.

The designs of Mr. Herbert J. Jones (Welling-ton Chambers, Bristol) have been accepted for the erection of a new Wesleyan chapel and minister's residence at Clevedon.

The Baptists of Salisbury have just opened Brown-road Chapel, which has been built at a cost of 8,000l.

Amongst the churches which are about to be or are receiving attention in Devon and Cornwall, may be mentioned the following:—A church is designed in the parish of St. Endellion, near Wadebridge, to accommodate 214 persons, all seats being free. The cost is estimated at 1,172l. The Church of St. Mary, Callington, built A.D. 1400, which underwent extensive repairs in 1857, is to be enlarged by 150 additional sittings; the cost has been estimated at 1,127l. St. Morwenna, Morwenstow, North Cornwall, is being restored gradually; the nave and roof are finished, and the interior is now in hand. A mission church is to be erected at Kenaye, near Truro, at a cost of about 200l. It will provide room for 100 persons. A somewhat similar building is designed for St. Allen, near Truro; the cost will be about 230l.

Christ Church, Clevedon, is to be re-seated and improved at a cost of 500l.

Considerable improvements have been effected at Holy Trinity, Stroud, and the chancel has been decorated by Messrs. Stansell & Son, of Taunton.

The building known as the Tolzey Hall, Tewkesbury, which was formerly a Wesleyan Chapel, has undergone alterations, and has been opened as a Temperance Hall.

The scheme of church extension in Bristol, which embodies the erection of several new places of worship, and the enlargement of others, has already received contributions in aid amounting to nearly 20,000l.

#### ARTISTS' BENEVOLENT FUND. ANNIVERSARY DINNER.

THE seventy-third anniversary dinner of this Fund was held on Saturday evening last at the Freemasons' Tavern, the Right Hon. W. H. Smith, M.P., in the chair. There was an unusually large attendance of members and friends.

The usual loyal and patriotic toasts were given and enthusiastically received, the chairman referring in appropriate terms to the recent happy deliverance of her Majesty the Queen from serious danger, and to the valued appreciation which her Majesty (the patroness of the Fund) and the other members of the Royal Family gave to art and artists.

The Chairman, in proposing the toast of the evening, said,—We have now approached the serious business of the meeting, and it is my duty to ask you to drink the toast of "Prosperity to the Artists' Benevolent Fund," coupled with that toast the names of the president and vice-president of the Fund. Ladies and gentlemen, what are the objects of the Artists' Benevolent Fund, and why is it that we are here met together to endeavour to promote its interests and its success? In the first place, I will venture to say what its objects are not. It is not a fund which is intended for, or which will contribute in the slightest degree to, the support of any member of the Artists' Annuity Fund as such. The artists who are the members of the Annuity Fund do not, on any consideration or at any time, appeal to the public, or to those who are called the "patrons" of the fine arts,—I think the term is an unfortunate one, and I will presently say why I think so,—for any assistance for themselves. They have provided for themselves by a system of insurance, by a provident fund of their own; but they do appeal to the public, and I heartily support that appeal, for help for the widows and children of their brother-artists, who, overtaken early in life by unforeseen calamities, such as prolonged sickness, may have passed away without having had the opportunity of making the provision they would have desired for those near and dear to them. Now, ladies and gentlemen, speaking in the highest sense of the word from an economic point of view, I say that I do not think it possible for anybody,—however strongly he may hold it to be the duty of every man to make the greatest possible efforts to provide for those whom he may leave behind him,—I do not think it possible for anybody, even the most stringent economist, to object to the work which this Artists' Benevolent Fund is doing. I need not tell you, for you all know it, that sickness and death may overtake a man before it has been possible for him to make provision for his family. And when you come to consider the peculiarities of the profession of the artist,—I am not one myself, but I think, on that account, I most appreciate those peculiarities,—when you consider that an artist must be, and usually is, a man of a fine temperament, and of considerable powers of imagination, and with tastes which would tend, in the first instance, to disqualify him for the pursuit of the ordinary business engagements of life; and when you consider that in order to be successful in his profession he must have studied long and carefully,—must, in short, have passed a long time in qualifying himself to succeed in delighting those who may become possessors of his works,—you will see that this Fund has great claims upon us. Artists contribute greatly to the purest enjoyments of our life, and we are, therefore, largely dependent upon them for our happiness. When we consider the care and study which the artist must bestow in order to qualify himself to contribute to our happiness, we perceive at once that, before he really enters upon his career, he must often devote to mere preparation for work a period of time which, in many other walks and operations of life, would afford him opportunity for making provision for his family. That is one ground, then, on which I think the public may reasonably be appealed to to assist the families of artists who are overtaken suddenly and disastrously, and often comparatively early, by death and misfortune. But there is a characteristic feature of the artist's mind which has always appeared to me to render him in some degree disqualified for the active pursuit of those profitable engagements, and that is, imagination. It is the imagination of the artist which delights us as we look at its results in the creations of his art; but the artist's imagination in the early part of his career is often the very reverse of profitable to him. He

may at last arrive at competence and success by the perfection of his capacity to realise, embody, and perpetuate in his works the ideas of his imagination, but only after a long process of thought and study,—a process which has not been a profitable one to him while it lasted;—therefore he remains poor and unable to make provision for his family until long after the period when men in other professions are generally enabled to make such provision. I appeal to you on behalf of this fund as a lover of the fine arts, for I do not feel myself qualified to speak as a "patron" of art and artists. I said just now that I regret the use of the term, as I think it implies the existence, between artists and those who buy their productions, of relations which are not of the most agreeable or satisfactory character. It does not at all correctly express the position in which we stand to each other. I and my friends on both sides of me are indebted to art and artists for much,—very much indeed,—of the enjoyment and happiness of our lives. I remember very well that when I was a boy the first money I possessed I devoted to the purchase of a water-colour by Topham, which I hung up at the foot of my bed, and when I returned home at night, after working hard all day, the picture seemed to look down upon me and shed a pleasant influence over my soul, and I went to sleep soothed and happier than I should have been but for the work of the artist. The picture, indeed, seemed to be a guardian angel hovering near me. I have retained that picture through many years and through many vicissitudes and changes, and I now possess other pictures, some of which are specially valuable to me for the influence they have exercised over my temperament. I am thankful and grateful that they exist, and am thankful to the artists for the skill, the imagination, the thought, the care, and the sympathy they have brought to bear in their works,—qualities which have appealed to me in a thousand different ways, and have influenced my life and character in a manner and degree which are almost unknown to me. On my part, then, there is no assumption of the character of "patron" of artists. On the contrary, instead of artists being under obligation to me, I feel deeply indebted to them, not only on account of the influence which their works have exerted on myself, but for what they have done, and are doing, by their art in refining, soothing, and elevating the community amongst whom we live. Well, then, ladies and gentlemen, shall we not, under these circumstances, enter into the joys and sorrows of artists? Shall we not soothe the last moments of the artist who, just as he appears to be on the threshold of fame and competence, is struck down before he has had opportunity to make the provision he would have wished to make for those who are very near and dear to him? Shall not the last moments of such a man be soothed by the conviction that this Fund will shield his widow and children from absolute want? That is the beneficent work which is done by the Artists' Benevolent Fund. It is not extravagant in its grants. The provision it makes is very modest, but it is a provision made largely by the kindness and sympathy of artists who, in their prosperity, are ever ready to assist those of their brethren who have been less fortunate than themselves. But they cannot do all, and it is our privilege, as well as our duty, to help in the good work. I appeal to you, then, ladies and gentlemen, for your assistance. As we have done in the past, so now and in the future, we shall, I feel sure, heartily support this Fund, not from any feeling of patronage, but from a sense of the duty which we owe to our neighbours, from sympathy with suffering and distress, and because of the real pleasure which is afforded by contributing, as far as we can, to alleviate the sorrows and assuage the trials of artists, to whom we all owe so much.

Mr. John Absolon, chairman of the Committee, responded, and the results of the appeal was subsequently announced by the secretary, Mr. Lambton Young, to be a total of 800l., which included her Majesty's forty-third annual donation of 100 guineas, and 55 guineas contributed by the members of the Artists' Annuity Fund.

The Right Hon. the Lord Mayor proposed "The Royal Academy," coupled with the name of Mr. C. B. Birch, A.R.A., who briefly replied.

The Right Hon. H. Cecil Raikes proposed "The Artists' Annuity Fund," for which Mr. Arthur Willmore, the president, replied, re-ex-



ring to the sound financial position of the Fund, and urging all young artists to help themselves by becoming members of it.

During the evening there was some excellent singing.

#### "THE DESCENDANTS OF THE RENAISSANCE."

IN the discussion which followed Mr. Stannus's lecture before the Architectural Association on this subject (see p. 365, *ante*), the Chairman (Mr. Aston Webb) said he could not help regretting that Mr. Stannus had confined his attention to what was bad rather than to what was good in the "descendants of the Renaissance." A large number of the illustrations which he had adduced were examples to be avoided rather than followed. The lecturer also seemed to congratulate himself and his audience that the debased detail of which he had spoken had now altogether died out, and that architects were now quite prepared to start afresh and to produce works in the pure Renaissance style which should be thoroughly creditable to them. Unfortunately, Mr. Stannus was a little too sanguine with regard to the matter. If the Renaissance style was to be revived, it must be used with great severity, and architects must put bridles on their pencils. Mr. Stannus need not have apologised for the fact that the illustrations which he had adduced rather appertained to decoration than to building, for in his (the Chairman's) opinion, the Renaissance was seen at its best in matters of detail rather than in large masses of building. If, as they were told, the style of the Renaissance was about to "come in," it would not succeed unless it could be used for buildings either in stone or brick, and only by the exercise of great thought would buildings be produced in it which would be remembered, and add to the renown of the present century.

Mr. Gilbert R. Redgrave, in proposing a vote of thanks to Mr. Stannus for his lecture, observed that Mr. Stannus had confined his remarks to the Renaissance of two countries alone, *viz.*, France and Italy: both of them, it was true, countries in which the Renaissance had been very fully developed. In England the Renaissance was very late in the field. The first work which gave us any idea of the style as it was understood here was the "Architecture" of John Shute. That book abounded with the ornaments and debased scrollwork with which Mr. Stannus had found fault. During the past year he (the speaker) had occasion to travel in the South of France, and he had seen a great deal of the work there. In Toulouse there were several important buildings supposed to be by Primaticcio, or by French architects trained under him. Those buildings included a palace built by the Duchess of Savoy. It was, on the whole, very pure in style, though here and there it showed traces of what Mr. Stannus evidently regarded as the Evil One in the form of little curls and scrolls. In Toulouse were also to be seen later specimens of the style by other architects. In the hands of some of the architects of other countries who succeeded the first masters of the Renaissance, the decadence was much more rapid than was the case in France and Italy. Everybody knew how Renaissance architecture was treated in Portugal, *viz.*, after the manner of goldsmiths' work. Mr. Stannus had alluded to the ornaments to be found in early, though not the earliest, printed books. No doubt the printers were great sinners in the dissemination of bad ornament in the form of tail-pieces, &c., and as printed books began to multiply very rapidly towards the end of the fifteenth century, they were probably as much to blame as architects and decorators for the inoculation of false principles of ornament.

Professor Kerr said he had listened with pleasure to Mr. Stannus's lecture. It struck him, in looking at the very suggestive examples which were hung upon the wall, that young architectural critics and students might be usefully reminded that there was a distinction to be drawn between architecture and modelling. Architecture was essentially constructive, and its ornament, which had to be developed in an architectural way, properly so-called, had to be, not constructed, but involved in the construction and made to arise out of it. They all, as architects, more or less understood the application of that principle generally, if not always in its minutest detail. Modelling, on the other hand, was obviously a thing quite independent of con-

struction. It was based upon the idea simply of "pleasing the eye,"—if he might use that expression, which, scientifically, was a very loose one,—or of "pleasing the taste" (which was an almost equally loose expression) by means of beautiful forms. The architect had to confine himself, as regarded his aspirations after beautiful forms, strictly within the limits of his construction, and to see that the articulation of his work was strictly discernible. But the modeller was controlled in no such way. He had simply to throw together, not produce, such a collection of beautiful forms as would please, or amuse, or gratify the senses of those who wished to be pleased, amused, or gratified. Bearing that distinction in mind, it was very easy to understand that all the objectionable features of the debased Renaissance which had been enlarged upon by Mr. Stannus had been founded strictly upon the idea of modelling, without any reference to the principle of architectural construction. To carry the distinction a step farther for a moment, he would consider the difference between the criticism of the architect and the criticism of the non-architect, or, in other words, the criticism of the architectural profession in this country and the criticism of the public of this country. Now professional architectural criticism endeavoured to arrive at principles and rules of practice which should be constructive,—strictly, sparingly, and rigidly constructive. He granted that exceptions to this were pretty numerous, but nevertheless, most critics adhered to the line he had indicated, and the need of showing the articulation and mode of construction of a building had always been dwelt upon in modern times by the best critics. But that was not at all the principle upon which the public criticised a building. They asked themselves: "Does the architect's work please the eye?" (He was obliged to repeat the expression, in all its looseness and vagueness.) The public did not understand the principles of architectural construction, and the language of articulation in architectural design was not even a dead language to them: it was a language which had never lived, and which they could not understand in any way. How, then, were architects to expect the public to appreciate those delicate principles of articulation upon which they dwelt as essential to their work? There were those who were studying architecture with the intention of practising it, and possibly with the intention of introducing a new school. Well, he thought the time had come for a new school, and he thought the change was impending, but those who hoped to be the ministers of the new régime in architecture ought to be warned of the distinction between the taste of the architect and the scholar and the taste of the public at large. The question was to which division was the architect to bow? There were men in the present day, as there always had been men, who would accept the public taste, for better or for worse, for the sake of that personal prosperity which was ephemeral, when they might acquire fame which would endure. In plainer language, there were men who would "trim" to the public taste, thereby compromising and sacrificing their intellectual position. What, then, was to be done? The public were the masters, and the public must be pleased. Mr. Stannus told them that Renaissance architecture was now pressing its claims to consideration on the part of modern English architects, and that the immediate future of architectural design was to be very largely identified with the renaissance or re-adoption of Renaissance in some form,—it was to be hoped a good form rather than a bad one. Now, he would try to look at the subject rationally, and would not harp upon the "Queen Anne" style any further than was necessary, but it was of no use to ignore the fact that the "Queen Anne" style, which had made itself so prominent of late, was an evidence, very clear and distinct, of the precise condition of the architectural mind at the present time. It was not to be taken as an abnormal manifestation of taste on the part of architects, but rather as the deliberate expression of the desire of architects to acquire popularity by trading upon a perverse taste which had taken possession of a portion of the public. It was a public of the higher class, but, at the same time, a public composed of a very insignificant and frivolous class. That was the conclusion at which he had arrived, and if any young man were to ask him to tell him frankly whether it was worth his while, having

regard to chances of future prosperity, to constitute himself, by any long and painful study, an expert in the "Queen Anne" style, he should be obliged to tell him that he did not think it would be worth his while. But he still said, as he had been accustomed to say, that he regarded the "Queen Anne" style as a stepping-stone towards the adoption of a better form of Renaissance. Architects had been accustomed to cultivate the picturesque in their work in the Gothic styles, and they had cultivated it with very remarkable success. He was not one of those who would decry picturesque, but he should be inclined to urge young architects to cultivate the quality of reticence in design a little more than some of them did. Reticence, modesty, and sobriety, of judgment, were amongst the highest qualities of Classic architecture, as they were also amongst the highest qualities of Gothic work. It was a mistake to suppose that Gothic architecture must be all irregular spikes and corners, giving to a whole building the effect of having been turned out at random. That was not the case in the best examples of Gothic, which exhibited symmetry wherever symmetry was possible, and never showed any straining after effect in the shape of picturesque-ness. In conclusion, the Professor said he had much pleasure in supporting the vote of thanks which had been moved to Mr. Stannus.

Mr. Lewis F. Day said that Mr. Stannus had, no doubt correctly, traced the fall of the Renaissance to the introduction and growth of what might be called the "curly-whirly" element; but the evil was not peculiar or fatal to the Renaissance alone. The same influence had brought ruin on other styles. Gothic art had died simply through being frittered to death. All styles in their beginnings were restrained and severe. That was certainly the case both with Gothic and Renaissance, and therefore one thing quite certain was that the cause of their decadence did not lie in the styles themselves. The cause was rather to be looked for in the people who used the styles. A luxurious, not to say licentious, age, would be characterised by exuberant ornamentation. He did not share Mr. Stannus's faith in the middle classes as judicious patrons of architecture and art.

Mr. H. L. Florence said that in criticising the works of Primaticcio, it should be remembered that Primaticcio was not an architect at all, his work consisting mainly of decorative design. The unfortunate little volute which had been abused as the cause of so much mischief in architecture had been employed by Primaticcio purely as a matter of decoration. He thought it was as unfair to condemn the Renaissance because of the decorative details which Mr. Stannus had chosen for his illustrations, as it would be to judge of the character of Roman architecture by the painted decorations found on the walls of Pompeii.

Mr. A. B. Pite did not believe that we were shortly to see in this country a revival of Renaissance architecture. He based his belief on the views of the young men in the profession, who, in his opinion, by holding aloof from the Queen Anne mania, showed themselves to be possessed of more wisdom than their seniors. He had not great hopes of the middle classes as patrons of art, but he should like to see established a competent Ministry of Public Taste.

Mr. Stannus, in the course of his reply to some of the points raised during the discussion, said he had purposely chosen to speak of detail because decadence showed in that before it did in the main forms. He did not object to "curly-whirly" so long as it was merely decorative in a panel; but when the disease attacked the mouldings and stiles (*i.e.*, when it showed itself in the construction), he considered it bad, and condemned it as leading to subsequent debasement.

#### Manchester Academy of Fine Arts.—

At the quarterly meeting of the Council of the Manchester Academy, held on Tuesday evening at the Royal Institution, Mr. John Henry Lecherbrow, Mr. Arthur Wasse, Mr. Eyre Walker, and Mr. William Artingshall were elected members. Mr. Byron Cooper was elected an associate architect, and Miss Mary Hodgson was elected a lady exhibitor of the Academy. The treasurer reported that the total value of the works sold at the recent exhibition was 1,627.



## THE HYDE PARK CORNER SCHEME.

It is satisfactory that there appears now to be a real probability of the long-talked-of improvement of Hyde Park Corner being carried out at no very distant date. Objections of one kind or another may present themselves, no doubt, in regard to any proposed plan for getting rid of the throttling of traffic which has long prevailed at this point, and we will not say that the plan brought forward by Mr. Shaw Lefevre is not open to criticism; but he appears, at least, to be in earnest in the endeavour to get the matter settled, and may claim the merit of having propounded a definite scheme and named a definite price for it, by no means extravagant if the scheme prove satisfactory. The tone with which his proposal has been received in the House and in various quarters in the daily press may be taken, however, to be partly inspired by satisfaction at the prospect of getting something actually done, and need not be taken as implying that the scheme is not capable of amendment. There is still time for reconsideration of details if this should seem desirable; and we may suggest one or two points as to which caution and deliberation may wisely be exercised.

Mr. Shaw Lefevre's scheme is to cut off a portion from the Green Park, not so considerable as to constitute any spoliation of the park, but sufficient to allow of a road extending with a gentle sweep, rounding off the north-west angle of the park from opposite Hamilton-place to the point opposite Halkin-street. This will lay open a nearly triangular space opposite Hyde Park-gate and Apsley House and the adjoining houses. This space is to be laid out in enclosed flower-gardens, leaving between them and the Green Park the road already mentioned, by which the connexion between Park-lane and Piccadilly and the Grosvenor-place district will be maintained without the necessity of going up to Hyde Park-corner; the line of road straight from Grosvenor-place to the Park entrance will be maintained, but widened; the sharp curve at the top of Constitution-hill will disappear, this part of it being thrown into the proposed place, and the line from the straight portion of Constitution-hill will be carried up in an easier sweep, between the parterres, to meet the straight road opposite Hyde Park Gate. The Wellington Arch is proposed to be taken down and rebuilt at the top of the straight line of Constitution-hill, standing at about an angle of 45° with the present position of the arch.

In the model which was placed in the tea-room of the House for the inspection of members, the scheme looks pretty well, and provides ample amount of roadway for the three different traffics; but when we in imagination place upon it the three moving streams of traffic, we at once see that the private and privileged traffic down and up Constitution-hill will have to run the gauntlet of crossing at right angles what will be the principal,—or, at least, the most crowded,—line of traffic along the sweep of the new road connecting Piccadilly with Grosvenor-place and Pimlico, which will be an omnibus as well as a carriage route. This is certainly a defect to be avoided if possible. But a more serious deficiency, and one which seems to have been quite overlooked by those who have criticised the plan, is, that although the block at Hyde Park-corner itself will be relieved, the block (which is nearly as constant and as inconveniently felt) at the foot of Hamilton-place will be scarcely touched by the alteration. There will still be the difficulty experienced from sending one great stream of traffic, from Pimlico northwards, across the great stream of the Piccadilly traffic. The constant delay and frequent collisions at this point will be in no way lessened, or only very slightly, by the new plan. An ideal arrangement would be one which would concentrate the more crowded, and what may be called the rougher, traffic in one line, and keep it clear of the equestrian and carriage traffic direct to Hyde Park. We are inclined to think this may be done with a re-adjustment which would leave the essential merits of the scheme unimpaired, or by the scheme of carrying one road over another, which was long ago proposed in our pages by the late Mr. E. M. Barry; but the time is too short this week to expound such a plan in detail, which could hardly be done without further illustration than mere words could afford. If with this could be combined the retention of the Wellington Arch in its present position (and

we believe it can), a most important advantage would be gained. The proposal to take down and rebuild the arch is an objection in more ways than one. It would greatly increase the expense of the alteration (which we believe has been under-estimated); it would remove the arch from what may be called its historical position, which is, in itself, undesirable; it may lead to some injury to the structure, which, be it remembered is a fine specimen of its school of architecture (speaking of it quite apart from the statue, which was no part of its original design), and would have the further architectural disadvantage of placing the arch on lower ground than at present, and in a position in which it would have no reference to any other lines of building. The arch, if it is to form a feature of the place, ought to remain on the highest ground of the said place, as it would be if left where it is; and it will be far more capable of effective treatment if left where it now stands. And we surmise that when the scheme comes to be more maturely considered, the removal and rebuilding of the arch is likely to receive considerable opposition, and is an unnecessary expenditure of public money in a manner which will not give satisfaction when done. Further than this general criticism we do not go at present; but we may probably have more to say.

One point we cannot but press on the consideration of those concerned: that the opportunity should be taken of removing the equestrian statue from the top of the arch, for which it was never intended, and for which it is in every way architecturally unsuitable, the statue and the arch, in fact, mutually injuring each other. This has been pointed out so many times, and so many people seem still quite uninformed upon the subject, that we must be excused for calling attention to it once more at what seems a more opportune moment than has ever yet occurred. The statue should be placed on a pedestal of its own, of suitable proportion, and might then form another feature in the proposed place. We do not pretend that the statue is of any particular value from an artistic point of view, but it is so closely connected with the memory of a great man and of a nation's appreciation of him, that of course no one would think of cornering it. But it is perfectly out of place where it is.

We may anticipate one objection to leaving the arch where it is by observing that the present width of road between it and St. George's Hospital would probably be sufficient when the relief of the traffic is provided for by the new road. But we wish to emphasise the point, that the block at Hamilton-place is hardly touched by the new scheme, and that it is one which will tend to grow worse rather than better; and if the public find that they have been persuaded into paying for so serious an alteration as the removing and rebuilding of the arch, for a scheme which leaves one of the two blocks just where it was, the carrying out of the scheme will hardly give the satisfaction which has been, we think, rather hastily expressed in the first instance. There are some practical difficulties, no doubt, in the way of lowering Hamilton-place and the new road to get under Piccadilly and Constitution-hill, but they are not so great impediments as would be involved in taking down and rebuilding the arch; and there would be the very solid advantage that the block at Hamilton-place would be absolutely done away with, and the scheme would really accomplish all that it professes to accomplish, instead of only half. It must be remembered that nothing like a tunnel is necessary; only a sunk roadway over which Piccadilly and Constitution-hill would cross on bridges, which might be made picturesque objects and additions to the general effect of the site. At all events, the idea of the sunk road should not be entirely abandoned until it can be shown that there is any other arrangement which will really get rid of the whole inconvenience arising from stoppage of traffic, which the proposed arrangement will not. It may be pointed out that a road low enough to pass under Piccadilly would be just about the right level at the point where it would approach Halkin-street, as the ground falls very rapidly. As far as we remember from a hasty inspection, the levels were not fully or truly represented in the model exhibited at the House of Parliament; the whole was too flat. The contour of the ground is, however, a very important element in the matter, every point in which should have full consideration from practical men before the work is really entered upon.

## EDINBURGH ARCHITECTURAL ASSOCIATION.

At the usual fortnightly meeting of the above Association, held in their rooms, George-street, on the 22nd ult., Mr. McLachlan, president, in the chair, Mr. Andrew Dewar read a paper on "Dead and Living Architecture." Commencing by saying that everything may be broadly classed as dead and living, architecture, he showed, was no exception. By dead architecture he did not mean a building in skeleton or in decay; for a crowded hotel might, as a piece of architecture, and wanting the stamp of vitality in its style, be "dead as a door-nail"; while a structure once really alive in its art would live eternally, if only a crutch of it remained in position. The cause of architectural deadness was found first in the natural imperfection of architecture; and secondly, in the more specific natural imperfection of architects in not endeavouring to master one style of architecture thoroughly, instead of dabbling in half a dozen; and further, in not designing every house, church, or dog-kennel that passed through their hands as if they were to live in, preach in, or sleep in, each themselves. Describing the tenements of the day, he said the houses were constructed to sell, not to inhabit; the doors were fitted for the perfect inlet of draughts, the fireplaces for the special object of smoking, the flues for the transmission of back smoke, the floors for the habitation of rats, while the cisterns provided a watery grave for the mice. Nor was sanitation overlooked, for ample ventilation was supplied from the street sewers. As an instance of dead art, the heads on the keystones of the Phrenological Museum were mentioned; for, while a head is an interesting object as long as it is attached to a body, it can be nothing but horrible when hamstringed and sawn off to the radius of an arch. The carving of the New University was called attention to. A panel facing Forward road had been commenced, in which patches with floriated tails were visible, but the meaninglessness of this kind of decoration having become apparent in the execution, no more is to be done, and subjects illustrative of the class work of the University will be executed instead, so that the building may tell its own story, and in this way show itself to be alive and not dead. The stagnation in church form was also adverted to: a cross 800 years ago was set up as the true church form, and on this cross art was apparently to be crucified for ever. The paper gave rise to considerable discussion.

## LEEDS ARCHITECTURAL SOCIETY.

At a meeting of this society on Thursday evening, last week, in the library of the Philosophical Hall, a lecture on "Dutch Architecture" was delivered by Mr. E. Phéas Spiers, F.R.I.B.A., of London. The President (Mr. James Barlow Fraser, F.R.I.B.A.) occupied the chair. In the earlier portion of his paper, the lecturer described the civil and domestic architecture of Holland, omitting the cathedrals and churches, which had been described by him on a previous occasion. He stated that the architecture of Holland may be divided into five periods—1. That which belongs to the mediæval epoch, and which extends far into the sixteenth century, examples of which may be found in the cathedrals of Bois-le-Duc, Utrecht, and Haarlem, the town hall of Middleburg, and the Waaghuys of Deventer. 2. The work of the seventeenth century, including, as examples, the town halls at the Hague, Haarlem, Kempen, and Leyden, and the Waaghuysen, or weighing-houses, of Leuwarden, Hoorn, and Alkmaar. 3. The architecture of the eighteenth century, consisting principally of buildings of pretensions but uninteresting character, based upon the French Louis XIV. style. 4. The work of this century, which is quite commonplace, without very much to redeem its ugliness. 5. Modern work. Many of the above-mentioned buildings, together with several others, came in for detailed description, and their several quaint and picturesque characteristics, arched porticoes, pilastered and mullion-windowed fronts, curious crenelated and carved gable-ends of curvilinear outline, with here and there a tower crowned with a belfry stage with balconies, lanterns, cleverly grouping with the rest of the buildings, were illustrated by means of numerous exquisitely-drawn and tinted water-colour drawings, some of which were exhibited at



Burlington House last year. The remainder of the lecture was devoted to a description of the Plantin Museum at Antwerp, of which Mr. Spiers exhibited complete plans and some water-colour sketches, together with an extensive series of photographs lent to him for the occasion by Mr. Alma Tadema. This building still retains all the original arrangements of the sixteenth and seventeenth centuries, and is a typical example of a printing establishment of that period. At the conclusion of the lecture, a vote of thanks was unanimously accorded to Mr. Spiers, on the motion of Mr. Thomas Ambler, seconded by Mr. J. Kelly.

#### THE LONDON PARKS AS FOG FACTORIES.

HAVING been a resident in, or close to, the Regent's Park for a great number of years, I am in a position to confirm the statement as to the defective surface-drainage of the Park made in the extremely able and interesting letter from Mr. W. H. White, which appeared in your columns last week. It is far from my intention to play the part of the dirty bird of the familiar proverb, and asperse my own nest, since my reason for continuing to live in the Park is a conviction, founded on very long and careful observation and experience, that there is no more thoroughly healthy, convenient, or enjoyable place of residence to be found in London. But with reference to the question of London fog, it is a true indictment against the Regent's Park that it is, as is presumably the case with the other London parks, a brewery of mist, doing a brisk and regular business on an extensive scale. The whole area was, no doubt, elaborately drained some years ago, but the pipes were laid at so excessive a depth that, although they may possibly work in an energetic and beneficial manner in their own remote spheres, the surface of the ground is quite unaffected by any action on their part. The consequence, which any one who will walk across the park can verify, is that the surface is always more or less sodden, except in very dry weather. After any heavy rain, a number of lakes of various dimensions appear in different places, and take a long time to soak away or evaporate, assuming, some time before their departure, the character of slimy bogs. In times of drought, when the water which forms so considerable a proportion of the bulk of the soil has been withdrawn, fissures, which are suggestive of the story of Korah, Dathan, and Abiram, gape in all directions.

What is wanted to render the ground wholesome, and to cause it to be a less fruitful parent of fog, and a veritable *nimborum patria*, than it now is, seems to be the very simple, necessary, and obvious expedient of providing some ready and available means of escape for the rain which falls upon it. In Sussex, where I have a house, and where the soil is, mechanically speaking, though not in its mineral constituents, the exact counterpart of the London clay, deep draining, in the case of soil which is disposed to be obstinately retentive of moisture, is not found to answer. It is considered a mere waste of money to bury pipes, and therefore capital, at a depth of between 3 ft. and 4 ft. The water is so long in reaching them that the evils of total want of drainage are hardly reduced by their existence. Were they absent, the water would, no doubt, eventually escape by some means or other, and no more slowly than it does with their assistance. My own experience is very small, but it is entirely confirmed by that of one of my neighbours, who is among the largest landowners in the county. Mine is confined to a patch of 12 acres, which was drained after the exact pattern of Regent's Park, and at the same time; but I do not remember the precise depth at which the pipes were laid. The ground remained as muddy and glutinous as before; but I afterwards laid pipes at 2 ft., leaving the original ones untouched, and the result has been that the soil is now, on all occasions, completely and at once relieved of surplus water, and, instead of resembling new cheese in point of consistency, it is becoming comparatively light and friable in texture. A clergyman of this district who was imported from a Northamptonshire rectory tells me that he deep-drained the whole of his glebe-land there, which was clay, without the slightest effect whatever.

After all, there seems to be no occasion to refer to any controverted principles of draining, or to examples of the result of one system or

another. The whole disquisition on the drainage of the park, illustrated by a capital working diagram, is best presented in the form of a mere statement of the actual and palpable condition of the ground, which should be verified by inspection of the spot. If the authorities who are responsible for the defects which exist should at any time contemplate some action in the matter, it ought to be remembered, as an encouragement to them to proceed, that the case is one which by no means concerns the residents in the park only, but the whole population of the metropolis; for the double reason, that it is desirable to secure that "the lungs of London" shall be supplied with air which is free from marshy effluvia, and to preclude the wholesale generation of fog. The expense, of course, of draining at 2 ft. would be very much less than that which was incurred in the deep-digging for the abortive operations of some years ago, and there would be no occasion to disturb the complete repose of the existing pipes, which may remain *in situ* to discharge any functions which they can be imagined to exercise.

It might be possible, perhaps, in arranging for outlets for new drains, to get some advantages through the old expedient of constructing what are called "blind wells,"—that is to say, rough shafts sunk through the clay into the first porous stratum below it. Pipes which are led through the side of a blind well discharge their contents into what is, practically speaking, a bottomless pit. In the Regent's Park, the overcoat of clay which covers the sand is probably thin here and there. The house from which I write, and those adjoining it, are all built on sand, which was very soon reached when the soil for their foundations was excavated.

T. W. EBLE.

Cambridge Gate.

#### SILICATED STONE AND ITS USE FOR DRAIN PIPES.

SILICATED STONE is now coming largely into use, and appears to have a wide future before it. A visit to the works of Messrs. Hodges, Butler, & Dale, at East Greenwich, shows the great extent to which the material is now being made and used, not only in the form of the "Imperial" stone paving, but for lintels, cills, steps, and a variety of other purposes, including the making of drain-pipes. The "Imperial" paving, owing to its durability, and its cheapness as compared with the price of York paving in the southern counties, is being extensively used. The aggregates employed in the manufacture of the material are clean Thames gravel, crushed by machines, furnace or iron slag, Kentish rag stone, granite chippings, or other approved materials, broken to the requisite degree of fineness by a Blake's stone-breaker. The ingredients are accurately mixed by measure in the proportion of 1 of Portland cement to 2 or 3 of aggregates (according to requirements), and with a minimum quantity of water, in an ingenious mixing-mill of American invention. The paving slabs are made in shallow moulds framed with wood and lined with sheet-iron. The mould, during the time a slab is being moulded, is fixed to a very ingenious, though noisy, machine, called, from its continual shaking, the "Trembler." The mould being adjusted to this machine, the latter is set in motion, and the fine concrete (for such it is) from the mixing-mill, is fed into the mould as the latter vibrates up and down on the machine, a couple of men, armed with ordinary bricklayers' trowels, arranging and smoothing the material while the mould containing it continues to vibrate. This trowelling, of course, requires some dexterity, but the knack is soon acquired. The object of the vibratory motion imparted to the mould is, of course, to consolidate the material, and to secure smooth and perfect moulding. A 3 ft. by 2 ft. slab is thus made in less than five minutes from the time the ingredients were put into the mill. The slabs are kept in the moulds for three or four days, and then placed in a bath of solution of silicate of soda for about a week. This secures the induration of the slabs. They are then kept for about three months before being sent out.

The silicated stone pipes are made in a similar manner, the details of the moulding apparatus varying, of course, from those used for slabs, cills, and lintels. We need not, however, stay to distinguish and describe these details, but will pass on to notice the results of some experiments recently made at the works (and witnessed by us) to test the comparative strength

of these silicated stone pipes and good stoneware pipes. The tests were made in the following way:—To one of the vertical piles or timbers which support the roof of one of the buildings, a timber lever, 15 ft. long, was pivoted. Near the pivot, and a short distance in front of the pile or upright referred to, was the fulcrum, which was a piece of 3 in. by 3 in. quartering, shod with iron at the top, and resting at the bottom with its full sectional area on a piece of 2 in. batten, 1 ft. 7 in. long and 4 in. wide. This piece of batten was slightly hollowed out on its under surface for its whole length, so as the better to rest on the pipes to be tested. All the pipes tested were evenly laid on a balk of timber covered with a sack, the socket or collar ends of the stoneware pipes being, of course, left perfectly free. On the other end of the lever,—that is, 15 ft. away from the fulcrum,—a cask was suspended, and this was gradually filled with gravel until the weight borne by the fulcrum was sufficient to fracture the pipe on which it rested. All of the six pipes tested were tried under precisely similar conditions. The following table shows the weights required to fracture the pipes, tabulating them in the order in which the tests were made:—

No. of Experiment.	Description of Pipe.	Weight required to cause fracture.
1	9-in. Stoneware	2,873 lb.
2	9-in. Silicated Stone	4,053 lb.
3	9-in. Stoneware	2,438 lb.
4	9-in. Silicated Stone	3,683 lb.
5	9-in. Stoneware	3,293 lb.
6	9-in. Silicated Stone	3,953 lb.

It will thus be seen that while the average weight required to fracture the stoneware pipes was 2,868 lb., the average weight required to fracture the silicated stone pipes was 3,893 lb., or 1,030 lb. in excess of the average weight which fractured the stoneware pipes. The main lines of fracture were in the direction of the length of all the pipes tested. The results of these experiments do but confirm other experiments which have been made to test the strength of the silicated stone pipes, which possess the merit of being perfectly true in section. The joints are of ogee form, moulded in the whole thickness of the pipes, so that they are easily put together, a little liquid Portland cement being applied to the joints by a brush. Joints made in this way have stood some remarkable tests.

Altogether the material and the goods made of it are well worthy of the attention of visitors to the Building Exhibition at the Agricultural Hall, where Messrs. Hodges, Butler, & Dale have a stand (No. 50).

#### PHOTOGRAPHY AS CLERK AND DRAUGHTSMAN.

IN employing photography in the capacity of a clerk or draughtsman, there is always one inestimable advantage: you can rely implicitly on the truth and correctness of the result. And this quality, we believe, is likely to cause photography to be employed in years to come to a very great extent in the bureau of the statesman, the counting-house of the merchant, the office of the lawyer, and the workshop of the engineer. True, we have now-a-days many clever autographic copying processes,—the gelatino-glycerine cake is one of the simplest and best,—by means of which a writer may take one or more copies of his manuscript; but these, if they render photography unnecessary in certain instances, do not restrict the usefulness of the art in any degree. The *Photographic News* says:—"There can be little doubt that prepared photographic paper will soon be found in every large office where valuable documents abound. The labour saved, as well as the accuracy assured, are already important points, and when to these is added the circumstance that a *fac-simile* is the result, firms of many kinds will not be slow to avail themselves of the advantages of photographic copying. With a camera at one's disposal, it is possible, of course, to do yet more, for huge manuscripts may in this way be reduced to small dimensions, while their intrinsic value yet remains. But to use a camera, more photographic skill is required. Very little knowledge, on the other hand, is required for simple photographic printing of the nature we have mentioned, and with its aid the duties of clerk and draughtsman may often be advantageously discharged.



### VENTILATION AT THE LONDON CUSTOM HOUSE.

SIR,—I am sorry to have injured or offended Mr. Boyle, and am quite willing to correct any mistakes in detail I may have made, and would gladly admit his system to be right, and my theories wrong, should they be so; and, indeed, I should rejoice at such a result, as saving much further trouble, for I have no interest in the matter other than an architect should have, namely, to ascertain and adopt the best.

The points, however, in which he corrects me seem to be of small importance, and not to affect the main issue, which is, whether the system adopted at the Custom House be successful or not, and whether the special appliances used there are the most suitable for the purpose.

I do not regret having brought the matter forward, not only on its own account, but because I am sure that serious public injury is done by the numerous unreliable sanitary appliances advertised and sold. But recently, I discovered that I had been for years worse than uselessly paying rent for a filter, since, on having the water from it analysed, it proved more impure than that in the cistern outside it. While I was honorary secretary of the Royal Institute of British Architects I helped to give Messrs. Boyle the opportunity to ventilate, at great cost, the meeting-room in Conduit-street; and, after several years' painful endurance on the part of the members, all those appliances were removed, and another system adopted.

The system of ventilation used at the Custom House consists simply of certain fresh-air inlets and foul-air outlets. All the former were, on the occasion of my visit, in but moderately cold weather, sealed by ledgers, and the room reduced to its previous condition as regards fresh-air supplies, unless the outlets act, as Mr. Boyle denies that they can occasionally, by means of down-draughts, in both capacities. If I am not allowed to say that under such circumstances the system is a failure, I must leave to others than Mr. Boyle and myself to pronounce whether or not it be a success.

It is, however, I think, desirable that it should be known who has given a favourable verdict of it; for I take the abnormal use of the ledgers of the establishment as an expression of that of the occupants of the room. Mr. Boyle also admits the necessity for and non-existence of means of warming the supply of fresh air, which was one of the points to which I called attention. It is a vital one, because, as I have always maintained, no system of ventilation can be satisfactory that does not temper the cold of the air-supply, and that every heating apparatus should be made a fountain of fresh air from without the building.

But I must ask the following questions, which, I think, demand answers. Did Mr. Boyle himself frame or dictate the laudatory report that induced me to visit the Custom House? Did the so-called body of scientists ever frame any report, or try any series of experiments? Or was all that took place that certain gentlemen were asked separately and individually to inspect the alterations before the system was complete, in consequence of which some of them refrained from giving any opinion at all?

I admit that the outlet ventilators, of 3 ft. diameter, are above the roof, and that the divisions of which I spoke are in the base of these, and not in the shafts below, which are only 1 ft. 6 in. in diameter. Still, it seems to me that the points I raised apply equally to these conditions, and I am ready to be, but am not, convinced that these ventilators are other than obstructions to the capacity of the smaller shafts as outlets, or whether more foul air would not pass out if the "air-pump" arrangements were removed, and a means of regulating down-draughts with merely rain-guards, or other existing cowls, substituted.\*

Mr. Boyle's main accusation against me is, that I favour Mr. Banner, whom I did not mention in this matter. I know Mr. Banner only as I do Mr. Boyle, in connexion with sanitary experiments in which I have no personal interest. I once criticised his system, and was courteously invited by him to inspect it further, when I tested it in various places, and under different conditions, and became convinced by the results, and have since occasionally adopted it, as at Lambeth Palace, where I placed a

\* The writer proceeds to ask some other questions, but as we are not prepared to afford space for the replies it would be useless to insert them.

Banner's cowl on the top of the "Lollard's Tower," where it still stands, extracting much foul air with advantage from a large drain below.

JOHN P. SEDDON.

SIR,—Mr. John P. Seddon appears to be under some misapprehension when he wrote the letter which appeared in your issue of the 11th ult.

No report was ever made by the body of scientists referred to, nor, in fact, any series of experiments tried by them.

All that took place was, that certain gentlemen were asked separately and individually to inspect the alterations made in the ventilation of the "Long Room" of the Custom House.

Speaking for myself only, I may add that I carefully avoided expressing any opinion upon the system of ventilation adopted, which was not completed at the time of my inspection; although I believe I was one of the last who visited the building.

ERNEST TURNER.

\*\*\* We have received the following letter sent to Messrs. Boyle from the Custom House, in reply to a letter from them, and which we must consider terminates the matter in Messrs. Boyle's favour:—

Long Room, H.M. Customs, London,  
24th March, 1882.

GENTLEMEN.—In reply to yours of the 27th inst., I have to inform you that I have conferred with the other members of the Long Room Ventilation Committee, and to state that we are unanimously of the opinion that your ventilation appliances have been a success.

It is evident that no system of ventilation in so large a space as the Long Room can be rendered so perfect as to suit all idiosyncrasies and temperaments, but I confidently assert that we have enjoyed, since your appliances have been in action, a purity and clearness of atmosphere to which we had long been strangers.—I am, &c., H. HANCOCK HOOPER.

To Messrs. B. Boyle & Son.

### RIVAL COWLS.

SIR,—The subject of ventilation,—a most important and difficult one,—seems by your columns of the last week or two to be again under discussion.

My name and my system of ventilation have been imported by Messrs. Boyle, improperly, I think, as the cause of what must now be considered the point in dispute, viz., is the Boyle or the Banner system really the best? If I am right as to this, I am glad it is so, and this point I venture to think can be easily and conclusively determined; but if what Messrs. Boyle have said were true, viz., that the Banner cowl is "practically out of the market," I should, besides being out of the ring, or, to speak more correctly perhaps, out of the charmed circle,—absolutely have no standing-ground anywhere. I will endeavour to show presently that I have at least the latter; and if I am considered to have that, I will then most willingly take up Messrs. Boyle's challenge, and fight it out to the end,—the agreeable end to one of us,—for the satisfaction of all lookers on. All they will say, speaking as it were with one voice, will be, "Let right be done." There has been much time spent so far in useless sparring; for the present combat, I submit it will be best for both of us to throw the gloves aside, and each be permitted to hit as hard as he can, always fair, of course, and "above the belt." Of course, "air-pump" is a mere name; for, as Messrs. Boyle state, all cowls, &c., that is, if they deserve the name of ventilators or exhausts, as compared with a mere pipe, for the escape of air up them, are air-pump ventilators, actuated by the wind.

Messrs. Boyle insinuate that Mr. Seddon has some interest in the Banner cowl. I most emphatically state that he neither has, nor ever had, any whatever, and I have scarcely ever seen him since he accompanied his brother to my house, over six years since, soon after I first introduced my system to public notice, an account of which appeared in your journal of December 11th, 1875.

I protest strongly against the interested and libellous assertion of Messrs. Boyle that the Banner cowl is "practically out of the market." It is true that at the Medical and Sanitary Exhibition, at South Kensington, no mention was made of it, or of anything else which I exhibited, though it is also true that some of those things were quite new; this, if occasion arises, can, I have no doubt, be satisfactorily accounted for. So far, then, I seem to have no standing-

ground; but I was awarded a gold medal at Brussels, in 1880, and at the Exhibition at Eastbourne, and afterwards at Brighton, where Messrs. Boyle and myself had exhibits side by side, we both, at each place, obtained awards of equal degree, but at both these places, as well as at the Exhibition at Sunderland since, the awards were given to me for my system. I quite admit that the awards given at exhibitions are very generally considered, and I think deservedly so, the reverse of satisfactory. Messrs. Boyle complain that Mr. Seddon has written in favour of the Banner cowl; so have many others, as shown at pp. 34, 85, 90, 110, 114, 115, 116, 119 of the new edition, just published by Stanford, of Charing-cross, of "Wholesome Houses," which mentions it, so that your numerous readers who are interested in this important subject may refer thereto.

I may, perhaps, have said enough to show that the Banner cowl is not "practically out of the market." I will add, however, that many thousands have been made, and that I receive most gratifying reports of their efficiency from all parts of the country.

At page 71 of "Wholesome Houses" will be found a report of the alterations I made at the Council Chamber, Guildhall, which were almost universally admitted to have produced a satisfactory result as regards ventilation. In it I pointed out that I had been requested to ventilate, not to warm, the Council Chamber. Messrs. Boyle have undertaken, I presume, not merely to effect a "satisfactory" result, but a better result than I did.

The testimonial at page 115 of "Wholesome Houses" gives the result produced in a sewer 1,200 ft. long with one 6-in. Banner cowl. At Montpelier-road, Brighton, a like result has been produced, the sewer there being 2 ft. 8 in. by 2 ft., 500 ft. long, and the satisfactory result worked out has been witnessed by six gentlemen anxiously interested in sanitary science. A like test has also been ordered to be made by the Works Committee of Hove, under the supervision of Mr. E. B. Elliot-Clark, the town surveyor, and a 12-in. sewer, about 1,000 ft. long, has been selected for the purpose; in this case, as in the former, all the gratings or "ventilators" in the streets, except one at the extreme end of the sewer, will be entirely closed, and I am now taking out a patent for a combination by which I shall be able to close that one also.

As I have before now said, referring to the efficiency and simplicity of my system, the question will resolve itself into this, viz., which cow or ventilator will most constantly and most effectually exhaust, and with the least down-draught? And now I challenge Messrs. Boyle to prove, the conditions being the same for both, that the Boyle air-pump ventilator is superior in the essentials I have mentioned to the Banner rotating or fixed final ventilating cowl, stated 1001. a side. And I would suggest, as I believe no better place for the purpose can be found, that the tests should be made, simultaneously, of course, on the double lantern above the dome of the Council Chamber at the Guildhall, by the City Architect and his chief assistant, the disputants first agreeing that the conditions are fair and equal for each other at the start of the anemometers. Each of them to be present also, at the end of the tests, for whatever time they may be fixed. Two anemometers,—one to record the up-draught only, and the other the down-draught only,—to be fixed at the bottom end of each shaft. As it may be very difficult to make the anemometers to register precisely alike, being made as near as need be alike, Messrs. Boyle may have the choice of them, and if Mr. Boyle will I hope he will be present with the freedom of the city of London in a gold box.

EDW. G. BANNER.

\*\*\* Having admitted Messrs. Boyle's assertion as to the Banner system, we have printed the above reply; but we must decline carrying on the correspondence. Our able Brother, the City Cowl, seem to possess a 40-hp. power, and can fill any number of our pages at any time,—more to their own satisfaction, however, than that of our readers generally.

**The Theatre in Russia.**—The Emperor has authorised the well-known president of the Society of Russian Dramatic Authors, M. O. Trosky, to build a private Russian theatre in Moscow. This is the first time, it is believed that a theatre has ever been left to private enterprise in Russia.



# BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

ANNUAL DINNER.

The fourth annual dinner of the Builders' Clerks' Benevolent Institution was held on Monday evening last at the Guildhall Tavern, Mr. Arthur C. Lucas (of the firm of Lucas Brothers) in the chair, supported by about 150 of the friends of the Institution. The usual loyal and patriotic toasts having been given and received with due honours (Major John Aird, of the Engineering Staff Corps, responding for the "Reserve Forces"),

The Chairman proposed the toast of the evening "The Builders' Clerks' Benevolent Institution." The Institution, he said, was founded in the year 1866 for the relief of necessitous clerks of builders, their widows, and families. In the first year of its existence the subscriptions amounted to 292*l.*, and 12*l.* was expended in relief. During the past year the subscriptions and donations amounted to 536*l.*, while 215*l.* was expended in relief. Great, however, as had been the increase in the income of the Institution, the receipts had not increased in anything like the same degree as the expenditure, or in anything like the proportion which they should assume, having regard to the importance and extent of the building trade. He trusted that there would soon be evident a marked improvement in that respect. He found that the master-builders and merchants connected with building were well represented as subscribers to the funds of the Institution, but he did not think that the class for whose special benefit it was intended supported it in adequate numbers, and until they did so the Institution would not rest on the basis on which it ought to stand. He could vouch for the able and economical manner in which the work of the Institution was managed, and congratulated the members upon having a business-like committee and admirable officers. There were no heavy expenses connected with the administration of the charity; it was purely and simply that it professed to be, viz. the Builders' Clerks' Benevolent Institution. The building trade, as every knew, was subject to great fluctuations, and sometimes a press of business and sometimes a slackness. When slackness prevailed, staffs were reduced, and builders' clerks, through that cause and through illness, might and themselves so reduced in circumstances as to be glad to avail themselves of the help which the Institution afforded alike to subscribers and non-subscribers, who stood on an equal footing, except that former subscribers or their relatives might seek annuities from the Institution could poll, to start with, ten votes for every annuity subscribed. In conclusion, the Chairman appealed to all present to do their best in support of the Institution, which, he said, served well of those for whose special benefit it was intended.

The toast was enthusiastically received. Mr. Stanley G. Bird proposed "The Architects and Surveyors," observing that the architects had done great things of late years in striving for the better the face of our great city. The work of the surveyor was not quite so apparent to the general public as to builders and builders' clerks, who were often very much indebted to the surveyors, although, if not properly up to their work, they sometimes made matters worse when they were called in. Not very long ago he had heard a proposal for "reducing" all building surveyors gravely disapproved. He believed that some such system obtained in Scotland, and worked very well there. How it would answer here he could not say. With the toast he begged to couple the name of Mr. H. Matthews.

Mr. Matthews, in reply, observed that what might be said about surveyors, he believed he saved more squabbles than they caused. Mr. E. C. Roe, in a humorous speech, proposed the Builders, Our Masters," observing that many of the best builders had been builders' clerks in their time, and possibly some of the best present might ultimately develop into the glorious caterpillar, the British Builder; when he used the word "builder" he meant Builder; he was not thinking of the ingenious fleming who wrought powerfully in the "cockney Rye Italian" and the "Stoke Newington Strono Gothic" styles. The Egyptians, steeper their sanitary arrangements might be, but, probably they kept them outside, and certainly builders of enduring works, and amongst the valuable papyri that had lately

been discovered, he had found no mention of such things as bills of quantities or bills of extras, or of any of the things which caused trouble in building matters at the present time. In conclusion, the speaker expressed the thanks of the builders' clerks for the interest which the masters took in their welfare.

Mr. Howard Colls responded on behalf of the Master Builders.

The remaining toasts included "The Past Presidents" (proposed by Mr. E. Brooks and coupled with the name of Mr. Stanley G. Bird); "The President" (proposed by Mr. Bird); and "The Officers" (proposed by Mr. E. C. Cox, and responded to by Mr. H. T. Bayes, treasurer, and Mr. Wheatley, secretary).

During the evening, donations and subscriptions to the amount of 180*l.* were announced.

## AN EXPERIMENT IN MASON'S AND PAVIOR'S WORK CONTRACTS.

SOME of the members of the Vestry of St. Luke, Middlesex, being under the impression that by offering the contract for mason's and pavior's work for a longer period than one year the prices would be less, invited tenders for one, two, and three years respectively, but the result both last year and this has been that the shorter the period the lower are the terms. The prices of the tenders received by the vestry last week varied from schedule prices to 12*l.* of schedule prices. The lowest tender, that of Messrs. Wheeler & Hindle, of Bankside, was accepted; for periods of two or three years only 10 per cent. would have been taken off the schedule of prices.

## SPECULATING BUILDERS AND BY-LAWS.

A SECOND batch of summonses were last week disposed of by the Hove (Brighton) bench of magistrates, when Henry Pinker, Walter Pinker, and Henry Marston, all speculating builders of Hove, were summoned for committing breaches of the By-laws for new buildings. The first summons charged them with not solidly putting the walls of certain houses together with mortar; the second summons charged them with disobeying the notice of the surveyor to desist erecting and to pull down the buildings. The case of the last-named defendant was adjourned for fourteen days to enable him to pull the walls down.

The two other defendants pleaded guilty. In both cases the result of an analysis of the mortar by Mr. Jago, F.C.S., showed the presence of large quantities of loam and chalk. The analysis in one case giving, by measure, these remarkable figures:—

Gravel and sand .....	1.744
Carbonate of lime (chalk) .....	1.275
Quick lime .....	1.000
Loamy earth .....	0.951

Mr. Elliot-Clark, C.E., the prosecutor on behalf of the local authorities of Hove, proved the cases, and the magistrates fined each of the defendants 5*l.* for disobeying the notice of the surveyor and 40*l.* for the bad work. The Chairman of the Bench, Mr. Harlock, stated that during the hearing of the last case witnesses said this mortar was a fair average sample of what was used in the district, a statement he did not believe, as he knew from personal observation such was not the case; it was a gross libel on many respectable builders, whom it would be injurious to name, and he trusted these wholesome prosecutions would have the desired effect, and put a stop to jerry building. Builders should know that they were liable to a continuing penalty from the moment the surveyor served them with notice to amend the work.

It is satisfactory to know that at their last meeting the Hove Commissioners unanimously and without comment affirmed a resolution of the Works Committee, ordering the surveyor to take down the condemned work in the houses to which we lately referred, and this is now being proceeded with. We are pleased to see that the Hove authorities are alive to the importance of their duties, and wish other corporations would follow; for it must not be supposed that jerry building obtains largely at Hove; on the contrary, many of the small houses erected there are superior to the small houses being erected by thousands round London and in many provincial towns, where the by-laws are utterly disregarded.

## DISTRICT SURVEYORS' FEES.

At the Lambeth Police-court, on the 23rd ult., before Mr. C. E. Ellison,

Mr. Henry Parsons, District Surveyor of South Lambeth and part of Camberwell, summoned Mr. William J. Mitchell, builder and contractor, of Dulwich, for refusing to pay the sum of 15*l.*, his fees on a range of stabling erected for Mr. Thomas Tilling, omnibus proprietor, &c., in the parish of Camberwell. Mr. George R. Edmunds, solicitor (Messrs. Edmunds & Son) appeared for the defendant.

Mr. Parsons, in cross-examination, said that one notice only was given under the 38th section of the Act, 1855, and that he did not demur to it; that there was no "party wall" in the whole building, the walls dividing the eighteen stalls or loose-boxes being "cross-walls"; that he had refused 4*l.* 15*s.* which defendant had offered as the proper fee; and that Messrs. Henry Jarvis & Son were the architects responsible for the plans, and under whose supervision the works were carried out.

The Magistrate said he would not be a party to the multiplying of fees in cases like this, and held that one building only (and not eighteen) was designed and constructed.

Order for payment of 4*l.* 15*s.* No order as to costs.

## INFRINGEMENT OF BUILDING BY-LAWS AT TOTTENHAM.

At Edmonton Petty Sessions, before Mr. H. Nash and Mr. J. B. Doe, Messrs. Bowitt & Hughes, builders, of Hornsey, were summoned for contravening By-law No. 12 of the Tottenham Local Board of Health in building three houses in Waverley-road, Park-lane, Tottenham.

Mr. Crowne, clerk to the Local Board, appeared in support of three summonses in respect to three houses erected by the defendants, which were not "enclosed with walls constructed of good brick, stone, or other hard and incombustible materials, properly bonded, and solidly put together with good mortar, compounded of good lime, clean sharp sand, or other suitable material, or with good cement, or with good cement mixed with clean, sharp sand," as required by the By-law No. 12.

Mr. De Pape, surveyor to the Local Board, and Mr. Wilson, surveyor of buildings, gave evidence of the walls not being properly bonded to the end walls, and as to the mortar, samples of which, taken from the brickwork and heap adjoining the houses, were produced in court, and declared to be totally unfit for use as mortar, there being in it very little lime, and that, evidently, spent lime.

Mr. Peckham, solicitor, who appeared for the defendants, urged on behalf of the defendants that the fault was not that of the defendants, but of a man in their employ. The defendants were fined 5*l.* for each of the three houses, with costs.

## THE DECAY OF BUILDING MATERIALS.

SIR.—Your correspondent, "G. R.," asks "why the masonry disintegrates so rapidly at the present time?" The question has been discussed so often in your own and other journals during recent years, that the postulate rather surprises an elderly man. Assuming, however, that "G. R." is comparatively young, I beg to offer the following notes on the subject of his inquiry. The freestones were originally deposited in successive layers of water; drying and parting with their water afterwards, they altered in their dimensions, and contracted, cracking irregularly. Thus lamination, the source of their destruction in buildings, is formed. They are exceedingly porous, and (as masonry) absorb moisture from the air and rain of our wet climate. Constant expansion and contraction of this moisture within the substance of the stone takes place during every twenty-four hours. This expansion, when it precedes freezing, acts with irresistible force, and with such rapidity, as not to give time for the excess of moisture to be drawn out as it came in. Some stones, of course, decay sooner than others. Those that are the most crystalline contain the fewest crevices, and are therefore least absorbent. These facts sufficiently indicate the cause of destruction. In addition, however, the moisture of the air and the rain in London are impregnated with various gases,—carbonic acid, from millions of men and animals; sulphurous acid, from gas illumination; ammonia (another result of animal life); hydrochloric acid, from the Lambeth potteries; and unconsumed carbon or smoke, which hangs like a pall over the city. These gases are all soluble in water, and are absorbed into the pores of the stone.

These facts, moreover, account for the gloomy and unsightly effect of the smoke-blackening of our elaborate and costly public buildings; for soot is carried with the water into the body of the soft stone, which is therefore quite unsuitable for city architecture. In London the whitest Portland stone is defiled in a few weeks. The remedy, in my own opinion, is the use of the igneous rocks, combined with a modification of style, which you have allowed me to suggest more than once in your interesting journal.\* It is much to be desired, in the interest of

\* See *Builder*, Dec. 3, 1881, for "Pietra Dura Architecture."



true economy, that Mr. Shaw-Lefevre, or whoever in the Office of Works is responsible for the good and sound construction of the national buildings, would take a step in advance when giving, at no distant day, the usual instructions for the designs for the intended New War and Admiralty Offices. The necessity for this would be strikingly shown if some hon. member would call for a return of the cost of restoring the Houses of Parliament.

The buildings mentioned by "G. R." are all more or less decayed.

HENRY TRAVIS.

#### ARCHITECTS' COPYRIGHT.

SIR.—A curious point has arisen in my practice, on which your advice and the opinion of your readers would be highly acceptable. I am employed by a Board in the country to erect certain public buildings, for which I have prepared working-drawings and specification in the usual way, and which are now being carried out under my superintendence. For some reason or other (though what it may be I cannot guess), and without my knowledge or consent, the Board have ordered my specification to be printed, and copies have been distributed to all the members, and I know not to whom else.

The point of professional practice is, whether the Board have, in employing me, bought also the copyright of my specification, and the right to scatter it broadcast as the members choose? The document in question is one which embodies the results of twenty years of experience, and which is certainly not paid for by the five per cent. commission on one structure.

The right, if it belongs to the Board, to copy the specification, can easily be extended to the drawings, and the whole of an architect's professional training be placed at the mercy of a careless or an interested Board-man.

A COUNTRY ARCHITECT.

#### EXCHANGE STATION, LIVERPOOL.

SIR.—By the paragraph which you recently quoted from the *Bottle Times* agent the re-construction of the above, the public may be led to suppose that the advisability of doing away with the very steep and unsatisfactory approaches to this station had only recently been brought under the notice of the directors of the Lancashire and Yorkshire Railway Company by Sir John Hawkshaw.

Permit me to correct this impression by stating that a design providing for the reconstruction of the station on a level with Tithebarn-street was prepared and sent in at the time of the late competition.

Herewith I enclose you a copy of the description of the design submitted under the motto "Questi," and which, I believe, was the only set sent in showing the practicability of working the station without the inclined approach. It is well known that the three premiated designs maintained the approaches somewhat in their present objectionable position; I need, therefore, say nothing upon the fairness, or otherwise, of the award of Sir John Hawkshaw, than to call attention to the fact that although he gave premiums to the designs with such approaches, he does not hesitate to recommend the principle of the "Questi" design as being the most suitable for the purposes of the Company.

J. H. ANDREWS.

#### BRICKS.

SIR.—In answer to "P. P. C." we have at our Eburia Works both the moist steam utilised, also moist heat from the kilns, according to Mr. C. Cooper's process, and shall be pleased to give all information.

GEO. WOOLLCROFT & SON.

MESSRS. LINGARD & BUCHANAN SAY.—"The system you refer to is to be seen in operation at the works of the Harrowden Brick and Tile Company, Hill Top, Harrowden, near Wellingborough, Northamptonshire. The above is part of the system connected with Cramp's Patent Kiln."

#### THE GENERAL FOREMAN.

SIR.—Being a practical man, and a general foreman of some twenty years' standing, I wish to say a word in contradiction to your correspondent "T. M."

It is not only now getting to be very general to appoint a general foreman, but has been so for many years, even before I started in this line of business, and I must say that, instead of its being a mistake on the part of builders, it is, under the present conditions of the trade, a matter of necessity in all works of importance, and if done more generally on small works the builders would very soon find the benefit in their cash account.

No doubt he is right as regards a general foreman not having a practical knowledge of every trade, but, if he is a general foreman in the true sense of the word, he has a general knowledge, and is so far practical that he can instruct and direct mechanics, the result being a better job, while workmen generally appreciate his advice.

Master builders, as a rule, do appoint a foreman over each trade, who is subject to the directions of

the general foreman. There is no doubt there are masters in the building trade who do not properly understand it, and who may, in consequence, appoint a man as foreman who is not competent (hence the number of failures spoken of), but I do not see why, if this occurs, your correspondent should put all down as blockheads.

I am quite confident that if there were no general foremen, the works would be messed about, and mistakes and confusion would be the result, and many more master builders would be ruined than is the case at present.

A PRACTICAL FOREMAN.

#### "COLOURING PORTLAND CEMENT."

SIR.—I can recommend "W. S. M." to use "Asbury's" Patent Varnish Paint. I have known walls in hospitals, and offices, &c., in railway stations, which have been treated with this paint, and no amount of washing seems to have any effect.

B. S.

#### VARIORUM.

MR. ARTHUR G. HILL, B.A., F.S.A., of Jesus College, Cambridge, has ready for the press, and is about to publish for subscribers a work which ought to prove valuable, "An Essay on the Organ-cases and Organs of the Middle Ages and Renaissance." This will be an imperial 4to. volume, and will contain artistic and musical memoranda, &c., but the chief feature will consist of numerous drawings, from the pen of Mr. Hill, of the finest and most remarkable Gothic and Renaissance organ-cases from churches in various parts of France, Germany, Holland, Belgium, Italy, and Spain, illustrating these master-works of the 14th, 15th, 16th, and 17th centuries.

#### Miscellaneous.

##### Artisans and Labourers' Dwellings.

The Select Committee of the House of Commons appointed to inquire into the subject of Artisans and Labourers' Dwellings, resumed its sitting on Monday morning, Sir Richard Cross presiding. Dr. Gibbon, the medical officer of health for Holborn District, whose examination was not concluded at the last sitting of the committee, was re-called, and in continuation of his evidence, said he knew the district of Gray's Inn-lane well, and the improvements started there in 1877. The working of the 33rd section of the Artisans' Dwellings Act had greatly impeded, and had, in fact, stopped, the carrying out of the improvements during the last five years. A large number of poor people had been ruined by it, and it had caused discomfort to all. The whole of the district there was adverse to section 33, and would be glad to see it mitigated. It was almost impossible to replace some of the habitations that had been pulled down so as to be of equal use and advantage to the occupiers. There was a large number of costermongers and men of that class in the district, and they could not live in model lodging-houses and carry on their business, because they required room to wash their vegetables and to stand their barrows. The result had been that many of these people had been driven away, and had gone to neighbourhoods where they could find the accommodation they required. The neighbourhood was ruined both from a sanitary point of view, and from a moral point of view, and many small respectable tradesmen and ratepayers had been pecuniarily ruined. In consequence of alterations to Gray's Inn-road, many of the other streets of the district and in Clerkenwell had become very much overcrowded.

**Hammersmith Bridge.**—At the last meeting of the Fulham Board of Works, it was announced that the Board had considered and determined this matter. There were three schemes, and the one selected was to widen and strengthen the bridge, and make a footway outside the piers. Mr. Cosh regretted that they were not to have a new bridge, and contended it would have been a wiser and cheaper policy. Mr. Smith said it would be money wasted.

**Sir John Soane's Museum.**—Charles Spencer Perceval, LL.D., Treasurer S.A., has been elected a Life Trustee of Sir John Soane's Museum, to fill the vacancy caused by the retirement of Professor Donaldson. We may repeat, what we have before said, that every facility is given to visitors at the Museum.

**Richfield.**—For "In 1880 the population was 4,512" (p. 346, first column), read—"In 1801," &c.

**Westminster Town Hall.**—On Wednesday afternoon the Baroness Burdett-Coutts laid the foundation stone of the Town Hall for the parishes of St. Margaret and St. John the Evangelist, Westminster. The building, which is to be of brick and stone, in the Renaissance style, has been designed by Messrs. Lee & Smith, architects, of Queen Victoria-street. The site is between Queen Anne's Mansions and Christ Church, close by the St. James's Park station of the District Railway Company. The building is intended to provide accommodation for the meetings of the ancient parishes of St. Margaret and St. John, including therein several new ecclesiastical parishes and the hamlet of Knightsbridge, for the meetings of the District Board of Works, and for the various offices of local administration. It will also contain a public hall capable of accommodating a thousand persons. The cost of the edifice will be about 25,000*l.* A view and plan of the buildings were published in vol. xix. of the *Builder*, pp. 440, 441 (October 9, 1880).

**Exhibition of Means and Appliances for the Protection and Preservation of Human Life.**—This will be held at the Alexandra Palace, Manxwell-hill (Science and Education Department), from Monday, the 26th of June, to Saturday, the 22nd of July, 1882, under distinguished patronage. The great public advantages to be derived from bringing together all the most recent improvements in apparatus and appliances for protecting and saving human life cannot be over-rated. It will, of course, include apparatus employed for the prevention and extinction of fires, and means and appliances for rescuing life; protective provisions for dwellings and other houses; and engineering safety appliances. The exhibition will open on Monday, the 26th of June, and close on Saturday, the 22nd of July. No applications for space can be received after Saturday, the 10th of June.

**Storage of Power.**—For a lecture delivered lately at the London Institution, by Professor Ayrton, before a large audience, among other experiments, the lecture-theatre was lighted, a circular-saw driven, and a hoist, which was used for raising boxes, worked entirely by means of electricity produced the day before at the other side of London and transported to the Institution in Faure's accumulators. The total energy so conveyed was about 50,000,000 foot-pounds, or about twenty-five horse-power exerted for one hour.

**"The Attitudes of Animals in Motion."** Some of our readers may be glad to be told that Mr. Maybridge will lecture at Eton College on (this) Saturday; at the Society of Arts on Tuesday; and at South Kensington Science and Art Department on Wednesday, respectively, at eight p.m. It ought to be known that his lectures hitherto have been given entirely in the interests of science and art, his object being to awaken sufficient interest in the subject for a continuance of the investigations to a more exhaustive extent.

**The Blackwell Hall Estate, South Durham.**—Extensive alterations and additions are about to be made to this fine old seat of the Allan family, which, in consequence of the terms of the will of the late Mr. R. H. Allan and the recent death of his widow, is inherited by Sir Henry Havelock Allan, Bart., who has appointed Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, as his architect for the work.

**The Elections at the Royal Institute of British Architects.**—At the last meeting of the Institute ninety-one Associates (instead of thirty-three) were elected. Ninety-five were put up, of whom four were blackballed. We have reason to believe that a considerable number of names have been sent in for election under the compulsory examination clauses.

**Royal Society of Painters in Water Colours.**—At the annual general meeting held at the Gallery of the Society on Monday, the following artists were elected Associate Exhibitors:—Miss Constance Philpott, and Messrs. R. Beavis, C. Gregory, S. J. Hodson, and J. J. Hardwick.

**Changes.**—It was announced in Friday's *London Gazette* that Messrs. Hetherington & Oliver, architects and surveyors, of Carlisle have dissolved partnership. The practice of Mr. J. C. Hetherington will in future be carried on at 14, Bank-street, Carlisle.

**Kensington.**—The mansion built by Baron Grant is to be taken down, and about seven houses, we understand, will be built on its site. Seven of them will front the high road. The designs for some of them are already made.



### An Ornithological Danger to Bridges.

In foreign climates an engineer has much to contend against. Elephants pull down telegraph poles; monkeys short circuit wires; white ants devour sleepers; snakes bite him; scorpions sting him; natives rob him; indigenous labour carries wheelbarrows on its head with two sheavels of earth, and holds that it does well. He is starved, and roasted, and roundly abused. Taking one thing with another, his life is not a happy one. In certain districts it is worse than in others; thus white ants may be found super-added to scorpions in some places, while snakes and tigers go together in others; and in South America a danger appears to exist about which nothing has been heard hitherto. Mrs. M. G. Mulhall has written a very amusing book published by Stanford last year, and entitled, "Between the Amazons and Andes; or, Ten Years of a Lady's Travels in the Pampas, Gran Chaco, Paraguay, and Matto Grosso." From Mrs. Mulhall we learn that on the line of the San Louis Railway the ostriches are so numerous as to cause much trouble; "for whenever a workman left any bolt or screw out of his hand, were it only for a moment, it disappeared, being swallowed up by these birds, and one of the engineers declared that they even went so far as to pick the bolts out of the iron bridges if they were left by chance unrevited." As no one ever heard of an engineer telling an untruth, especially to a lady, it must be taken for granted that this is true; but certain speculations arise in the mind which has absorbed such facts. What, for example, we may ask, is the biggest bit of iron an ostrich can get down? Could a large one manage to swallow a riveter's hammer? Given sufficient time, could an ostrich get out a rivet which had been closed, and swallow it? How many ostriches would be required to eat up a lattice bridge, 100 ft. span, in a year, giving them a fair chance at it?—*The Engineer*.

**Carlisle.**—The workhouse hospital is about to be considerably enlarged. The Board of Guardians have approved plans prepared by Mr. Geo. D. Oliver, architect, Carlisle.

### TENDERS

For additions to the Beulah-road schools, Thornton Heath, for the Croydon School Board. Messrs. Barton Blackwell, architects. Quantities supplied:—

J. H. Hickcock.....	£3,745 0 0
J. & C. H. H. ....	3,345 0 0
J. & C. H. H. ....	3,345 0 0
J. W. Sawyer.....	3,172 0 0
E. H. H. ....	3,170 0 0
Cole & Greenwood.....	3,150 0 0
Outsided.....	3,013 0 0
R. G. Battley.....	2,987 0 0
H. L. H. ....	2,980 0 0
Heale & Son.....	2,973 0 0
Smith & Buller.....	2,963 0 0
Hollidge & Stuart.....	2,961 0 0
W. H. H. ....	2,945 0 0
Holliday & Greenwood.....	2,973 0 0
Langley & Son.....	2,850 0 0
Bell, Bros.....	2,765 0 0
Bell & Son.....	2,749 0 0
G. H. H. ....	2,693 0 0
S. Page.....	2,650 0 0
W. Marriage (accepted).....	2,613 0 0
Philly & Son.....	2,335 0 0

For the erection of the Trade and Mining School, for the City of Merchant Venturers, Bristol, Mr. E. C. H. H. architect:—

G. W. Booth & Son, London.....	£35,351 0 0
J. E. Davis, Bristol.....	34,345 0 0
H. Lovatt, Wolverhampton.....	34,350 0 0
P. Horman & Co., Wolverhampton.....	33,430 0 0
(Unassigned), Bristol.....	32,408 0 0
W. Church, Bristol.....	31,964 0 0
Low & Edbrooke, Bristol.....	31,835 0 0
W. Cowlin & Son, Bristol.....	31,440 0 0
Wilkins & Son, Bristol.....	30,750 0 0
W. Veal, Bristol.....	30,144 0 0
Stephens & Bastow, Bristol.....	29,800 0 0
E. Howell & Sons, Bristol.....	29,778 0 0
H. A. Fosse, Bristol.....	29,303 0 0
Brook & Bruce, Bristol (accepted).....	28,998 0 0

Accepted for engine-bed and general contract, including pillars, beams, and details, at Nathaniel's, Contract No. 2. Messrs. Bradshaw & Goss, architects, Bolton:—

G. Woods & Son, Bolton, near Liverpool, Croydon.....	£2,750 0 0
Howard & Croy, Bolton.....	2,650 0 0
Wrought Ironwork, Fireproofing, and Asphalting, Homan & Rodgers, Manchester.....	2,403 0 0
or rebuilding the Old Queen's Head public-house, in Stockwell-road, for Mr. Frank Wells, Mr. Henry architect:—	
Ox.....	2,250 0 0
McLachlan.....	2,250 0 0
Stimpson & Co.....	2,403 0 0
Heath.....	2,298 0 0
Maxwell Bros.....	2,297 0 0
Tyerman.....	2,310 0 0
Pack Bros.....	2,297 0 0
Taylor.....	2,273 0 0

For alterations at the Lord Nelson public-house, opposite-street Without:—

Spencer & Co. (accepted).....	£450 0 0
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For making up Selborne and Church roads, Waltham-stow, for the Local Board. Mr. G. B. Jerram, C.E., surveyor:—

Currell & Lewis.....	£1,108 9 7
Wm. Porter.....	1,089 17 1
John Bell.....	1,088 17 1
McDonald & Dawson.....	1,069 15 9
G. Atcock.....	1,068 0 0
Wilson & Goddard.....	1,050 0 0
Eli Wilson (accepted).....	1,039 0 0
J. Bloomfield (informal).....	978 0 0

For the erection of (arcades only, and exclusive of main front) studio and business premises, Exeter, to be known as "Ye Luckie Horse-Shoe," for Mr. Harry Hems. Mr. R. Medley-Fulford, architect:—

H. Phillips, Exeter.....	£1,450 0 0
Stevens & Bastow, Bristol.....	1,000 0 0
D. Reynolds, Exeter.....	900 0 0
Stephens & Son, Exeter.....	750 0 0
J. R. Gibbard, Exeter (accepted).....	731 0 0
Webber, Heavitree (too late).....	720 0 0

For two cottages and stables at Ore, Hastings, for Mr. O. Wickatt. Mr. D. Jones, architect:—

James Stanfield, Ore.....	£240 0 0
Upton & Son, Ore.....	40 0 0
Fred. Thorpe, Ore.....	388 0 0
Wm. Small, Ore (accepted).....	320 0 0

For constructing drains and picking up and repairing roads on the Nubury Estate, Thornton Heath, for the Directors of the South-Eastern Freehold Land Society. Mr. S. B. Grosvenor, surveyor:—

P. Pound (accepted).....	£210 0 0
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For erection of schools for 750 children for the Kingston-upon-Hill School Board, in Buckingham-street, Holler-road, including out-offices, fence-walls, and asphalted playgrounds. (Area of site, 3,333 square yards.) Mr. W. Bostwick (Bostwick, Son, & Biscoe), architect. Quantities supplied:—

H. Grassby.....	£7,190 0 0
B. Musgrave, junr.....	6,450 0 0
J. P. Skinner.....	6,359 0 0
R. Sergeant.....	6,240 0 0
Alfred Brown.....	6,238 0 0
G. Jackson & Son, Burnley.....	6,150 0 0
J. Drury.....	6,092 0 0
T. T. Dickinson.....	6,080 0 0
M. Harper.....	5,917 0 0
Hobbs & Liggins (accepted).....	5,889 0 0
Executors of T. Southern (withdrawn).....	5,888 3 0
R. Habbershaw & Son (withdrawn).....	5,285 10 0

For Eddington Sewerage Works. Mr. E. Pritchard, engineer. Quantities by E. J. Purnell:—

Contract No. 1.—Cast Iron, Earthwork and Brick

T. Nelson & Co., York.....	£15,144 0 0
J. M. Smith, Westminster.....	14,800 0 0
G. Cowdery & Sons, Newent, Gloucester.....	14,401 7 0
Fotherby & Son, Burnley.....	13,998 3 10
Hill Bros, Beckenham.....	13,405 0 0
John Devons, Dudley.....	13,254 8 7
J. M. Pickett, Birmingham.....	13,110 0 0
John Fall, Leamington.....	12,950 0 0
Wm. Holland, Leicester.....	12,822 0 0
H. Hilt, Birmingham.....	12,730 0 0
Currell & Lewis, Birmingham.....	12,378 0 0
A. Palmer, Birmingham.....	12,191 0 0
G. Law, Kidderminster (accepted).....	11,983 0 0

For repaving the Half-acre, Brentford, with 3-in. York paving, or patent Victoria Stone, at par foot, for the Brentford Local Board. Mr. F. W. Lacey, surveyor:—

Loades & Brooks.....	104d. 10d.
J. Dorey.....	104d. 9d.
W. G. Goff.....	94d. 9d.
Novell & Roberts.....	94d. 9d.
Patent Victoria Co.*.....	104d. 9d.
Wheeler & Hinde.....	94d. 9d.

\* Accepted for Victoria stone.

For repairs to Grove-road and Enfield-road, Brentford, for the Brentford Local Board. Mr. F. W. Lacey, surveyor:—

Footpath, Grove-road, Enfield-road.....	£119 10 0
W. Seward.....	£119 10 0
H. Spier.....	115 0 0
James Neal.....	83 0 0
Accepted.....	139 18 0

For concrete wall, &c., in Bello-lane, Brentford, for the Brentford Local Board. Mr. F. W. Lacey, surveyor:—

Jas. Field.....	£20 8 0
B. Anthony (accepted).....	40 10 0

For the erection of house and stables at Woodford, for Mr. E. B. Evans. Messrs. Hooper & Lewis, architects. No quantities:—

North Bros.....	£23,318 0 0
Robson.....	3,948 0 0
Hodkins.....	2,848 0 0
Wells.....	2,940 0 0
F. G. & K. Vigor (accepted).....	2,765 0 0

For alterations to the High Admiral, Marylebone. Mr. Capell, architect:—

Salt.....	£374 0 0
Keston.....	374 0 0
Marr.....	374 0 0
Shurmer (accepted).....	295 0 0

For the excavation and concrete for the proposed new Council Chamber, Guildhall, for the Corporation of the City of London. Mr. Horace Jones, architect. Quantities by Messrs. William Riddall & Son:—

Chappell.....	£3,475 0 0
Lucas.....	2,943 0 0
Trollope & Sons.....	2,787 0 0
Onder.....	2,603 0 0
Webster.....	2,485 0 0
Ashby & Horner.....	2,458 0 0
Mowlem & Co.....	2,380 0 0
Holland & Hansen.....	2,318 0 0
Nightingale.....	1,946 0 0

For the Sittingbourne and Milton Infectious Joint Hospital. Mr. W. Leonard Grant, architect:—

For erecting Front Boundary Wall, with Iron Fencing thereon, and Entrance-gates, &c.

W. J. Beaumont, Milton.....	£305 0 0
C. Foad, Whitstable.....	315 0 0
J. Sager, Borden.....	320 10 0
Wood & Son, Peckham (accepted).....	291 0 0

For Wrought-Iron Fencing to three sides of the Hospital grounds. Per Yard:—

Bragg & Son, Lambeth.....	£1 2 9
Marshall, Birmingham.....	1 0 0
Stout, London.....	0 11 1
Barford, Maidenhead.....	0 11 0
Drury & Biggleston, Canterbury.....	0 9 9
Yowles, Milton.....	0 9 8
Rowe, Edmonton.....	0 8 6
Weeks & Son, Maidstone.....	0 8 4
Wright Bros, Leicester.....	0 8 0
White & Son, London.....	0 8 0
M'Laren & Co., London.....	0 8 0
Chittenden, Knight, & Co., Sittingbourne.....	0 8 0
Balls, Garrett, & Co., Maidstone.....	0 7 8
Warden, Birmingham.....	0 7 6
Johnson Bros, & Co., London.....	0 7 3
F. Bird & Co., London.....	0 7 1 1/2
Riding, Bury.....	0 7 0
Hermelich, London.....	0 6 9
Faulkner & Sons, Hareham, Surrey.....	0 6 8
Tett & Huxey, Sittingbourne.....	0 6 8
Hydes & Wigfall, Shiffield.....	0 6 4
J. & C. Brettell, Worcester.....	0 6 4
Wood & Sons, London.....	0 6 0 1/2
Parker, Sittingbourne.....	0 6 0
Bushnell, Maidstone.....	0 5 11
Hill & Smith, Staffordshire.....	0 5 11
Simpson & Wood, Darlington (accepted)*.....	0 4 9

\* And 9d. 16s. for fixing the whole.

For bank building, for the Capital and Counties Bank, Hangerford, Berks. Mr. R. King, architect:—

Woodridge & Co., Hangerford.....	£1,450 0 0
Spears & Co., London.....	1,424 0 0
Hoskins & Son, Hangerford.....	1,168 0 0

For alterations to No. 4, Otway-villas, Upper Norwood. Mr. R. King, architect:—

Basle.....	£73 13 0
Nightingale.....	273 0 0
Spence.....	232 8 0
Poele & Co.....	230 0 0

For proposed additions, alterations, and repairs, exclusive of fittings, to premises No. 1, Albert-place, Marlborough-road, Clifton, for Mr. A. Blake, Mr. Wm. Everard, architect:—

Foster.....	£1,250 0 0
Stuart.....	1,109 0 0
Atkins.....	1,050 0 0
Fryer.....	973 0 0

For painting, decorating, &c., the interior of residence, Park Villa, Hampton Hill, Middlesex, for Mr. J. Jewell. Mr. Wm. Everard, architect:—

Richardson.....	£181 0 0
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For new factory for proprietors of Dr. Ridge's Food, at Boleyn-road, Stoke Newington:—

Thomson.....	£3,619 0 0
J. Anley.....	3,570 0 0
K. Knausels.....	3,498 0 0
Forrest.....	3,378 0 0
W. Sharnum.....	2,941 0 0

For the erection of a sailing, dwelling-house, &c., at Gosham-place, Notting Dale, for the London General Omnibus Company. Mr. Alfred Cook, architect. Quantities by Mr. Bolton:—

Tozer.....	£2,019 8 0
A. J. & Son.....	3,672 19 0
Lifford.....	3,814 0 0
Greenwood & Son.....	3,389 0 0
Reheine & Mount.....	3,258 0 0
Mark Gentry.....	3,250 0 0
Parker.....	3,143 0 0
Burch & Moore.....	3,135 0 0
Garrud (accepted).....	2,993 0 0

For additions and alterations at the George Tavern, George-lane, Woodford, for Mr. Back, Mr. H. C. Cotton, architect:—

Belcher.....	£2,100 0 0
Robson.....	1,784 0 0
Laughton.....	1,869 0 0
Bunkle.....	1,814 0 0
Marr.....	1,807 0 0
Shurmer.....	1,584 0 0
Cooks.....	1,473 0 0
Yardley & Sons.....	1,493 0 0
Hewlett.....	1,405 0 0

For building eight villa residences, and one stable with rooms over, for Mr. R. Maynard:—

Vickery.....	£4,410 0 0
Gardner & Letch.....	3,880 0 0
Marr.....	3,925 0 0
Dalman Bros.....	3,200 0 0
Smith.....	3,200 0 0
Capey.....	3,120 0 0
Brightmore.....	2,908 0 0
Reed.....	2,840 0 0
Bagland & Thompson (accepted).....	2,635 0 0

For alterations at the Vicarage, Newton, Newgate-street, for Mr. Hublett. Mr. H. I. Newton, architect:—

Giddens.....	£250 0 0
Wood.....	339 0 0
Langmead & Way (accepted).....	329 0 0

For sundry alterations and repairs to No. 69, Pembroke-villas, Baywater. Mr. J. Johnson, architect:—

Dave Bros.....	£585 0 0
Faulkner.....	457 0 0
Stimpson & Co.....	445 0 0

For building warehouse, for Mr. Glover, Upper Clapton. Mr. Wither, architect:—

Shurmer.....	£483 0 0
Boyes.....	477 0 0
Harper.....	487 0 0
Wood (accepted).....	445 0 0







# The Builder.

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SATURDAY, APRIL 5, 1884.

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### On Architectural Style as the Subject of Architectural Proportion.



OUR former and introductory article (see p. 241, ante) on Proportion in Relation to Architecture, concluded with a reference to Bacon's dictum that principles obtained direct from particulars lend themselves most readily to application,—enter most easily into particulars again.

Let us, then, in the present paper make progress to confront our subject in the most concrete form, with a view to interrogating architectural examples of admitted excellence, and eliciting, if we may, in what sense or, indeed, in what further variety of senses, they are appropriately regarded as under obligations for their excellence to proportion. The distinction has already been indicated between the demands on considerations of proportion as dictated by mere usefulness and convenience, and those which are exacted by the more refined sensibilities of taste,—the conditions of elegance and of characteristic expression. Proportion, we saw, is at the basis of efficient utility and also of beauty, of whatever class or grade, and that it is also at the basis of an appropriate combination of the two. The proportionate claims of utility may in some cases reduce those of beauty to a minimum; when the deadly attack of an enemy has to be repelled by sea or land, the engineer may be excused who leaves aside all considerations of fine art in the plot and profile of his fortress, or the lines of his ironclad; he is as little to be blamed for the neglect, as to be praised for any beauty that the exigencies of the occasion may spontaneously develop in spite of it. In cases of less urgency, neglect is truly blamable; and if not more blamable, usually more lamentable, is the attempt at adding embellishment to utility,—to a bridge, a viaduct, a station, or a prison,—which often results in producing the offensive or inappropriate in kind or degree,—a gratuitous discord.

In other cases the proportionate claims of beauty are predominant, and utility is no more to be looked to for authority or suggestion, than in the design of a jewel; a monument or commemorative column may serve as an example, or even a minaret or a spire. When the work is finished, it may tell as ornamented construction,—but the scheme and design of the construction will be manifest enough as subordinate and secondary,—as suggested, in fact, by the requirements of the proper ornamental display.

In such instances, however, utility is still not without its rights; subsidiary as it may be, it retains a certain claim and power of self-assertion, its services being to some extent indispensable; and they must be employed legitimately or ill will come of it, and a fatal note of discord inevitably mar the harmony of the combination.

The first architectural harmony, therefore,—harmony which is always bound up with proportion,—is between the purpose of a structure and its degree and character of ornament; or conversely, if we please, between decorative character and constructive propriety. A harmony of this nature, equal in degree of accuracy, if not of delightfulness, may exist in structures which in style and object are most contrasted; it is to be recognised in a mansion as in a church; in a Greek temple as in a Gothic cathedral. But now to carry our analysis one degree further. It appears that both the useful and the ornamental elements of this architectural harmony are severally resolvable into a double root of what may be called qualitative and quantitative harmony; that is to say, in the interests of usefulness we demand a complete set of duly-contrived elements of combination, and then the due adjustment of these among themselves in respect of magnitude and dimension. A mansion, like a steam-engine or like a living organism, demands a variety of specially-adapted parts,—call them members, elements, what you please; and then the regulation of these by due proportion to each other.

And it is even the same with the parts and adjustments which determine that the structure is in one style of architecture and not in another, and in that style has a certain specific expression out of many equally possible. The ornamental members and their treatment must have a consistent relation to each other in kind, and superinduced upon this general fitness and propriety, a certain subordination to regulative proportion. That buildings may be of the same style, and even of the same general plan, but different in proportion, is nowhere more conspicuous than in examples of Greek architecture, where the difference of proportion seems sometimes to be the sole and entire, but that a momentous difference between one Doric temple and another. The harmony of proportions may be equally excellent or equally complete in either case, and we are then presented with the problem to elicit the principle on which the common excellence of contrasted development depends.

Buildings, again, may be of different styles, but coincident to a great extent in their proportional character. We know that important structures have been designed in general distribution, and only afterwards has the style been determined in which they shall be executed; certain ornaments and details of construction being changed from Gothic to Italian, or vice versa, at the last moment.

Style, then, may be realised with great variety of harmony of general proportion, but there is also a harmony of style antecedent to special variation, the essence of which is a certain appropriate coherence and consistency of characteristic features.

When we compare nearly related styles,—for example, two Greek styles, Doric and Ionic,—we see that though each favours a certain predominant cast of proportion, what determines their difference of style is difference in adoption or admission of certain details and modes of treatment of construction which follows one special type. The Ionic base or capital would disturb the Doric harmony, as the triglyph and metope would the Ionic. But such proprieties can scarcely have established themselves and vindicated themselves by general acceptance unless in virtue of some truth in nature, and thus we have the problem of harmony of style to subject to analysis before proceeding to harmony of proportion as variously applicable to various examples of the several styles.

When we compare two buildings which, although having a certain analogy, are not in nearly related but in contrasted styles,—the Sainte Chapelle, let us say, with the Ionic temple on the Lyseus,—we perceive that differences of styles equally in themselves harmonious, may extend far deeper than to mere diversity of ornament or details,—to very principles of construction, as to vaulting contrasted with trabeation,—to the difference between a column and a buttress, or between a simple external column and an interior compound pier.

Appropriateness,—the ultimate basis of harmony,—must have reference to the necessity or convenience of general purpose, or to expression,—a purpose after all, but an especial purpose; necessities of construction, of available materials, or known resources of construction, are conditions of one class, which will always affect the problem as they affected materially the differences between Gothic and Greek. But even traditional type exercises a certain authority as powerfully as if of necessity,—and has to be dealt with by the best modifications available,—to be reduced to convenience or evolved to elegance as invention or genius may give aid.

Between natural exigencies and tradition, the art of a nation inherits types from earlier ages, which usually include some vigorous germs of effective development; the development of these by art includes the reduction of them to conditions of convenience, and then to expression of dignity and grace, of whatever order, by giving emphasis,—not violent, but distinct,—to their proper functional character, severally and in relation to each other.

Thus it is that the definition of the kind, the variety, of architectural members and decorations which are brought into combination in a well-defined style, and the study of their natures as elements of harmonious design, are



considerations anterior to that of the principle of their precise proportions,—relative magnitudes and dimensions,—among each other in a completed work.

In the case of Greek architecture, material is to be regarded as marble, only supplemented by wood for ceiling and roof, and construction is dependent for spanning open intervals on the horizontal beam or the truss. The materials of Gothic architecture are smaller stones, and, in place of column, horizontal architrave, and truss, the constructional requirements present us with the pier, simple or compound, the arch, and the vault.

The Greek temple which we adopt as our illustration comprises, in the simplest form, the essential component elements of all architecture. In plan it consists of a main and even single apartment, with or without a vestibule and portico; in elevation, a sub-basement, supporting the wall-curtain, and beyond this the columnar portion of pure trabeate construction, and extended laterally by a peristyle, and a doubly sloping roof, out of regard to rainfall, covering the whole, and having even a certain spread beyond the supports.

We make a further advance towards definition with the observation that the seclusion, as well as the display, of a temple statue, decided the position of the entrance at the smaller end of an oblong apartment; that the pitch of the roof was kept decidedly flat; and that while the available length of average architrave stones limited the spacing of the columns, the diameter of these was kept subordinate to the free interval for passage-way.

Here, it will be observed, we touch inevitably upon considerations of relative dimensions, the proper subject of quantitative or proportional harmony, but only in the most general terms. As we proceed further, these are mixed up at every step, though still only generally, even with suggestions of which the propriety is mainly due to the æsthetic motive,—to characteristic expression.

As regards the general podium or stylobate: in accordance with manifest functional propriety, this has a continuous solidity, and a superiority of spread assigned to it, which expresses firm hold on the ground, gives intimation that the structure is set on the ground,—does not spring up out of it with an unknown buried depth,—and marks a large and simple general limit. It may be called the servile element of the composition, and is retained subordinate by relative lowness, while it raises the dignified structure better to view, and lifts it above the encroachments and contaminations incident to a level. In important structures the expression of solidity is not reduced by moderation condescending to accommodate the convenient height of a riser of a stair. This convenience is provided for by occasional intermediate steps, while the general disregard of it tells as an expression,—an assertion of dignity.

From the simplicity of the stylobate we proceed to the varied superstructure. It is a universal rule for the Greek column to diminish from below upwards; in no instance is this really essential to the stability of the column; but it is all important for the suggestion of stability that the centre of gravity of the mass should be manifestly low down, and that a certain degree of extra breadth should be given to the foot of the shaft. What degree of diminution shall be adopted is to be decided generally by sensibility to expression and particular variety of expression; precise regulation of the degree of diminution in all cases is the affair of proportionate adjustment. The expression favoured by Doric architecture inclines to one or more variety of the ponderous; the column is decidedly and appropriately stout relatively to its height; it diverges much more from the purely cylindrical form towards that of the frustum of a cone, than the Ionic column of lighter and loftier proportions. But since the Ionic column is thus deprived of the greater spread of the Doric, a new element,—the proper base,—is applied in order to furnish here also the requisite expression of foothold as contributing to stability.

The suggestion of the appropriateness of a capital, of general flat proportions as crowning member of the vertical column, is not far to seek; the soffit of the architrave is made broader than the diminished upper diameter of the column; and the still broader abacus or tile of this intermediate member is introduced to protect edges and bring down the distributed pressure. Why, it may be said, should not the

upper diameter of the column have been at least equal to the breadth for the support of which it is ultimately responsible? Even because the smaller dimension is not only equal to its responsibility, but because it is essential to the expression of dignity and grace that being so it should assert itself visibly.

Refinement of expression is obtained by keeping down the orde exhibition of even necessary construction and constructive details, and while keeping clear of any possible suggestion of inadequacy, avoiding equally any anxious demonstration of efficiency, and more than sufficiency. The intimation of sufficiency may be more pronounced in some cases than others; but in the finest examples of art, well-judged suppression goes hand-in-hand with the most effective expression.

It is to the decision with which the certain mean between the too little and too much is hit in the Greek column, that is due the impression which it conveys of something approaching to thoroughly healthy vital energy,—the very sense which we receive from contemplation of the tower and spire of Salisbury. A great task is effected, to all appearance, perfectly; but none the less so because we see that it is also effected with gracefulness, dignity, and ease. Nothing is more vulgar than an appeal to mere wonder,—the triumph of the acrobat and the conjuring trick,—the appeal to a *tour de force*. On the other hand, the mischief in effect is as bad when even necessary buttresses are forced remorselessly into view, as when unnecessary are crowded upon each other; the ultimate suggestion is invariably not of strength to support, but of weakness that cries out in its feebleness for such an excess of assistance as to betray original false design and ultimate liability to be hustled and crushed by officious interference,—by encumbering help.

There is the strongest presumption that Greece was debtor to Egypt for the suggestion of the flutes of the column,—flutes narrow and with curved horizontal section; the value of these in effect, especially as perfected by Hellenic genius, cannot be overestimated. The close vertical lines of the arrires have the usual effect of stripes when so disposed, of enhancing expression of tallness, hence of loftiness and lightness, and without detracting from vigour. The sharp definition of the edges as seen in profile, and relieving each other by varied presentation in perspective, gives emphasis to rigidity; by the ultimate refinement of entasis this enforcement was secured against the seeming "tightness" which offends in columns where this softening curvature is unknown. Flutes are essentially mouldings, and like other mouldings when under judicious reserve, they express a certain energy that is at disposal after specific function is provided for, but which manifests itself in subordination to the characteristic prompting of that function.

The Greek was careful not to range the drums of his columns with joints at corresponding heights, and thus falling upon horizontal lines: he had a good reason. The entasis was obtained by making the drums touch the adopted curve at upper and lower edges; but the profile intermediate was a right line. The general profile, therefore, presented strictly not a truly continuous curve, but a series of angles at the joints, and, minute as these were, they might have told in effect had they been repeated at the same heights in every column.

When we pass to the Doric entablature we have first the plain architrave, composed of stones, which span the interval from column to column, with joints accurately above the centre, where the lowest drums of the shafts break joint with the stones of the stylobate below. Covering the joints of the architrave stones, again, which are derivative from the wall-plate of structures anterior to colonniation, comes over a triglyph; this member has always been justly recognised as originally suggested by, as still covertly suggestive of, the end of a beam, which, in a simple structure, would extend across the apartment; the name of the interval between two such beams, a metope, implies by etymology that it was long familiar as an open interval, if not throughout, in certain places, and thus giving access for light and air. Passages from literature that have been often referred to fully confirm the inference.

There is no escape from the conclusion that to carpentry must be ascribed the origin of many other Doric details besides the triglyph, as well as the treatment of the triglyph. When

important buildings came to be constructed for the most part of marble, many leading proportions were wisely,—as, indeed, of necessity,—adjusted to the qualities of the different materials; but the inference is inevitable, from comparison of what monuments remain, that the characteristic Doric design, proportion apart, was due to the Greeks, and almost perfected by them, at a time when timber,—naturally most abundant in earlier times,—was used for structures wrought with well-studied symmetry and finish, and which took such hold on habits, or so justified admiration and sympathy, that the builders in marble had no choice, and even no desire, but to give a marble transcription.

The triglyph, true to the propriety of its derivation from the beam, is less broad than high; and thus, as a vertical member relatively to the horizontal architrave, it repeats, by a subordinate but not ineffective echo, the relation of column to stylobate. The analogy is reinforced by the grooves as differentiated flutes; and the triglyph has, moreover, a representative of a proper abacus. The beam seems to have been originally notched into the architrave, and of this the gutta-plate emergent below the architrave band appears to be a reminiscence. Perhaps the most characteristic member of the entire organism is the cornice, projecting for the definite function of carrying rainfall clear of the face of the structure. Any joint of this ledge in primitive timber construction would fall naturally above the centre of a triglyph; and the firmness of this joint, in the absence of a superior or blocking course, would have to be provided for. There is a difference of opinion on the point that cannot be ignored, but, at least, we may affirm a strong presumption that in the Doric mutule we have a reminiscence, decoratively developed, of the expedient of a mortise. That this flat feature can represent a purlin is quite out of the question; independently of its form, its slope on the underside of the cornice is different from that of the roof, with which it is brought into no connexion, actual or presumptive; we may more safely derive it from a flat and hard wooden plate or tongue, sunk into the substance of a cornice across the concealed, and projecting to cover the exposed, joint; the gutta then represent the treanils usual in timber framing; which, always arranged on either side of the centre line, fastened the free portion of the plates to the cornice, and contributed with the mortise to combine it into a single frame.

In the temple at Bassæ the cornice-stones have their joints covered by a sunk course above them, on which the rafters take their bearing, and in doing so help importantly to confirm solidity. In the earlier temple at Ægina, a smaller stone is sunk into the cornice-stones from the top crossing the joint, and has the same function as the assumed primeval mortise. These motives of decoration, when once appreciated, were made the most of by systematic repetition and equality of spacing of both triglyphs and mutules.

A cornice, according to its proper typical conception, is a shelf or ledge of such projection as to deliver rain-water clear of the face of the building and foot of the wall; for this to be performed effectually it must be so undercut that moisture which may cling about its surface shall be prevented from being drawn back by molecular attraction and reaching the surfaces required to be protected and the constructive joints. The Doric cornice slopes upward on its under-side in a right line, but is also undercut on the lower edge of the corona, so as to have an effective drip, and the cornice then has its own quasi-cornice, the face of the corona being surmounted by a string-course or curved drip,—the so-called bird's beak moulding. This combination was a genuine product of Hellenic art, under no obligation to Egypt or Assyria; by comparison of early types, Etruscan, Italian, and Sicilian, as well as of Greece proper, we see that it was only perfected by degrees; it appears to have been obtained in the first instance by throwing forward to a right angle, horizontally, the erect Egyptian cornice. Even long after it was fully developed qualitatively, there remained scope for perfecting taste in adjusting the relative quantities of its parts. It is remarkable that one of the first signs of refinement in the development of Gothic architecture is seen in parallel recognition of climatic requirements, in growing appreciation of the characteristic value of the proper drip-moulding, which is wanting in the Norman style, and only by degrees declares and asserts itself in Early



English, before it becomes supreme and indispensable in later elaborate profiles.

It may seem whimsical at first to declare that a true analogy exists between the theory of the profile of a Greek order of architecture and that of a beautiful human face; but it may prove justified on examination. The Greek facial profile and the Greek architectural profile declare an equal responsibility to the exigencies of common exposure to external influences,—to incidental moisture and to impact of slanting sunlight. The cornice, protected by its drip-moulding, protects by its under-cutting the frieze and entablature generally, and wall or footing of the column, as it may be, below, by its general projection; the abacus of the column, again, projected on the stylobate, more than covers its base; the cymatum of the pediment projects even beyond the horizontal cornice, and, moderately as this may be, gives emphasis to the design of protection to the entire façade. So, in a well-proportioned finely-drawn human profile, the thatch of hair keeps off moisture from above, and the penthouse eyebrow protects the eye from sweat descending from the forehead; this motive is repeated in eyelid and eyelashes. Who has not found that the offensiveness of external windows without hood-moulding or dressing is enhanced by suggestion of the unhandsoneness of a face in which the eyes lack protection of shadowing forehead or visible eyebrows? Even apart from moustache, the slight projection of the upper lip gives protection to the mouth from incidents from above. The chin, again, is slightly retired beyond the line of the lower lip, though, with beard to aid, it continues the motive of protection relatively to the throat.

#### ON WINDOW BLINDS AND SHUTTERS.

THERE are several of the internal fittings of a house which, though of less importance than the blinds, obtain greater attention. Yet the blinds of a house are largely concerned both in the comfort of the inhabitants and in its external and internal appearance. Closely connected also with the blinds are the shutters, and these, especially at the hands of the speculating builder, receive very scant attention; indeed, it is always possible, one may say, to know a speculating builder's house by the way in which shutters are ignored. Let us deal with these latter first. We hold that the reception-rooms of a house should always be provided with shutters. In cold weather they add largely to the warmth of a room, and in some, especially in situations which may not be of the quietest, they do much to lessen the sound proceeding from external noises. They also add to the security of a house, not only directly, but indirectly, by affording the means of easily attaching bells and other alarms. Yet, as we have already said, it is really astonishing to see the number of new houses in which they are omitted. When once this is done it is very rarely that they can be added in a satisfactory manner.

Blinds, indeed, which we next touch upon, are, though so essential, yet in some way or other left very much to the whim of the decorator, however well worthy of careful attention by the house-owner. For example, the way in which persons allow inside Venetian blinds to be put up is astonishing. For when this subject gets a little attention we doubt if any reason is to be found for the way in which this kind of blind is put up. They are, in the first place, expensive, and this at once is a drawback; and they do not protect the glass from the sun, which is necessary to keep a room cool. Can any one say that they add to the picturesque appearance of a room, or to its look of comfort? On the contrary, there can be no doubt that they are ugly and cold-looking, and if a window gives forth a draught,—and what window does not let in some air?—the draught is always felt through the chinks of Venetian blinds. Further than this, they give extra labour to servants, and are often calculated to do harm to the many ladies who have from time to time to pull them up; especially those which overhang large dining or drawing room windows. Another domestic disadvantage which pertains to Venetian blinds is that when they are at all large children may often do themselves a serious injury by letting them down with a rush on to their heads. Probably this idea occurs to few when they put them up, but there is no doubt

that it is a real and practical disadvantage to them.

Therefore, for internal use, we have no hesitation in saying that the best kind of blinds are those made of some kind of tick or similar material. Here, again, however, we cannot commend the aristocratic, plain, white blind, at least, in a town; we say aristocratic, because if any one will take a walk through the most fashionable parts of London, such as Belgravia and Grosvenor squares, he will observe that this kind of blind in various stages of discoloration is in the majority, whilst if he goes through some terraces of Kensington he will notice in window after window green or gray Venetian blinds. But the whole red blind is not the one to choose, for it fades, and, therefore, among the colours which are made, those with some kind of buff ground, or of any neutral tint, are the most serviceable. More may yet be done in the way of improving both the colours and the patterns of blinds, and more also may be done by the inmates of houses in seeing that not only do the colours but the ornaments of a blind harmonise with the character of the room. For example, a border of lace at the bottom will add to the grace, so to speak, of a drawing-room blind, and be in harmony with the niceties of the ladies' room, and there are few better blinds for a handsome drawing-room than the festooned ones, albeit they cost more per square foot than the simpler kinds. On the other hand, lace may seem altogether out of place in the severer library. Having, therefore, made these observations on the subject of inside blinds, let us touch on those outside the house for the purpose of protecting the inmates of a house from the sun. Here, if you like, there is not much to be said against Venetian blinds, and they have the great advantage of being capable of regulation so as to modify or increase the light, whilst the ordinary outside blind gives the same amount of light at all times. On the other hand, the Venetian blind is an enemy to window-gardening, and many is the handsome geranium whose scarlet head has suffered from the ruthless blow of a Venetian blind let down by a careless servant. For our part, we are a good deal in favour of outside wooden shutters, which are too much neglected in this country, perhaps because they are so simple, and which appear to us to cost in London more than they should. They can be regulated so as to admit various amounts of light, they have no strings to break, nor springs to get out of order. When summer returns they do not come forth dilapidated or torn, as often does the ordinary outside blind. For a few shillings any painter will give them a coat of paint and make them look bright and fresh, and any competent carpenter should be able to make them. Therefore we regard them as amongst the best and most economical kind of outside protection from the sun, because even if in the beginning they cost as much or more than outside Venetian or tick, yet they will last for a long period of time, and our friend the speculative builder should have more pressure put upon him to put up these useful and necessary appendages to all houses with sunny aspects.

#### THE SITUATION OF THE INDUSTRIAL ARTS IN FRANCE.

CERTAINLY no one has reason to complain in the present day of the want of interest taken in matters relating to art; there are, indeed, not a few who are disposed to believe that too much attention is paid to the subject; we need, however, in no way allow ourselves to be influenced by such carpers, for we owe to the movement in favour of the arts a sensible advance within the past generation,—an advance not only of artistic, but commercial, importance, the ultimate results of which it is impossible to foresee. But it is not alone in England that this revival is remarkable; both in the New and in the Old World the activity is the same. The balance of power is being slowly disturbed, and countries that once held undisputed the highest place, find themselves now in hot competition with countries which formerly relied upon their aid and their dictation.

We have more than once had occasion to refer in these columns to the unbiassed acknowledgment on the part of foreigners of the advance made by England in her industrial art products. Successive international exhibitions have allowed the experts to mark the stages of this progress since the great 1851 Exhibition in Hyde Park, and it has ungrudgingly been admitted that our

country owes to the energy of its manufacturers and the influence of its art-schools and museums the daily growing power of competing with nations which have till now considered themselves beyond the range of rivalry. Once more the cry of alarm has been sent forth by France, which grows daily more and more disturbed at the serious competition she finds in the markets of the world. This time it is our respected Parisian contemporary, the *Gazette des Beaux Arts*, which, in an article entitled the "Actual Situation of the Art Industries of France," sets forth the commercial importance of the question. For this, let us hasten to repeat, is the point of view from which a very large class regard the modern art movement. Aesthetically there are not wanting those able and willing to tell us much concerning the refining influences of art. There are not wanting the optimists who look forward to the day when all around us shall be beautiful, as they are so fond of stating, erroneously, was the case in the past; there are not wanting, again, the pessimists who despair of the spread of the understanding of beauty, forgetting the refining influence of the education to which they owe the power of being able to have an opinion on the question.

France, after reposing quietly on her undisputed reputation for taste, is commencing to discover that, if her reputation is in no way lessened, its commercial value is being undermined by the competition of other countries.

The reports selected by our contemporary we feel sure many of our readers will be interested to see reproduced, bearing, as the information does, on some most important industries. In the report on the carpet trade the commission states "frankly the success of our foreign competitors; we have called the attention of French manufacturers to the very serious competition with which we are menaced by the American carpet houses." In goldsmith's work "it results, from a lengthy examination, that if France still holds the first rank in this industrial art, immense progress, artistic and technical, is being made abroad, where houses have existed in Russia and in America for the last twenty-five years and more. To what to attribute this success? To the aid of the artists we have lost from causes difficult to state? To the frequency of the exhibitions held? The greater part of the progress made must be attributed, without doubt, to the foundation of schools of design, formed and supported by the heads of important houses, and to the emulation kept alive in these schools by means of competitions and prizes. The creation of well-arranged museums can only have advantageous results for the artists, the workmen, and the public, who are accustomed to see and to understand without effort the beauty of a work of art." In the furniture trade, the reporter observes that "the grand medal awarded to England is a lesson that should not be lost for France, and the progress made by other nations should urge us to make great efforts; there is not a moment to lose, and the reporter counsels the creation of an industrial museum and of special schools." "Every one remarked in 1878," states the report on the glass trade, "that several foreign nations had made great progress in many of the industrial applications of art, where France, reposing on the superiority which no one yet contests, has only slowly advanced. The mean level is very high, but nothing shows with our manufacturers the desire to arrive at results comparable with those obtained in the past. If the national taste exists, it is too often commonplace, and style is wanting. These general considerations apply to the greater part of the arts connected with the glass trade. In spite of the beauty of their products, we counsel the French glass-makers to especially look at the progress made by their English brethren. The English makers have profited largely by the industrial art instruction of the South Kensington schools. The Bohemian glass of 1878 was an evident progress on that exhibited in 1867. As in England, the trade is now in the hands of skilful designers who have given it a fresh beauty and variety." The report on jewelry declares, that while France held incontestably the lead in 1878, "too many of the foreign jewellers were unrepresented for the real progress made abroad to be appreciated. As to Italy, which has retained the traditions of the art, it holds high its position, its success being attributable to the efforts of Signor Castellani, to the art-schools of Naples and Rome, and the study of antique works and the processes



employed by the old jewellers. The study of classic models and the return to the processes in use in antiquity have raised the level of the art in the different provinces of Italy, and brought about a sensible change in the productions of the jeweller's art throughout Europe." The report on bronzes states the considerable progress made industrially by Austria within a few years past. In silk (brooches and other) "we have," says the report, "to state the existence abroad of models of correct design and shades assorted with a taste which at previous exhibitions had not been noticeable. We have concluded, and the supposition is correct, that after having taken our models, our artists had been used. In examining attentively, in the Exhibitions of 1855, 1867, and 1878, the productions of the English houses, we are convinced we are in the presence of an undoubted national progress. It would be useless to attribute this advance to the employment of French artists and workmen. If it is by these means the English have commenced the struggle, they have simply acted as serious competitors. We could not, however, do ourselves greater injury than to underrate, through pride and conceit, a fact which should cause us to redouble our efforts."

Custom-house returns, with their stern logic of figures, show that the competition of foreign nations with France is not alone confined to mere artistic superiority. Reduced to the smallest number of figures, it may be stated that the exportation of works of art from France in 1879 fell short of that of 1869 by some 5,000,000 francs, or 240,000 sterling. In 1878 it may be mentioned that the French exported to us something over 183,500 kilogrammes (or 183 tons) of art-bronze work; in 1880 only 80,700 kilogrammes, and this diminution is noticeable in every detail; the importations are increased in the same measure; the importation into France of pottery and porcelain, which in 1869 represented only 353,000 francs, in 1879 exceeded 1,500,000 francs; in plated goods an increase of 70,000 francs is stated, and so on.

The French, in admitting this position, naturally ask the reason of the encroachment of foreign nations on what they have so long considered as their preserves.

#### SOME PRACTICAL NOTES ON BUILDING WOODS.

It is hardly to be expected that architects should be possessed of anything like a full knowledge of the ever-changing conditions of the great trades that supply the materials for the carrying out of their conceptions, and yet a timely recollection of the fact that the courses of such trades must be continually undergoing changes is most requisite.

It is but a few weeks since that a gentleman, possessing doubtless an excellent architectural knowledge, when reading in public a paper on building materials, is reported to have remarked,—"I prefer Stettin to Swedish firwood; it is less liable to dry rot."

Now, the absurdity of such a remark is very clearly apparent to any one having the slightest knowledge of the wood trade, and coming, as the words did, with the voice of authority, they are calculated, if they be not corrected, to add to the existing misconceptions regarding building woods, which are already far too numerous. A very slight knowledge of the wood trade is sufficient to assure any one that Gefle, Soderhamn, and many other Swedish ports, supply us with the very best building woods we have, and that Stettin does not supply us with any building woods of consequence. It supplies us largely with oak logs. Further than this, any firwood shipped from Stettin could not, through the geographical position of the port, be otherwise than of most indifferent quality.

The building woods of commerce may be separated into two divisions. First, those that are grown in the Old World; and, secondly, those that are grown in the New World. Europe supplies fir-wood, which the trade conveniently divides into two classes, viz., redwood and whitewood. North America supplies us with three principal building woods, viz., yellow pine, pitch-pine, and spruce.

We will take in hand the European woods first. That is, redwood and whitewood. It is the custom with some architects, who have only an imperfect knowledge of timber, to give in their specifications no more complete definition of the

sort of timber they require to be used in a building than is afforded by such terms as "fir-wood" or "Baltic fir-wood." Now, "firwood" may refer to either redwood or whitewood fir, and there is, both in quality and value, a wide difference between the two woods. "Baltic firwood" may refer to any firwood that passes in its course to this country through the Baltic Sea. Such vague definitions, therefore, as "fir-wood" or "Baltic firwood" are practically meaningless, and, as the generality of builders know this perfectly well, those architects who are in the habit of employing such meaningless definitions are pretty certain to have their knowledge of wood estimated at a very low standard by those they employ to carry out their designs. There are other architects who specify what may be put down as unknown woods, and again there are others who specify woods that are so unsuitable that were builders to employ the woods specified they would give cause for loud complaint. Such a case would occur if Norway timber were used in many cases where it is specified.

In Norway, nearly all the best wood, and there is very little good, is selected out by the planing-mills for the purpose of being made into flooring-boards. Consequently, Norwegian prepared flooring-boards are usually made of pretty fair stuff. Yet, although the flooring-boards may be "clean-looking" and "viewly," the wood itself, although carefully selected, is not a lasting timber, and the lengths of the boards are usually short, and thereby waste is incurred. When we come to the "economies of wood" we shall take occasion to point out why short lengths in flooring-boards are disadvantageous. With the exception of the flooring-boards that are planed in Norway, almost all of the sawn wood shipped to us from that country is of indifferent quality. This arises mainly from the fact that the trees of Norway, probably in consequence of the absence of a sufficient depth of soil in which to grow them, are of more or less stunted growth. The trees are occasionally long, but they rarely girth well. The Norwegian sawn deals that come in any sizes larger than 3 in. by 7 in. are almost always more or less in that state of partial decay which is known as being "foxy," and in those rare cases where no sign of decay is traceable the wood is usually coarse in quality and full of knots. The redwood from Norway is always sappy, because the trees cannot reach that stage of development in which the sap departs from the largest and central portion of the tree, and so leaves a quantity of perfect or matured wood.

Another fault of much of the Norwegian wood is that it is liable to be affected with "cross shakes," and when these occur its utility for bearing purposes has, of course, departed. Taking it as a whole, therefore, Norwegian wood at its best may be said to be fitted only for teneament or other cheap property, and our advice to architects is that, because spruce can generally be bought as cheaply, never at any time to specify its use.

It may be unknown to some architects that all the European building woods acquire their titles from the name of the ports whence they are shipped, irrespective of the district or forest in which they may have been grown. Thus Gefle deals are so called because they are shipped from the port of Gefle, and Archangel deals because shipped from the port of Archangel. The wood-producing countries of Europe are Sweden, Russia, Finland, and Norway.

The climates of all these countries are favourable to the production of the best firwood trees, which require a long cold winter, during which their sap lies dormant, to be followed by a short, hot summer, during which the wood-making process rapidly proceeds, for their best maturity. Soil, of course, is also a consideration, and it is mostly because there is an insufficient quantity of it in Norway that the trees of that country produce but indifferent wood. In Sweden the best building woods are shipped from those ports situated on the coast of the Gulf of Bothnia that lie between latitudes 58° and 62°, such as Gefle, Soderhamn, Ljane, and Stockholm.

The best of the Russian and Finnish woods are those shipped from Archangel, Oleg, St. Petersburg, Bjorneburg, and Wyburg. The Norwegian woods vary very little in quality. They are all of indifferent quality, and we have already referred to them at sufficient length.

It might be possible, perhaps, to name fifty places whence redwood and whitewood deals are shipped, and therefore it is quite useless

for architects to attempt to give precise titles to the woods they wish to be introduced into their buildings.

It is always best to use redwood for joisting and roofing purposes, because the resin that redwood contains renders it far more lasting than either whitewood or American spruce, and it is unwise to introduce either of the two latter woods at any time, excepting where cheapness is the sole desideratum; architects should therefore simply define in their specifications that the wood used shall be "Swedish or Russian redwood, of good quality." They have every protection that they can obtain, or even desire, in such a definition, and by the terms we have given they make it clear to the builder what it is that they do require.

Our redwood log-timber we receive mainly from Memel and Dantzic, and from several places in Sweden. The Memel timber is the best in quality in every respect. The Dantzic logs are larger in size, and longer in length than the Memel; this, therefore, and their cheapness, cause them to be generally resorted to. The Swedish hewn logs are often of fairly good quality, but they are smaller in size than Dantzic or Memel. When not required to exceed 12 in. to 13 in. in size, and 25 ft. in length, the Swedish logs are useful on account of their comparative cheapness. They are, however, a little prone to decay, and the Dantzic timber is better grown and is a more lasting wood. As we have remarked, Memel timber is the best of the three, but it is also more expensive, and it is sometimes difficult to meet with it in large enough sizes or in long enough lengths.

Passing on to American woods, we have first to consider yellow pine. This wood comes over both in logs and deals, and both are used for joinery purposes. Pine deals are, however, never used for bearing purposes, for which they are unsuitable altogether, but the logs are often used for beams, and, previously to the general adoption of pitch-pine, they were frequently brought into service.

The advantage of yellow pine logs for the making of large beams is that they are much lighter than are pitch-pine logs, and they also taper much less. Thus yellow (or white) pine logs are often employed where a great distance is required to be spanned. Yellow pine possesses more tenacity than pitch-pine, the strength of the latter-named logs sometimes being affected by the tapping process they are subjected to in the collection of their resin. This sometimes so weakens the logs that, under a pressure suddenly applied, they have been known to snap. Unquestionably yellow pine is the most suitable wood for inside joinery purposes, and it should therefore always be specified for the making of inside doors, mouldings, skirting-boards, &c. The advantages associated with its use are that it is capable of receiving a higher state of finish than either redwood or whitewood, and it warps less and is less affected by heat than either of the latter woods. Of all the known woods pine takes paint the best. There are several sorts of inferior pine deals, such as Miramichi and Richbucto pine deals, so called from the ports whence they are shipped; but these shipments are immensely inferior to the Quebec pine deals, and, therefore, when pine is desired, architects should clearly specify that all the inside joinery work of their building shall be manufactured out of Quebec yellow pine, of good quality.

Pitch-pine varies very little in quality, and it is mostly of good quality. It is also a very cheap wood. No other wood possesses so few (other than what may be termed natural) defects as pitch-pine. The logs when cut into nearly always open sound and clean. They reach this country in two forms of manufacture, viz., in a hewn and in a sawn form. The natural faults of pitch-pine are that it is heavy, that it tapers very much, and that it lacks tenacity. The sawn logs, of course, have not the fault tapering. American spruce comes only in the shape of sawn deals and battens. It is a good weight-carrying wood, and it is a cheap wood; it also comes forward abundantly in useful sizes. Doubtless the immense yearly importations of spruce into this country have been, and are, likely to continue to be of the greatest service. In the large industrial towns of Lancashire, spruce is reckoned, on account of its cheapness, to be the most desirable wood that can be employed for the joists and roofs of factories.

Placed in such positions, where the air is usually dry, it may, and indeed it is said to, supply every requirement demanded of it.



There can be no doubt that spruce is a tenacious and excellent weight-carrying wood so long as it retains its soundness. Our experience of spruce, however, is that it is likely to rapidly decay if it be placed under conditions that are in any way unfavourable to wood retaining its soundness. Some architects specify spruce for the flooring-boards of factories and outgate-tenements. In those districts where the operatives wear wooden clogs and hob-nailed boots it is a most useful wood for flooring purposes, on account of its tough hard-wearing nature. The softer white-woods of Sweden, Norway, and Russia are of much finer quality, but they are desirable only for floors that are intended to be protected by a covering of carpet or other similar material. The choice of woods intended to be used in a building must, for the purpose of securing economy, of course be largely regulated by geographical considerations. Some ports, like Liverpool, for instance, are to be regarded as purely American ports, and at the towns, therefore, in the vicinity of Liverpool American woods must be mainly employed.

We have not desired in this paper to offer any extended remarks concerning the suitabilities of the various kinds of building woods imported, because, beyond defining the species of wood required by such general terms as redwood fir, whitewood fir, American spruce, Quebec yellow pine, Canadian pitch-pine, &c., we do not think that architects would or could benefit themselves. The selection of the timber, further than the species required, should be left to the experience of the builder, aided, as it will be, by the knowledge he will have of the ever-changing conditions of the timber markets. To trespass upon the domain of the trader is no part of an architect's profession. A knowledge, however, of the technical or trade names by which the different species of building woods can alone be recognised, is an imperative necessity to architects; for, in the absence of it, complete ambiguity is likely to characterise their woodwork specifications.

#### "ART NEEDLEWORK."

The following lecture, by Mr. Alan S. Cole, was delivered at Nottingham on Tuesday evening, March 22nd, to a large audience, at the School of Art, when Mr. Councillor Jacoby presided.

In order that there may be an understanding between us upon the subject of this lecture, which is announced as "Art Needlework," I think we should consider the meaning of the term, "Art Needlework." Needlework speaks for itself,—it is work of the needle,—and cannot be better elucidated by another term. Art, on the other hand, is not so clear in its meaning. Art, to begin with, is a substantive and not an adjective. We have all sorts of arts,—the literary arts, the arts of speech, the arts of the stage, the art of cookery, the art of painting, of carving, of enamelling, of pottery, and others. We hardly, however, should speak of art-painting or art-carving, and yet art-needlework has acquired a meaning which at least has become familiar to us, even if we do not precisely understand it. The fact is that in speaking of art-needlework we want to distinguish an ornamental and decorative needlework from needlework for making clothes,—of which we are accustomed to speak as plain needlework. Plain needlework, in truth, is just as much an art (in what I believe to be the real sense of the word) as ornamental needlework. The word "art" relates to handicraft, workmanship, and acquisitions or qualities obtained by study and pains. It is the generic term for such human attributes in the abstract, and does not convey any qualifying sense. Art does not of itself mean anything beautiful or adorning. Nevertheless, a vague use of the word has grown up, and from a noun it has been perverted, with laxness, into an adjective. Art-needlework is doubtless an economical expression for applied ornament worked with a needle, and so long as we have a really clear idea of the meaning of the expression, it may, perhaps, be discreet to make use of it. With these few preliminary remarks, I venture to approach my subject.

A single discourse upon ornamental needlework must necessarily be but very general. The subject might be discussed solely with regard to the persons who have practised the art, conjuring up fanciful anecdotes of the competition between an over-confident Arachne and an unsurpassable Minerva, or we might prefer to consider the materials which have been used, what they were, how, and when, and where they have come into use, and in this way enter into a long dis-

quisition upon the silks of Cathay, the golden kinobos of India, and the flax of Egypt. Again, the styles of patterns and designs is another wide subject, embracing a survey of ingenious productions from Bezaliel and Aholiab of Biblical history, down to Mr. Burne Jones or Mr. William Morris. Further than this, there is the question of stitches and such like, of which a considerable number are alluded to in Italian, French, and German pattern-books of the sixteenth century. The ethnographical, the material, and the technical aspects of the art, may each afford matter enough for a separate lecture. However, in the attempt I am about to make, I shall endeavour to touch upon a few points in each of these several divisions, bringing my remarks into a sort of chronological arrangement.

In these days the needle is so commonplace an instrument that to try and put oneself into a time when people were without needles is as difficult as picturing people without such common necessities of life as houses, clothes, and food. And yet, from travellers' accounts of countries like the centre of Africa, the southern parts of South America and the arctic regions of Greenland, we learn that there are millions of people who are existing without any of the necessities of life as we know them. Their houses, their clothes, and their food, would be scarcely recognisable by us under those names. The history of the needle, doubtless, offers analogies of change similar to those respecting the things I have just mentioned. In the times of the Egyptians, bone and wooden instruments, like very coarse bodkins, are said to have been their needles. Weaving was certainly done then, and possibly some sort of stitchery. If we were to rely upon the words used by writers, we could be tempted to regard needlework as dating from Homeric times. But words by themselves are dangerous data to rely upon. The same word undergoes in process of time many modifications in meaning; and when one meets with a passage in Homer's "Iliad"—

There lay the vestures of an vulgar art;  
Sidonian maids embroidered every part,—

or that Helen of Troy's own fair hands embroidered certain work, we cannot assume that the word embroidery, or its Greek equivalent, 2,700 years ago, meant a work precisely similar to that which we now call embroidery. Birmingham needle-factories were not then supplying the world with millions of neat little packets of steel needles. However, there can be no doubt that the ancient Greeks possessed an art analogous in some respects to embroidery. If I had to express an opinion about it, I should incline to surmise that the decorative work of those times, which we are accustomed to in a loose way to talk of as embroidery, was a species of hand-weaving, and that a small shuttle of some sort was used for this purpose. Even when the metal needle was first used, I fancy the stitching must have been allied to darning or weaving. The primitive metal needle was a clumsy implement compared with any similar instrument used during the last 800 years. Still, a clever craftsman or woman could, with a small shuttle and fine threads, produce much noble work, of good texture and ornament. From the nature of the materials used, we cannot expect to possess authentic specimens of such works. Sculptures and paintings supply us with indications of early ornaments, which were probably inwoven into stuffs rather than embroidered upon them. Thus we may, perhaps, not very incorrectly conclude that the in-weaving by a small shuttle of coloured and golden threads, to make patterns, was the first form of ornamental needlework, and that this sort of work was akin to darning. It is not until the Middle Ages that we arrive at unquestionably reliable records of embroidery, like the stitching of threads upon a material as distinct from in-weaving or darning. From passages in the work of the late Rev. Canon Rock, a learned antiquary, who devoted close attention to liturgical vestments of the Middle Ages, and the characteristics of various textile fabrics, we may learn how the Phrygians in early classic times were renowned for their textile fabrics. With ingenuity which appearances seemed to strengthen, Canon Rock laid it down that these Phrygians were celebrated needle-workers, and that as they used gold threads, their work was called *auri Phrygia*. To this word he considered was to be traced the origin of the word "orphyrey" or the name of those handsome bands of embroidery which embellished Medæval copes, and are still in use in the Church as stoles. But this origin is possibly more fanciful

than strictly accurate; for, according to glossaries, MSS. of the thirteenth century speak of orphyres as being, as often as not, nothing more than golden fringes. The idea of an ornamental golden band or border for robes and costumes is as old as the Phrygians themselves, no doubt, but their work would, as I have suggested, nowadays be found to be quite distinct in character from the Medæval orphyrey. Many of the embroideries for orphyres dating from the best period of the Renaissance are truly golden works. In them occur representations of saints, frequently worked on to grounds of golden thread by twisting threads of fine coloured silks (somewhat in the manner of tapestry work) around the golden threads. The heads and hands are sometimes separately embroidered in a feather stitch, whilst the canopies and rich Gothic architectural ornament wrought in relief are obtained by couchings. Couching is a distinct branch of embroidery. It refers to the use of gold threadwork generally of a raised character. The indications I have given of the Renaissance orphyrey are, I hope, sufficient to mark the difference which appears to have existed between it and the flat woven or darning work of the Phrygians.

But what was the condition of ornamental needlework, between the Phrygian weaving period and the sumptuous Renaissance orphyrey? and how is that, as European countries developed we find traces of the same sort of art appearing at different periods of their development? These are two questions which open out a big field. If I may make a small attempt in this paper to give an answer to these questions, I must assure you beforehand that the answer must of necessity be only suggestive. Let us begin, say, with the time of Cæsar,—that is, in the early days of the first century. We are pretty fully informed by literature and history, recorded or monumental, that rich needle-embroidered costumes and hangings were not then largely used. It has often been thought, and romancers of the last 300 years have lavished on us wonderful pictures to stimulate our imagination in this direction, that the wealthy classes indulged freely in the use of gorgeously embroidered vestments. But the gorgeoussness was of a character which to modern taste would appear to be that of barbaric jewelry. The splendour of a triumphal procession in the third century through Rome does not partake of the nature of that sumptuousness of effect, and greater specialising of arts, which we can realise as existing in an ecclesiastical ritual of the fifteenth century, in a ceremony like the marriage of a Venetian Doge with the Adriatic, or in a Maximilian triumph. In all the last named we seem to be suffused with brilliant colourings, beautiful and varied stuffs, woven, sumptuously embroidered, all sorts of richly-worked, enamelled, and jewelled dainty articles, like priests' rings and seals, fine belt-buckles, hat-badges to fasten plumes, brooches, daggers and sheaths, and what not; whereas, turning to a procession like that of Aurelian, even the great historian, Gibbon, can only supply us with a picture of an overwhelming expression of a conqueror's power and spoils, and with no indication hardly of the delight of people in works of dainty handicraft and delicate forms. I must illustrate my allusion by a quotation. Gibbon writes:—"Since the inundation of Rome no general had more nobly deserved a triumph than Aurelian; nor was a triumph ever celebrated with superior pride and magnificence. The pomp was opened by twenty elephants, four royal tigers, and above 200 of the most curious animals from every climate of the North, the East, and the South. They were followed by 1,500 gladiators devoted to the cruel amusement of the amphitheatre. The wealth of Asia, the arms and ensigns of so many conquered nations, and the magnificent plate and wardrobe of the Syrian queen were disposed in exact symmetry or artful disorder. The ambassadors of the most remote parts of the earth, of Ethiopia, Arabia, Persia, Bactriana, India, and China, all remarkable by their rich or singular dresses, displayed the fame and power of the Roman Emperor." "The victories of Aurelian were attested by the long train of captives who reluctantly attended his triumph, Goths, Vandals, Sarmatians, Alemanni, Franks, Gauls, Syrians, and Egyptians." "Every eye was fixed on the Emperor Tetricus and the Queen of the East. The former, as well as his son, whom he had, created Augustus, was dressed in Gallic trousers a saffron tunic, and a robe of purple." The



beautiful queen almost fainted under the intolerable weight of her jewels. This extraordinary procession commenced its progress with the dawn of day; it ascended the Capitol about the ninth hour; and it was already dark when Aurelian himself returned to his palace. I do not think that we can feel that this sort of display could have engendered joy amongst a populace the majority of whom stood in awe of the opulent and governing classes. Their feelings in regard to fine and valuable things are more closely exemplified, perhaps, in the Roman soldier, who, finding a leather belt studded with precious stones, preserved the leather and threw away the stones. The poorer classes were utilitarian in character, without appreciation of the beautiful. The wealthy, on the other hand, who liked to surround themselves with all sorts of valuables from Egypt, Persia, and elsewhere, seem to have done so more from desire to satisfy their vanity than from any real liking for the beauty of the works they collected. Popular enjoyment of beautiful works is a phase which, perhaps, more distinctly arose in the fifteenth century than at any other time within the last 1,900 years. However, from the inability of pampered natures to retain their property and positions, Roman luxury declined; and as the peoples she had conquered began to throw off the yoke of conquest, and to assert their independence as communities, the way was being paved for the development of popular pleasure in art, for the development of crafts into which the use of patterns entered, and for a growth of domestic art, or a taste for "art at home," such as we are now accustomed to. Of all the arts, none, probably, is so domestic in spirit as embroidery. Wherever communities, and especially those favoured with a quiet temperament, as in nunneries and monasteries, established themselves, embroidery seemed to be one of the natural artistic occupations. A similarity of taste in this direction, arising as it certainly did, all over Europe, from the sixth and seventh centuries onwards, may, I suggest, be traced to the characters underlying cosmopolitanism of European nations. We seem to get a glimpse of how this cosmopolitanism came about, when we remember that the Roman empire at one time meant from far north of this town of Nottingham, right down to Italy, across the Mediterranean to the African coast, and from beyond Asia Minor close by Persia, right across Central Europe, along the Danube, up the Rhine to the west of France. If we can realise that this immense extent of country was subjected to similar governing forces and influences, and that "where the Roman conquers he inhabits," by which we may assume that he implanted his habits, social and otherwise, then, I think, we need not be greatly surprised if we find close technical relationships in arts and likenesses in styles of designs, of which we may find evidences in Italy, Germany, France, England, &c. The minor variations, which may be detected in this cosmopolitanism, give rise to national styles of art, as they are called. Interesting as is the study of these styles, a study which is more or less the exclusive privilege of a few, it raises, I venture to think, a sort of obstruction to a full grasp and understanding of the history of art. Climates and customs are causes of modifications, and various temperaments prefer certain modifications before others. In considering an art, however, I do not think that the best view of it is obtained by merely limiting one's appraisement of it by certain shifting and conventional political or geographical considerations. We should always, I think, bear in mind the relations which have been established through warfare, commerce, and patronage by wealthy persons. An incident as to French commerce with the East in the sixth century occurs to me as providing us with an example of how the arts of one country have from early times been influenced by the arts of other countries. It has been truly said that "each nation needs what other climes produce." Now, in the French "Bulletin Monumental" we may note that Greeks and Syrians in the sixth century competed to supply France with woven silk fabrics. The competition was sufficiently spirited to lead certain of the Syrian merchants to establish a house of business in Paris for the sale of their tissues. And in course of time, just as many of our famous Germanico-London merchants do at the present time, these Syrians identified their interests with those of Paris to such an extent that one of them attained to the dignity of becoming Bishop of Paris.

There is another early cause for the discrimination of a more or less similar practice of the arts in European countries; and this is the gradual expansion of Christian ecclesiastical organisation. Gradually, after the Emperor Constantine's recognition of the Christians as a developing and powerful sect, not to be oppressed by cruelties in the arena, by martyrdoms or massacrings, the Church, as a Catholic institution, commenced its foundations of religious houses throughout Europe,—those very houses of quietude in which art could be fostered. These places were all chiefly influenced by one direction of thought. Councils decreed what the Church might or might not do, and from early times matters of taste in respect of the ornamental costumes entered into the solemn discussions held by councils. When ecclesiastical organisation was in its birth, such matters had little weight. But Christians were human beings, and the simplicity of their primeval services, no doubt, furnished a ground for a reaction in favour of something more attractive. In the fourth century, Asterus, a bishop of Damascus,—and it will be well to note that the Christians we speak of here were Orientals, with whom the love and practice of the arts seem to have been a birthright,—this bishop decreed the luxury of his time and the avidity displayed for the possession of vestments ornamented with flowers and figures without number, of lions, of panthers, of bears, bulls, dogs, and forests. In the mere mention of such ornamental details the imagination can easily picture rich Persian compositions, the like of which can be traced in many embroideries and weavings from the East. In the year 787 A.D. the second Council of Nicos ordained the making and use of ornate vestments.

If say you will think that I am digressing from our chief consideration of ornamental needlework; and that in placing these very general observations before you, I have not done much towards bringing together the links in the chain of ornamental needlework. The fact is, however, that there are but few authentic records of ornamental needlework until the eleventh century. We might turn to the various wall-paintings and mosaics of the seventh to the tenth centuries, and learn from their appearance, at least, that art-needlework of those times very much consisted of stitching precious stones on to stuffs. As I said, however, the eleventh century really furnishes us with a piece of true needlework. This specimen is the well-known Bayeux tapestry. From the way in which the work has been done, it is evident that progress in the use of the needle (which must have undergone changes from the shuttle of the Phrygians and the heavy bronze bodkin of the Romans) had been made. That the Bayeux tapestry should have been called tapestry is one of those misnomers due to loose description. It is not tapestry at all. It consists of over 200 ft. of linen about 2 ft. wide, and is embroidered with wools in simple and laid stitchery. It is a pictorial relation or panorama of the episodes connected with the intercourse which took place between England and Normandy at the time of Edward the Confessor; the mission of Harold to Duke William; the taking of an oath which Harold's false host compelled; and, finally, the landing of the Normans and the battle of Hastings.

A very careful *fac-simile* of this most remarkable needlework of the eleventh century was made by the Committee of Council on Education, and Mr. Fowke supplied a learned description of the work. I have here a small copy of the work, which, for much more than its interest as showing us a sort of needlework that could be done in the eleventh century, must appeal to all who care for the history of their country. Relics of richer kinds of embroidery may be found in churches. For instance, the Dean and Chapter of Worcester possess remnants of red silk embroidered in gold thread with effigies of crowned and sceptred kings, in convoluted scrolls, which date from early in the thirteenth century. At this period the style of ornament is what we call heraldic, and on the table lie photographs of important thirteenth-century embroideries, described in an inventory of Pope Boniface VIII. In those of the chasuble may be noticed the convoluting ornament and circular panels intermixed with heraldic figures, like the double-headed eagle, the griffin, a couple of parrots (indicating Oriental influence), not to mention figures of Christian saints, apostles, and others. Work of similar design and method of stitch

exist in France, especially at Bitvite, in the Département de la Manche, where is preserved an embroidered chasuble, given in 1253 by St. Louis to Thomas Helie. This is wrought in silks and gold thread, and the pattern is a lozenge diapering filled in with triple castles, lions, eagles, and fleurs-de-lys. At the South Kensington Museum is a very precious thirteenth-century embroidery, known as the Syon Cope. The numerous varieties of stitches employed for its production have been the study of many. Dr. Rook devotes over fifteen pages of close type to the description of this cope, and the real upshot of this must be that the needleworkers employed upon this great cope must have been possessed of a knowledge of stitching which can rarely be matched at the present day. It is entirely of English work. There are ordinary long and short stitches, a sort of chain-stitch or split-stitch, cross-stitches, like Berlin-wool work, and others. Dr. Rook laid down that the chain or split-stitch was the veritable "*Opus Anglicum*," but it appears that this identification of a particular stitch as the "*Opus Anglicum*" is rather a lubrication of an enthusiastic imagination. "*Opus Anglicum*" probably signified that the work was English, without special reference to any one stitch.

And here, perhaps, as we are on the threshold of taking note of the fullest expression of embroidery, I may make a few short remarks upon classes of stitches. Dr. Rook based his classification of stitches upon certain names which he found in Dugdale's "History of St. Paul's." Arbitrarily he translated the Latin word *opus* to mean sometimes "style," sometimes "stitch." And he framed a classification of needlework, in which the following were the principal names.

1. *Opus Anglicum*, which he considered to be the special name of a sort of chain stitch or split stitch; used in ecclesiastical embroidery for the representation of human figures in the thirteenth century.

2. *Opus Plumarium*, considered to be the usual general term for what is now commonly called embroidery. "The stitches were never laid," Dr. Rook says, "across but longwise, and so put together that they seemed to overlap one another like the feathers of a bird." Not inaptly, then, was this style called "feather-stitch" work in contradistinction to that done in "cross and tent stitch." The sort of stitch which we can imagine Canon Rook would have classed under "*Opus Plumarium*" are probably "long" stitch and "short" stitch; "stem" stitch, the usual "orewel" stitch, "satin" stitch. All these are in principle the same sort of stitch,—the threads in them do not cross one another, but fall lengthwise or side by side. The stitch is quite obviously distinct from any of the chain stitches in which a loop is the principal feature.

3. *Opus Pulvinarium*.—Under this heading Dr. Rook brought all the cross and tent stitches. The word *pulvinarium* relates to a cushion or pillow; and *opus*, in this instance, for some particular reason, is translated to mean "style," and not "stitch." Whichever it may be, it will be clear that here we have at least a name for another class of stitches,—the cross and tent stitches, which differ from both the chain and long and short stitches already mentioned.

4. *Opus Pectineum*. Dr. Rook thought was a kind of woven work to imitate embroidery. A comb-like instrument or *pecten* was, according to Dr. Rook, used. This is fanciful and pleasant, but not of technical value. Judging from the passage quoted by Dr. Rook from the "Dictionary of the Londoner," I think that *opus pectineum* was a name for a certain woven work rather than for a class of embroidery. It, indeed, has no real connexion with embroidery. If, however, we should retain Dr. Rook's names, then, perhaps, simple "darning" stitches might come into the classification *pectineum*; though "darning" stitches, it may be observed, are closely allied in character to "long" and "short" stitches.\*

**The Will of Mr. George Edmund Street, R.A., architect, late of 14, Cavendish-place, and of Holmdale, Surrey, was proved last week by Mr. A. E. Street, the son, the executor, to whom the whole of the real and personal estate is bequeathed. The latter amounts to 55,136l.**

\* To be continued.



## THE STREET MEMORIAL.

A MEETING of the Committee for erecting a memorial to the late Mr. Street, R.A., was held in the Central Hall of the Royal Courts of Justice, on Tuesday afternoon last, when H.R.H. the Prince of Wales, the Right Hon. G. J. Shaw-Lefevre (First Commissioner of Works), Sir Frederick Leighton, P.R.A., Mr. J. L. Pearson, R.A., Mr. Wells, R.A., Mr. Alfred Waterhouse, A.R.A., Professor John Marshall, F.R.S., Mr. A. W. Blomfield, M.A., Mr. David Brandon, F.S.A., Mr. John Whicheard, Mr. George Godwin, Mr. A. B. Mitford, Mr. F. W. Burton, and other gentlemen, were present. Mr. A. J. B. Beresford-Hope, M.P., presided.

Mr. Blomfield, the hon. sec. to the Committee, having read the minutes of the previous meeting,—

Mr. Beresford-Hope, after a few introductory observations, said:—The first business which devolved upon the sub-committee appointed at the last meeting was the choice of a sculptor. In looking all round the field we decided unanimously that the gentleman who combines the most qualifications for the work is Mr. Armstead, R.A. Those qualifications (in addition to the genius and ability which he possesses in common with other sculptors) are chiefly these: his familiarity with Mr. Street, and the fact that, perhaps of all other living sculptors, he has most deeply studied sculpture in connexion with Gothic architecture. We therefore put ourselves into communication with him, and the result was very satisfactory. The place of the monument is, of course, an important element in the form which it is to take. The place which has been decided upon, by the permission of the First Commissioner of Works, is the panel behind us: consequently the monument will occupy a prominent place in this Central Hall, the chief architectural feature of Street's great masterpiece, where, I hope, it will continue to stand while the British Empire exists, and how long that will be I hope no one will ever have the temerity to say. Mr. Street's good fortune in being appointed the architect of this great building cannot intrinsically add to his fame as an architect, although it gave to him a public position and character which would otherwise probably never have belonged to him. We hope and believe that the proposed monument will be worthy of the man, of the place, and of the nation. It is a public monument in respect of its very appropriate location, but it is a private monument inasmuch as it is being carried out at the cost of those who loved and honoured him.

H.R.H. the Prince of Wales said:—Gentlemen, I have had the high compliment paid me of being asked to move the first resolution,—

"That the intended memorial shall be a mural monument, including a full-length figure of the late Mr. Street, and that it shall be placed on the east side of the Central Hall, in the second bay from the south end."

I can only assure you of the great gratification it gives me to have been asked to join this committee, under the presidency of Mr. Beresford-Hope, and I may add that I feel as deeply as any Englishman does how great a loss this country has sustained by the death of Mr. Street. His loss will, I am sure, be felt for a very long time. It has been a great pleasure to me to move this resolution to-day. I will not trouble you with any further remarks, as the resolution is to be seconded by my friend the President of the Royal Academy.

Sir Frederick Leighton said:—I hope I shall not be considered out of order if, in seconding in as few words as possible the resolution which has been proposed, I give utterance to the feeling which, I think, must be that of every member of this committee,—one, namely, of sincere gratification that the resolution which we have just heard has been placed upon the lips of the Prince of Wales himself. In the presence of the Prince of Wales with us here to-day we see another proof, if proof were needed, that when his Royal Highness lends his name to any object of public interest and concern, it is no mere idle and empty form, but an earnest of active and profitable co-operation. The Prince of Wales's presence with us is also a mark of that true and sincere regard for the names and memories of illustrious men which is, I venture to think, one of the most graceful characteristics of his Royal Highness's career. In seconding the resolution, my task is obviously, as a member of the sub-committee, a mere

matter of form, for, as a member of the sub-committee, I participated in their deliberations, and am jointly responsible with them for the conclusion arrived at. That their proposals have my warm sympathy I need hardly say. Your sub-committee had to consider two points: What was the most fitting form to be given to the memorial to be raised to the great artist whom we have lost? and, secondly, in what position could that memorial most becomingly be placed? They came to the conclusion that an effigy, life-size, of the master as he lived and wrought, should form a conspicuous portion of the memorial; and that the memorial should be placed in this hall, in which the greatest work of his life culminated, although he did not live to see it completed. They also determined to recommend that the memorial should not take the form of an isolated statue standing on the floor of the hall,—a space which they believed to be more fitted for sculptural adornment of another character and significance,—but they came to the conclusion that it should be enshrined in or embodied with these stately walls, with which his reputation has been built up and will live. I ask permission to add one word which will not, I hope, be an indiscreet anticipation of the next resolution, and that is, as to the artist to be selected. In view of the peculiar character of the scheme, I think it is matter for sincere congratulation that the sculptor whose name is to be brought before you is an artist not only of fine, vigorous, and manly gifts, but one who is specially conversant with sculpture used in conjunction with architecture, and from whose selection we may, therefore, hope for the happiest result.

The resolution having been formally put and carried,

The Right Hon. G. J. Shaw-Lefevre, First Commissioner of Works, said:—I have great pleasure in moving the second resolution, viz.:—

"That Mr. H. H. Armstead, R.A., be appointed as the sculptor to carry out the work, and that he be requested to prepare a model to be submitted to the committee at its next meeting, together with an estimate of cost."

I have no doubt that in selecting Mr. Armstead you will make a very satisfactory selection, for there is no sculptor of the present day whose work is more in sympathy with architecture than that of Mr. Armstead. I have not the smallest doubt, looking at his past work, that he will do ample justice, not only to the great building in which we now stand, but to its great architect. Although for many years I had the advantage of the friendship of Mr. Street, it was only during the last few months of his life that I was brought into official contact with him, but I saw enough of him and of his work to warrant me in saying that probably no building was ever erected on which genius and all the resources of intellect were more fully bestowed, and even lavished, by its architect, than has been the case with regard to these buildings. The ironwork and all the details throughout show the care and thought which have been bestowed upon them by their designer. No architect who ever lived was more self-reliant or less dependent on the work of others, and it is owing to this trait in his character that we have in this building that immense variety of detail and that simplicity and honesty of work which constitute so great a portion of its beauty. There are, no doubt, some who think that this building alone is a sufficient monument to its architect, and who would be content with some such simple tablet as that which, in the crypt of St. Paul's, records the name of Sir Christopher Wren as that of the architect of that grand building; but I think the committee have done wisely in determining to place a sculptural monument to Mr. Street in this his greatest and noblest work.

Mr. Henry Hicks Gibbs seconded the motion, cordially approving of the selection of Mr. Armstead as the sculptor of all others who could be most fitly chosen in this case to pay that honour which Sculpture could so properly pay to Architecture.

This resolution having been adopted, Mr. Beresford-Hope said:—There is one thing more we have to do, and I am sure we shall do it with great enthusiasm, viz., to thank his Royal Highness for coming here to-day and taking his part in this work, showing us how completely he realises and appreciates the privileges of his exalted position.

Mr. Blomfield, Mr. Arthur Street, and Mr. E.

Ball (of the firm of Ball & Sons, the contractors who have erected the Law Courts) were subsequently presented to his Royal Highness, and the meeting broke up.

## THE MOST ELEVATED BUILDING IN EUROPE.

HITHERTO the hospice of the Great St. Bernard, which stands 8,200 ft. above the level of the sea, has enjoyed the distinction of being the most elevated inhabited building in Europe. This honour it can now no longer claim. During the past year the city authorities of Catania, in Sicily, have caused to be erected, near the summit of the great volcano, Mount Etna, an astronomical observatory, which stands 2,943 metres above the sea-level, or fully 1,000 ft. higher than the Hospice of St. Bernard. The structure is 9 metres in height, and covers an area of 200 square metres. It consists of an upper and a lower story, and is built in a circular form. In the lower story there rises a massive pillar, upon which is placed the great refracting telescope. The lower story is divided into a dining-room, kitchen, and store-rooms. In the upper story there are three bedrooms, intended for the accommodation of astronomers and tourists visiting the establishment. The roof consists of a movable cupola or dome. From the balconies of the upper story a prospect of vast extent and grandeur is presented. The spectator is able to see over half the island of Sicily, the island of Malta, the Lipari Isles, and the province of Calabria, on the mainland of Italy. The observatory is erected upon a small cone, which will, in case of eruption, protect it completely from the lava-stream which always flows down on the opposite side of the volcano.

## HIGH WYCOMBE, BUCKS.

A COMMENCEMENT has now been made with the new Grammar School buildings for this town. The site is immediately in the rear of the ancient Norman Hall and Early Chapel, which are an interesting feature of the town, but which have been, after many years' consideration, found unfit for restoration or adaptation to the purposes of a grammar school. The new buildings will accommodate about 150 day boys, and the master's house, which is attached, is to contain accommodation for twenty boarders. The building will be constructed in white gault bricks and red dressings, and will be somewhat plain in character, owing to the extensive accommodation needed for the amount to be expended. The buildings comprise schoolrooms, dormitories, class-rooms, large common rooms, master's house on a good scale, and ample dormitory and other accommodation. The site is near the old turnpike road from London to Oxford. The contractor for the works, which are expected to cost nearly 5,000*l.*, is Mr. W. R. Loosley, of High Wycombe; and the architect is Mr. Arthur Vernon, of Great George-street, Westminster.

## THE PROPOSED NEW BRIDGE AT PUTNEY.

At the meeting of the Metropolitan Board of Works, on Wednesday last, the first business was to receive and consider tenders for constructing the new bridge, with approaches, over the Thames at Putney. Nineteen tenders were received, viz.:—

Lee & Son .....	£360,000	0	0
Williams, Son, & Wallington .....	349,000	0	0
Lowatt .....	319,701	2	7
Doherty .....	317,000	0	0
Martin, Wells, & Co. ....	296,000	0	0
Kellett & Bentley .....	293,800	0	0
Cook & Co. ....	291,000	0	0
Nelson & Co. ....	290,000	0	0
Hill & Co. ....	288,000	0	0
Mowlem & Co. ....	287,000	0	0
Turner & Sons .....	287,000	0	0
Perry & Co. ....	285,000	0	0
W. Webster .....	279,933	0	0
Pethick .....	269,444	0	0
W. Yates & Co. ....	264,468	0	0
Aviss & Co. ....	259,688	0	0
Nowell & Robson .....	249,000	0	0
Morrison & Mason .....	248,301	0	0
Waddell .....	240,433	19	0

The Board, having gone into committee on the subject, shortly afterwards resumed, and resolved unanimously to accept (subject to the usual inquiries) the lowest tender, that of Mr. John Waddell, who was requested to put himself into communication with the engineer, Sir Joseph Bazalgette.



### COMPETITION FOR THE VICTOR EMANUEL MEMORIAL, ROME.

At the present time an exhibition is being held in Rome of the designs submitted in competition for a memorial to the late King Victor Emanuel. These designs consist of models, geometrical and perspective drawings, and written descriptions, the models bearing a large proportion to the rest of the exhibits. Of the general character of the models it is difficult to write in any serious critical manner, the bulk of them being of so extraordinary and *rococo* a style as to suggest rather a desire on the part of their authors to bring the late king and his achievements into contempt, than to commemorate those actions in which he played so important a part, and which resulted in a unified Italy. As a rule, the drawings show designs very superior to those of the models, and we can claim fairly in this competition that the architects have surpassed the sculptors in the appropriateness of their suggestions and the vigour and originality of their ideas. As the selected design, if any be chosen, is to be carried out in Rome, English architects and archaeologists will naturally feel most interested in those schemes which suggest any alteration of existing buildings or interference with the ancient remains, and we will therefore first notice these. A large number of these schemes show some adaptation of the great semicircular wall in the Piazza delle Terme, which formed the *cavea* of a theatre in the Baths of Diocletian. This has been already cut through in the centre by the great new street of Rome, the Via Nazionale, and as the remainder is doomed to destruction we may welcome any idea which lends itself to preservation of it, whilst at the same time hiding its gaudy arches and rough brickwork by some suitable design. Accordingly several architects have seized this idea, and have suggested the formation of a covered colonnade round the walls, with a connecting triumphal arch spanning the street in the middle, surmounted with a statue of the king, or groups of other figures. In one or two cases it is proposed that the colonnade shall extend also on the flat side, and mask the bare walls of the Church of S. Maria degli Angeli. With these designs there is but little fault to find, as they propose to provide a shaded walk where one is so much needed, preserve a venerable ruin which would otherwise be destroyed, and erect a building of a distinctly monumental character.

With the other schemes which imply an alteration of the present buildings it is, however, impossible to agree. One (No. 194) proposes to widen the Corso for its whole length on both sides, destroying the façades of all the palaces and churches thereto, and then to extend its length across the front of the Palazzo Venezia, skirting the Forum of Trajan to the foot of the Capitol. Here the author proposes to erect a huge building, consisting of fountain, terraces, and arcades, so as effectively to build out the view of the Capitol and Ara Coeli from his new street. Another, and even bolder scheme (No. 257), proposes to continue the new Via Nazionale, where on a level with the lower part of the Quirinal, across Trajan's Forum, on a huge arch, thus almost patting back the hill which Trajan cut away, still farther dwarfing his column, and erecting on the Capitol at the end of this street a lofty building to mask the Church of Ara Coeli. A still more ambitious artist, having conceived a vast design without regard to any particular position, suggests two alternative positions on the map of Rome, one of which involves the diversion of the Tiber across the Borgo and the land on which stands Hadrian's Mole, so that on the reclaimed river's bed by the side of the Ripetta he may find a site sufficiently worthy of his design. Scarcely less satisfactory is the scheme (No. 33) proposed by another architect, who suggests the restoration of the Pantheon and the construction around it of an open colonnade, placed without regard to the recent discoveries made in the rear of the building.

The remainder of the designs, and the most numerous, are unconnected with the old buildings of the city, and may be divided between columns, triumphal arches, and groups of statuary on or around pedestals. Of the columns, it might be thought that they could not present much variety of design, but they nevertheless show many new ideas,—scarcely, however, to be commended. The author of No. 79, who proposes to erect an equestrian statue in the Piazza di Termini, puts two

Corinthian columns together, with a complete entablature thereon to carry the horse, while the designer of No. 119 shows, by a large model, a column of the external proportions of Trajan's, but of very different design. There is but little variation in the cap and base, but the shaft has an external spiral staircase, inclosed by glass, to give a view of the relief sculpture which winds round a thin shaft in the centre. But, of all the columns, the worst is that exhibited under No. 221, and said to be intended as a practical joke. In this the shaft is covered with an innumerable mass of nude women in every conceivable attitude, and in high relief, suggesting the author's desire to commemorate rather the weaknesses than the valour of the late king. The triumphal arches are generally poor in design, and either mounted on steps so as to preclude the idea of driving through them, or containing a statue of the king, so as to reduce them to being merely a canopy. They are also generally faced with columns in imitation of the arches remaining in the city. There are, however, a few designs to be exempted from this category, one of which, modelled by the Messrs. Filippo (No. 56), is a fourway arch covering an equestrian statue of the king. A deep frieze over the arches and bands across the piers are in bronze, well designed, in high relief, and there is no attempt to introduce columns. A full-sized model, beautifully designed, of portions of the natural foliage to be used, accompanies the design. A series of seven drawings, charmingly executed in the style generally taught in the École des Beaux-Arts, shows an entirely novel arrangement. The site proposed is the new square to be laid out on the Esquiline, containing the building known as the *Trophies of Marne* and other fragments of ancient works.

The scheme shows a vast half-circle, pierced in its basement by an arch crossing the central road, and bearing above an open colonnade, surmounted again by bronze statues and decorations. The foreground is occupied by fountains and steps leading to the terraces above. The design might be compared to the *Ramshells* at Munich, but raised to twice its height and made circular. Of the equestrian statues there are numerous imitations of Rauch's statue in the *Unter den Linden*, but in the groups there has been no lack of originality. In one of these is shown an equestrian statue surmounting an almost interminable flight of steps over which are scattered female figures in groups representing the various cities of Italy. In another is shown a storied pedestal of uncertain shape, at the base of which, amidst heaps of classic ruin, lie sheltered *Romulus* and *Remus* and the wolf. Rising spirally the various periods of Italy's history are shown by appropriate groups of figures and architectural detail, and at the top stands Victor Emanuel, whilst at the side, far below his level, although exalted on an independent column, is a figure of *Pace* trying to hand up to him, but vainly, the usual wreath.

There still remain two designs which scarcely come under either of the categories before mentioned. These are both for bridges across the Tiber, and if the internal evidence may be relied on, both by English architects. Both have supplied appropriate classic designs, although one of them is thought to be well known by his successful adaptation of Gothic architecture to Eastern climes. Both of these designs are boldly drawn in pen and ink, and if it were fair to speak of the accessories of a competition drawing, we should especially praise the bold and clever way in which the figures are put in in the foreground of the design No. 164. This design shows a suspension-bridge carried on two piers, with *Christians* columns attached, whilst the other, No. 36, is an arched bridge, with an open colonnade over, and piers enriched with relief carving and statues.

The examination of the whole series of designs, which number about 300, suggests the belief that, either for political or other reasons, the chief architects and sculptors of the country have held aloof from the competition, or that architectural art has fallen to an almost hopeless level in Italy.

Rome.

\* \* \* Since the above was written the Royal Commission, under the presidency of Signor Despretis, charged to decide upon the merits of the different models which have been submitted for the monument to Victor Emanuel, have awarded the first prize of 50,000 lire to M. Henri Menot, formerly a student at the French Academy. The design by Signor Ferrari Tacentini secured the second prize of 30,000 lire.

### ARCHITECTURAL EDUCATION AT HOME AND ABROAD.

#### ARCHITECTURAL ASSOCIATION.

At the ordinary fortnightly meeting of this Association on the 31st ult., Mr. Aston Webb, president, in the chair,

Mr. Cole A. Adams, one of the trustees of the Association Travelling Studentship Fund, announced that the Committee of the Architectural Association Sketch-book had made a gift of 100l. to the Studentship Fund, and he moved a vote of thanks to the Sketch-book Committee for the handsome donation, and to Mr. C. G. Maylard for the trouble taken by him in the matter. Mr. Kemp seconded the motion, but, while quite appreciating the motives of the Sketch-book Committee, thought that any future surplus might more profitably be spent on the improvement of the Sketch-book, especially in an increased use of photolithography, so as to save the time and trouble of contributors of sketches.

Owing to some misconception as to date, the paper announced for the evening was not forthcoming. In this emergency,

Mr. Gilbert E. Redgrave, Secretary to the Royal Commission on Technical Education, opened a discussion on architectural and technical education at home and abroad. He observed that during the past year he had seen very much of many of the technical institutions of this country and abroad. There was, in regard to architectural education, a great deal of difference between the English system of pupillage or articles and the Continental method of teaching professional work in colleges. One great and important feature of Continental schools was their training of the senses or perceptions of children at a very early age by what was known as the *Kindergarten* system, and the value of that system of teaching had been recognised and was being largely adopted by the Board and other elementary schools of this country. In France and Germany the lads in many of the schools were taught the elements of certain trades, such as, for instance, as carpentry, and it was gratifying, he thought, to find that a move in the same direction was being made in some of our English public schools by the establishment of workshops where the lads could learn how work should be done. In many French schools not only were the pupils taught the theory of construction, but they were taught to apply rules and formulas practically in such work as the framing of trusses, &c. This plan of combining practical instruction with scientific teaching had many advantages as compared with the English system, where young lads who had just entered architects' offices without any sort of preparation (except, perhaps, that they had a taste for drawing) had few opportunities of going on works and seeing work in actual execution. We had, however, the beginnings of at least two schools (those in connexion with King's and University Colleges, London) calculated to some extent to supply the deficiencies of the pupillage system with regard to scientific knowledge, but we certainly had nothing like the *École d'Architecture* at Paris,—a school, as its name implied, especially for the education of architects, and carried on under the direction of professors. These professors, however, did not employ the pupils in the erection of works, but set them to make designs for buildings which were never carried out, and never intended to be carried out. This was certainly a great defect in the French system. One point which was worthy of consideration by the Association in connexion with the subject was as to how far it would be possible to add to the classes which the Association had already established practical classes for actual experiment in construction and with materials? Would it not be possible for the Association to affiliate some of its classes with such classes as those at King's or University College? The result of some such arrangement would, he believed, be very beneficial, for it would supply a great need. On the whole, he was prepared to maintain that the training which the young architect received in England in the course of his "articles" was not sufficiently practical, either as to the materials with which he had to deal, or as to the best method of putting them together.

The Chairman, in inviting discussion on Mr. Redgrave's observations, said that one important point for consideration was the extent to which it was advisable that a lad, before leaving



school, should pursue a line of study intended to prepare him for the profession which he was to follow. His opinion was that it was not advisable to give any special direction to school studies. Of course, it was necessary that a lad intended to be an architect should have a good education, the possession of which would enable him to master the details of his professional work when brought to face with them. He was not inclined to put much trust in the Continental method of teaching construction to schoolboys, for such teaching must of necessity be confined within very narrow limits. The relative advantages and disadvantages of the English system of architectural pupillage, as compared with the French system, had often been discussed. Several very distinguished members of the Association had passed through the French school, with very great distinction and advantage to themselves, but he could not help thinking that their success was largely due to the fact that they had combined with the French system the practical training to be obtained in England. He did not claim that the English system was perfection, or anything like it; indeed, the Association was avowedly established and carried on to remedy the educational defects of, and to supplement the teaching capable of being afforded by, the pupillage system. He believed that there was a large future before the Association, which he trusted would some day become the nucleus of a sort of architectural college, which should gather under one roof all the educational facilities now open to the young architect, whose opportunities for study and improvement, although numerous, were scattered and necessarily devoid of system.

Mr. Stannus pointed out that the great evil of the French *atelier* system of architectural education, as pursued at the Ecole des Beaux Arts, was that it was not practical. The students were set to make designs for various buildings, each of which was almost invariably described in the instructions as intended "pour une riche amateur." Such being a usual condition, there were no incentives to studying the economies of plan and construction such as were held out by the necessity of constructing a school at a certain moderate fixed sum per acre. In France the first portion of the young architect's education consisted of Design, and the second portion of Construction, the use of materials, &c. Surely the two branches of study should be taken concurrently? That they were not, was undoubtedly the cause of the great want of practical knowledge shown by most young architects in France. They were, it was true, experts in making beautiful drawings. They were wonderfully clever in working-up Indian-ink washes, and they projected their shadows with mathematical precision. Very often, however, as the chairman had said, the walls depicted on a plan were made of uniform thickness in order to "balance" the drawing, and without any reference whatever to the construction; while it was quite a common thing to find that sections, instead of exhibiting such practical and useful information as the method of constructing the roof, showed instead beautiful washes of carmine. Seeing that the design of a building was so greatly dependent on its construction, and that its construction was so much dependent on its plan, it was manifest that the French school was not a good one for an architect to be brought up in. The practical defects of the French *atelier* system were, however, not necessarily inherent to the system of technical instruction advocated by Mr. Redgrave. It was unquestionable that the very *raison d'être* of the Association was the existence of admitted defects in the pupillage system. He sincerely trusted that some day the chairman's idea of an architectural college (which should bring together and combine the various scattered agencies of architectural education now existing) would be realised. In conclusion, Mr. Stannus referred to the very high excellence of French draughtsmanship, particularly instancing the drawings sent home by the holders of the *Grand Prix de Rome*. The great mistake made by young French architects, however, was in regarding draughtsmanship as an end in itself, instead of assigning to it its true function as merely a means to an end.

Mr. Hampden Pratt said that no doubt it was very desirable that the young architect should have opportunities for making himself thoroughly conversant with the practical work of construction; but, setting aside the idea of the proposed college, it was very difficult to satisfy that desire.

Instances had been mentioned in which architects had themselves worked at the carpenter's bench or the mason's banker, but anything like the general adoption of the practice would be attended by many difficulties, some of which, he was afraid, would be insurmountable. Of course, in the workshops of a professional and technical college such as had been proposed, the students might very well learn the use of tools, but the instruction to be gleaned in that way would not have the same amount of practical value as that to be gained in the workshops of a first-class builder or during the progress of the erection of a building. On the whole, he did not think that there was so much to be said in favour of the establishment of such a college as had been proposed as might at first sight appear. One drawback to be anticipated from the establishment of such an institution was that it would hardly be possible to have different styles of design taught in it with thorough impartiality, the tendency naturally being towards an academic style.

Mr. J. P. Seddon said that in his opinion there was great need for architects receiving a more thoroughly practical training than many of them now received. It was his experience that even among surveyors, who were generally regarded as being very much more "technical" than architects, there was often a lack of that intimate knowledge of practical work which it was so necessary to possess in order to be able to superintend the erection of a building. He agreed with Mr. Pratt in doubting whether such a college as had been suggested would be successful in doing the work anticipated from it. It would tend in the direction of the foreign system, which had not been altogether successful, judging by results. He did not think that it would be advisable for a young lad who wished to become an architect to enter a technical school before entering an architect's office, but after he had been a year or two in an architect's office he would be able to obtain the fullest advantages from such a school, as he would then have some idea of the direction which his studies should take. After all, the different branches of an architect's work were comparatively few.

Mr. Martin thought that a lad who was destined to enter the architectural profession might usefully have his school-work so arranged as to more readily fit him for entering upon the profession than was usually the case. He should like to see the establishment of such a college as had been spoken of, and he should also like to see architects form one brotherhood, having community of interests, so that the architect of inexperience and small practice might be allowed the privilege of freely inspecting and watching the progress of works being carried out by his more experienced and eminent brethren.

Mr. Trubshaw, after expressing his regret that the millennium desiderated by the last speaker had not quite arrived, spoke of the great advantage which was to be derived from engaging in the practical work of a builder's shop.

The discussion was continued by Mr. Booth, Mr. Burrell, Mr. Mountford (who spoke commendably of the practice, wherever it was possible, of appointing young architectural assistants as under-clerks of works, subject, of course, to a senior and experienced clerk of works), and Mr. Hunter, and a vote of thanks having been passed to Mr. Redgrave for initiating the discussion, that gentleman briefly referred to some of the points raised, and the meeting terminated.

**The Gardens of Chelsea Hospital.**—At a recent meeting of the Chelsea Vestry, letters were read from Sir C. Dilke, M.P., and the Right Hon. W. H. Smith, M.P., respecting the proposed abolition of Chelsea Hospital and the pleasure-grounds attached thereto. Sir C. Dilke wrote:—"I am not aware that any scheme is contemplated which will deprive the public of the use of the grounds of Chelsea Hospital. I trust that my opinions on the subject of open spaces for the people are so well known to my own constituents that they can have no apprehension that I shall cease to watch their interests in a matter like this." Mr. Coope, M.P., and Sir J. McGarel-Hogg, M.P., also wrote, promising that they would carefully watch any proposal to restrict the advantages enjoyed by the public in respect of the hospital grounds.

## THE HALF-YEARLY MEETINGS OF THE RAILWAY COMPANIES.

### COSTLY EXTENSIONS.

THE proceedings at the half-yearly meetings of the several railway companies, which have just been brought to a close, reveal the fact that, as regards many of the great companies having their termini in the metropolis, extensions of exceptionally gigantic magnitude are about to be carried out, the enormous and continually increasing traffic rendering the intended new works altogether unavoidable. These necessary and costly extensions apply more especially to the Great Eastern, Great Northern, London and Brighton, and Midland Companies, all of whom are about to incur a very heavy expenditure in enlarging their station and other accommodation within the metropolitan area. A satisfactory feature in almost all the reports is a very considerable increase in the traffic receipts as compared with the corresponding period of last year.

The Great Eastern is amongst the companies which are about to incur the heavy expenditure referred to. The report presented to the shareholders stated that during the half-year there had been an increase of revenue at the rate of 5½ per cent., representing a net gain, as compared with the corresponding period last year, of 44,000*l.* The traffic receipts for the half-year amounted to 1,704,024*l.* The dividend recommended was at the rate of 3½ per cent., which is the largest dividend the company has yet paid. The report added that the outlay during the half-year on new lines and other works had been 821,000*l.*, and that the further estimated capital expenditure was 1,620,000*l.*, of which 612,000*l.* would be required during the current half-year. In addressing the shareholders, the Chairman pointed out the absolute necessity there was for enlarging the Liverpool-street Station, and also for laying down additional lines as far as Stratford. The cost of the Liverpool-street Station would appear to have been something fabulous, the Chairman stating that the land alone cost the company 100,000*l.* an acre, and as it covers an area of ten acres, the total cost of the land was 1,000,000*l.* sterling. He observed that large as the station was, it had not met the entire necessities of the traffic. The number of trains had increased by 50 per cent. within the last few years; and they had also to accommodate 140 trains a day of the East London Company. The consequence was that the directors felt that the time had arrived when they must make additions to the station, and lay down further lines into it. In continuation, he explained how they would shortly have six lines laid down, but, he added that the station itself was fast becoming inadequate to the traffic, and this had led the directors to avail themselves of the powers which they possessed for purchasing property in Bishopsgate-street, from time to time, as they could obtain it. Referring to the fish and vegetable market which the company were forming under the new goods depot at Shoreditch, he observed that if the Corporation opposed them on the ground of their alleged exclusive rights they would be prepared to fight them in a court of law. The four acres and a half of the market would be ready for opening in June next.

The Great Northern Company's report stated that the traffic receipts for the half-year amounted to 1,779,228*l.*, as compared with 1,664,193*l.* in the corresponding period of 1880. The increase applied to both passenger, merchandise, and mineral traffic. A special feature in the report was the statement as to the different classes of passengers. Whilst there had been a considerable decrease in first-class passengers, the second-class passengers had increased by 13,000, and the increase in the number of those travelling third-class had been no less than 407,803. During the half-year the sum of 643,544*l.* had been expended on capital account, and it was estimated that a further sum of 1,876,844*l.* would be required for new works, of which 662,500*l.* must be expended during the current half-year. The dividend recommended was at the rate of 6½ per cent. Speaking of the extension works which the directors felt compelled to carry out, Lord Colville, the chairman, observed that there was no finality in respect to railway capital. The population of the country was increasing at an enormous rate, and they were bound to find accommodation for it.

The report and accounts presented at the meeting of the London and Brighton share-



holders showed that the receipts during the half-year amounted to 1,154,878l., being an increase of 50,866l., as compared with the previous corresponding half-year. The dividend recommended was at the rate of 8½ per cent. The capital expenditure during the half-year had been 357,934l., and further capital amounting to 1,250,000l., was required. Of this sum 355,000l. would be absorbed in the Tanbridge Wells and Eastbourne line, the Ryde Pier and railway, and the Gloucester and Midhurst, Lewes and East Grinstead, and the Woodside and Croydon lines. The Chairman, in moving the adoption of the report, said that their traffic was increasing at the rate of 70,000l. a year, and it was not possible to provide out of ordinary revenue for the enlargements and extensions on the line which were constantly being required. The improvements at the stations and extensions at various points on the line were absolutely necessary, if the traffic which was constantly expanding was to be provided for. The New-haven works were proceeding satisfactorily, the breakwater being considerably advanced towards completion, but an additional sum of 50,000l. would be required to finish it.

The Midland Company's report stated that there had been a considerable increase in the revenue during the half-year, over the corresponding period of 1880, the traffic receipts amounting to 3,626,970l. The third-class passengers had greatly increased in number, whilst in the first-class there had been a considerable decrease. The dividend declared was at the rate of 6½ per cent. The total capital expenditure during the half-year on lines open for traffic, and on new lines, was 786,028l. During the current half-year 1,000,000l. more would have to be expended, and the estimated expenditure in subsequent half-years was 2,962,556l. Adverting to the Poplar Dock branch and depot, the report stated that the river and dock walls were completed, and the water had for some time past been admitted into the dock. The large warehouse was roofed in, and the small one was ready for the roof. They had the traffic to carry on, and in order that they might do it the shareholders must be good enough to let them have the capital which was necessary for it, or otherwise they must allow the traffic which the Midland Company was more adapted to carry than any other Company to go by some other line that would make provision for it.

The traffic receipts of the London and North-Western Company for the half-year amount to 5,253,511l., showing a considerable increase over those of the corresponding period of last year, and the dividend recommended in the report was at the rate of 8 per cent. The report stated that 1,198,199l. had been spent on capital account during the half-year, 965,971l. of which was on account of the Roads, Northampton, and Rugby line, which was opened in December last. The chairman's remarks in addressing the shareholders were to a great extent directed to a review of the manner in which the property and lines of the company had been maintained, and also to an examination of the different classes of passengers which had been carried during the half-year. At the outset of his observations he made the statement that whereas thirty years ago the capital of the company was 27 millions, it was now 100 millions. It was one thing to play with small stock, but when they had a property of 103 millions it required the greatest amount of care to guard against even the approach to depreciation.

The report submitted at the meeting of the Great Western Company stated that the traffic receipts for the half-year amounted to 3,994,843l., being 184,000l. in excess of the receipts in the corresponding half-year of 1880. The increase was both on passenger, merchandise, and mineral traffic, the greatest rate of increase being on merchandise, and amounting to 99,000l. The dividend recommended was at the rate of 7½ per cent. The expenditure on capital account during the half-year had been 481,975l. The further estimated expenditure of capital on new lines and other works was 2,020,880l., of which 368,989l. would be required during the current half-year. It was stated that the heading of the Severn Tunnel had been completed during the half-year, so that there were now the means of passage from shore to shore beneath the river. The whole of the arching for a considerable length of the permanent tunnel had been completed through the only portion of the work in which the more serious difficulties were felt to exist. In consequence of the enormous

increase of traffic, the line between Slough and Taplow had been doubled.

The traffic receipts of the London and South-Western Company for the half-year amounted to 1,461,879l., being 41,000l. in excess of the corresponding period in 1880. The dividend for the half-year was at the rate of 7 per cent. Amongst the new works which the company are about to carry out is the widening of the line from Clapham Junction to Hampton Court Junction, and also to Barnes. A new line in the neighbourhood of Southampton is also to be constructed, at a cost of 450,000l., which will shorten the distance between London and Southampton. The projected City extension from Waterloo was one of the subjects of discussion at the meeting, several shareholders speaking strongly in favour of it, and the chairman observing that the project was one of the largest questions that had ever been brought before the shareholders. The carrying out of the undertaking would probably involve the expenditure of 3,500,000l.

The traffic receipts of the South-Eastern Company for the half-year amounted to 1,760,000l., showing an increase of 39,300l. as compared with the corresponding period of 1880. The dividend was at the rate of 8 per cent. The expenditure on capital account during the half-year had been 641,500l. The report stated that the estimated capital expenditure in the future was set down at 1,556,000l. In the course of the discussion at the meeting, the chairman, Sir Edward Watkin, stated that although the Charing-cross and Cannon-street and London Bridge line had cost 3,000,000l., it did not afford sufficient accommodation for the traffic, and it was therefore proposed to widen it. A portion of the necessary land had already been purchased.

At the meeting of the London, Chatham, and Dover Company, it was stated that the estimated cost of the new City station in Thames-street was 400,000l. Like most of the other lines, the traffic receipts for the half-year were in excess of those of 1880.

The reports of the North-Eastern Company, North Staffordshire, Metropolitan, Metropolitan District, North London, London, Tilbury, and Southend, Manchester, Sheffield, and Lincolnshire, Caledonian, North British, and Lancashire and Yorkshire, all showed a large increase of traffic as compared with last year. The last-named company are about to incur a large outlay in new works at Liverpool, Fleetwood, Bury, Bolton, and other places in Lancashire.

#### FROM EDINBURGH.

OUR province does not extend to matters ecclesiastical, except in so far as they refer to matters architectural. Those who are urging on a war of extermination against the Established churches of England and Scotland have concentrated their fire upon the latter as being, in their opinion, the most likely to succumb; but, in spite of their efforts, and probably on account of the manner in which the attack is conducted, their efforts appear to have a contrary effect to what they aim at, and the Kirk exhibits greater energy than ever, and is extending its borders in all directions. We have had occasion lately to refer, from time to time, to numerous new churches in connexion with the Church of Scotland which have been erected in and about Edinburgh. Some years ago a large new church was erected at Kilgraston-road, in the parish of Mornington, notwithstanding the protests of the Kirk Session, who maintained that the new church was unnecessary, and would prove detrimental to the parish church; but as the matter now stands both churches are filled to overflowing; another large church has been erected in the neighbourhood at Merchiston; and there are upwards of 100 applicants for sittings in the parish church, whose requests cannot be complied with. To meet this demand it has been proposed to extend the church so that it may afford 200 additional sittings, and three sketch designs have been submitted by Mr. Campbell Douglas, of Glasgow, Mr. H. J. Blanc, and Messrs. Hay & Henderson, of Edinburgh, respectively. The suggestions of Messrs. Hay & Henderson have, we understand, met with the most favourable reception, but it is under consideration whether it would not be expedient to erect an entirely new church, especially as the existing one is defective as regards acoustics. The church as it stands is a specimen of the nondescript Norman style, with elongated windows, which flourished fifty years

ago; and subsequent additions, in the form of transepts, are in the same style. The site it occupies is a good one, and affords scope for architectural display. The suggestions of Messrs. Hay & Henderson, we understand, embrace the entire removal of the present west front, including the central spire, and its extension westward with a tower at one angle and spire at the other.

A movement is on foot for the establishment of a private atelier in Edinburgh to enable artists and students who have passed through the curriculum of the Royal Scottish Academy's Life School to continue and supplement their studies. It is contended "that such a scheme, if established with a view to provide permanent supplementary means of study from the life, would supply a long and widely-felt want, and prove of great and progressive benefit to the Scottish school of painting, placing it in respect of education more on a level with the great Continental schools." With a view of raising the necessary funds for carrying out the proposal, the Scottish artists have been invited to contribute examples of their work, by the sale of which funds might be raised for furnishing suitable premises, and a committee has been formed to whom is entrusted the carrying out of the scheme.

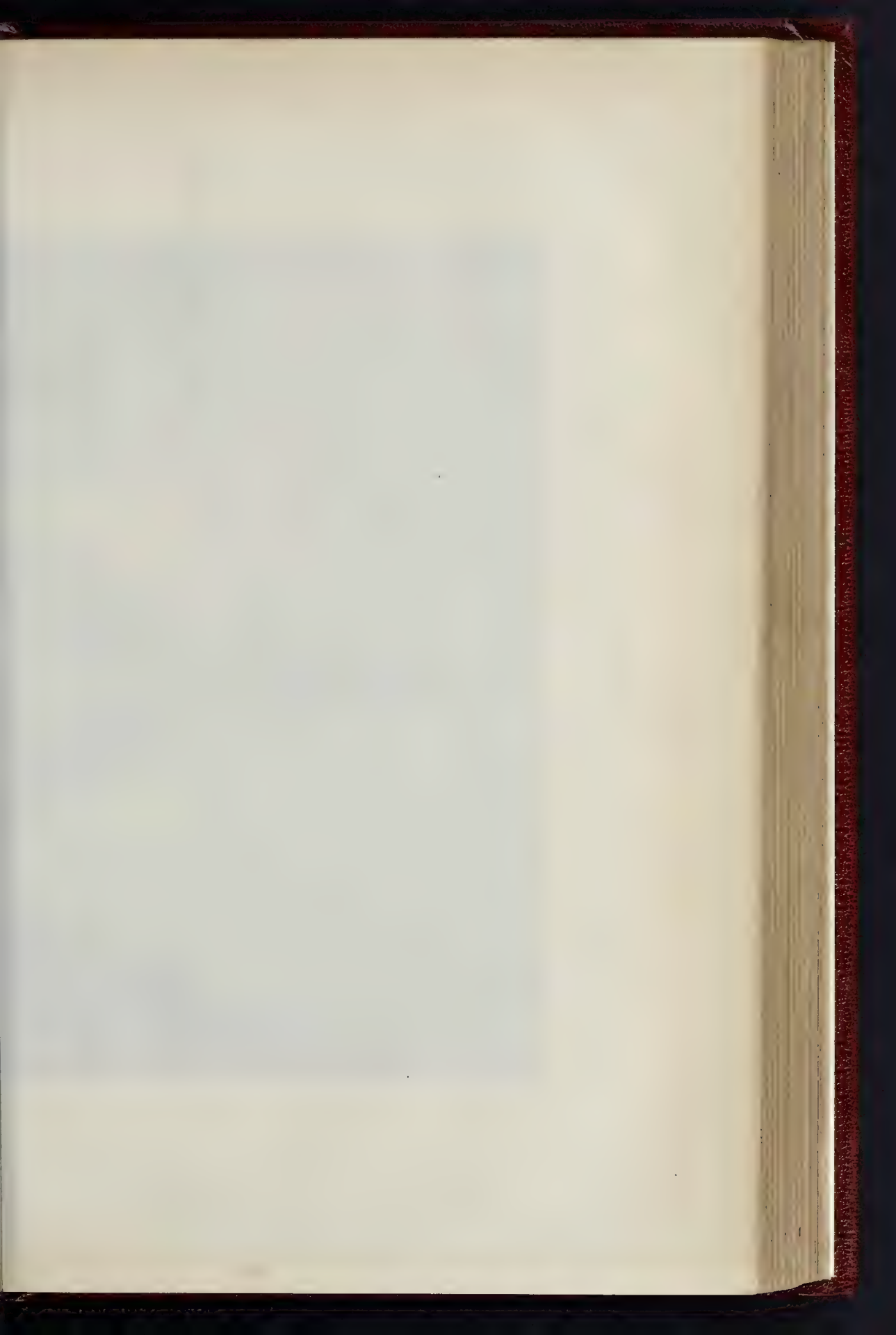
Another art movement has been broached, having for its object the reproduction in bronze of a group of "Alexander and Bucephalus," an early work by Sir John Steel. This work is highly spoken of, and was considered by the late Sir William Allan, P.R.S.A., to possess remarkable merit. It was exhibited in the Royal Institution, and an award of 50l. was voted to the young artist by the Board of Trustees for Manufactures. As showing the estimation in which it was held by the younger artists of the day, it may be mentioned that studies in oil were made of it by the late Sir Daniel McNae, while Dyce and David Scott executed careful drawings of it. The incident represented is the taming by the youthful Prince of Macedonia of the redoubtable charger whose indomitable spirit had previously resisted all restraint. The horse is shown in the act of rearing, the hind-legs finely poised and the fore-feet thrown freely into the air. The hero stands on the near side, with his right limb advanced, and with his right hand he draws back with muscular action the fiery steed, while with his left-hand he is patting its shoulder. By the energetic movement his robe is thrown off the right shoulder and falls in voluminous folds over his left side. The head is modelled from a bust in Florence. It is proposed to place the group in St. Andrew's-square, facing George-street, and where it would be seen in profile from North and South St. David's-street.

Professor Blackie has inaugurated a paper war, by attacking Mr. Anderson's new campaign at Free St. George's Church. This church, designed by the late Mr. David Bryce, is of that late variety of the Renaissance marked by broken pediments, and having the alternate voussiors of the arched openings projecting from the wall surface. It is far from being a happy production, and Mr. Anderson has boldly treated it with contempt, and designed a tower not quite in keeping with it, his object having evidently been to produce a good distant effect, rather than to secure harmony of parts when closely observed. In execution this object has been fairly secured, but the procedure is objected to by the Professor *ab initio*; but he has not had all his own way, for artists and men of taste have arisen in defence of the design. This, we think, is a healthy sign, architectural works being too often passed over with indifference.

We have never seen so much home property in the market as at present. The open winter and low rate of wages have induced over-building. Prices have fallen 30 per cent. within the last three months, and several failures are announced.

**The Austrian International Exhibition of Paintings.**—On the 1st inst. His Majesty opened the International Exhibition of Paintings in the Künstlerhaus, the original building, built by subscription, and which is used for monthly exhibitions, being too small for an international exhibition, even on the most modest scale. In March last year a movement was started to complete the building, and again the necessary funds were found, the Emperor leading the subscription. The French and German sections occupy the largest space in the new part of the building, most of their chief painters being represented. At the side of them are the Belgian and Spanish contributions.

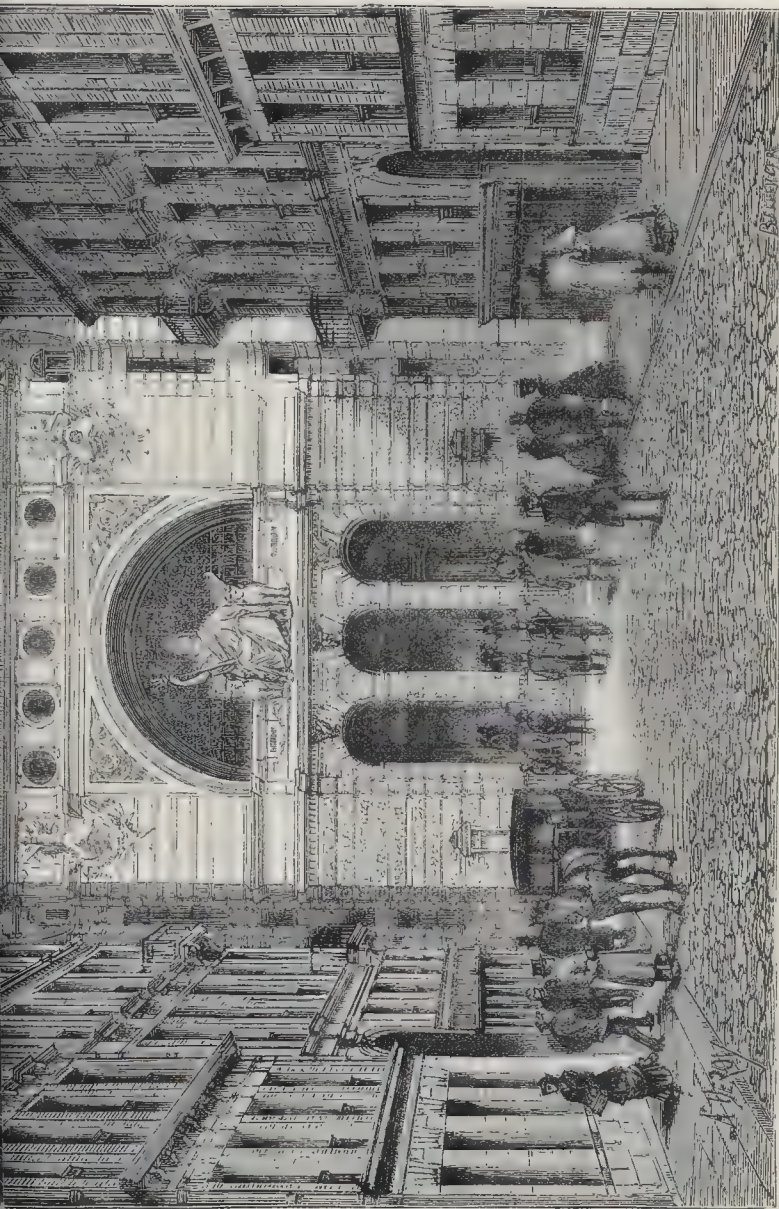




THE BUILDER, APRIL 8, 1892.



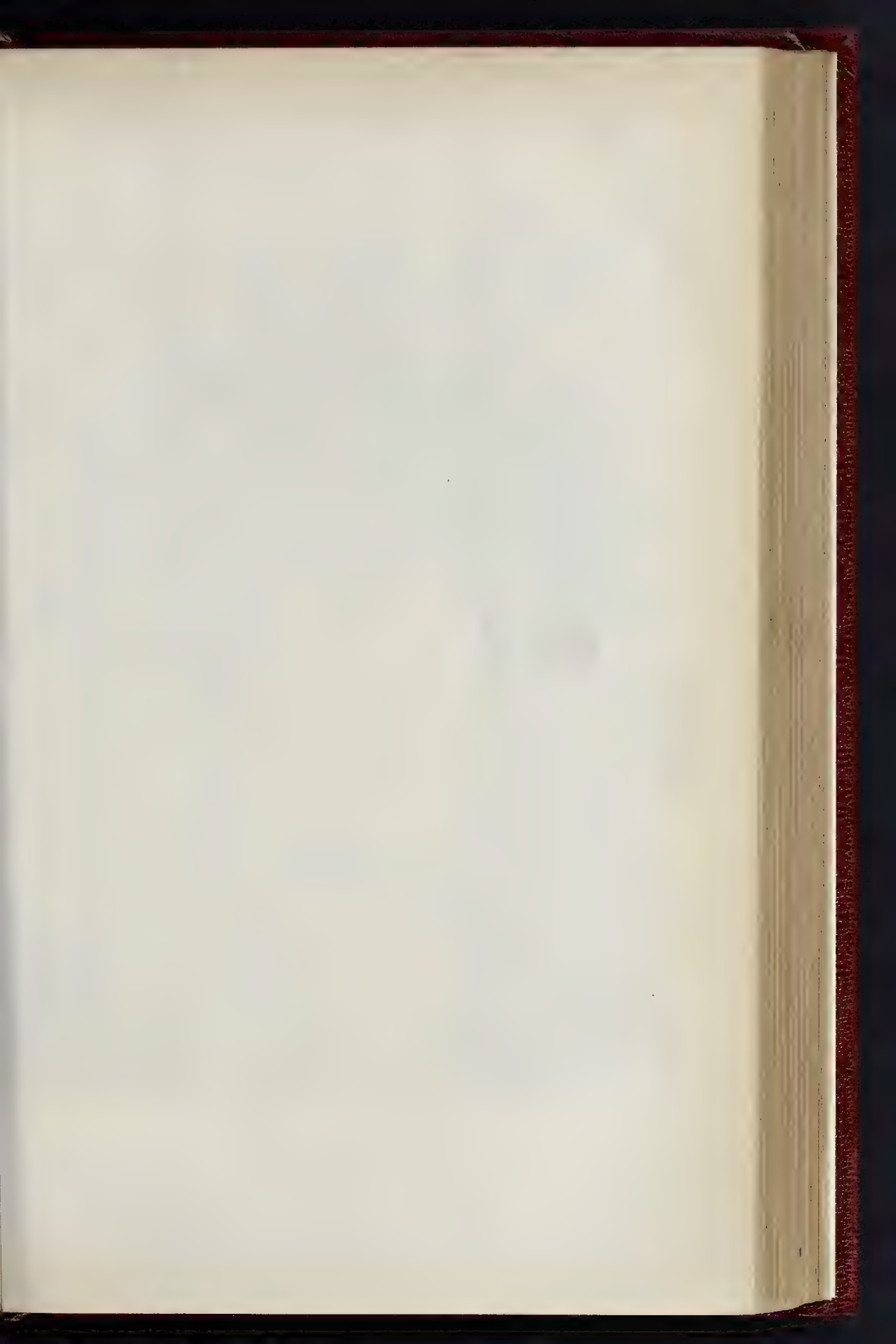




THE NEW BUILDINGS OF THE "COMPTOIR D'ESCOMPTE DE PARIS."—M. LORHOYER, ARCHITECT.



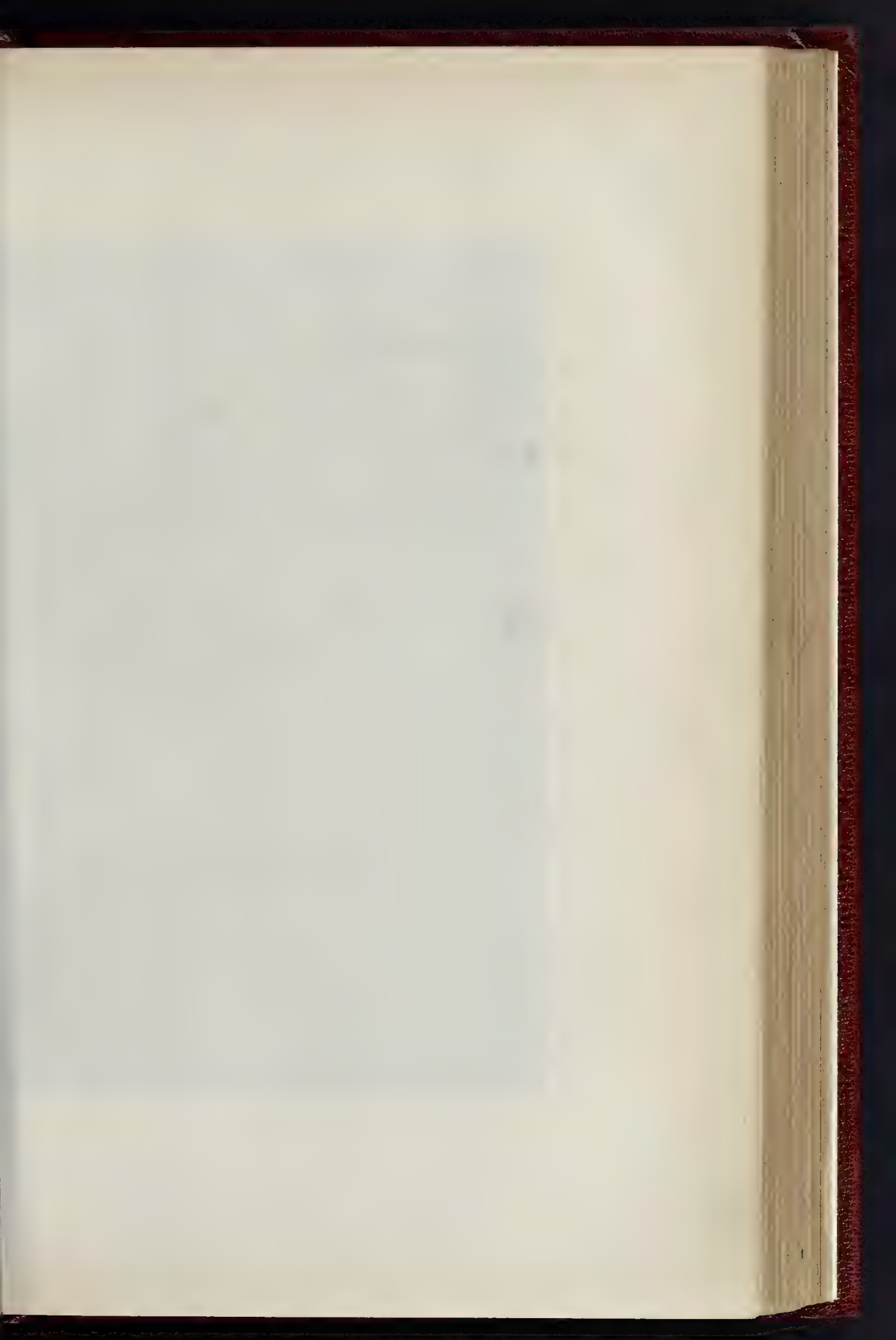


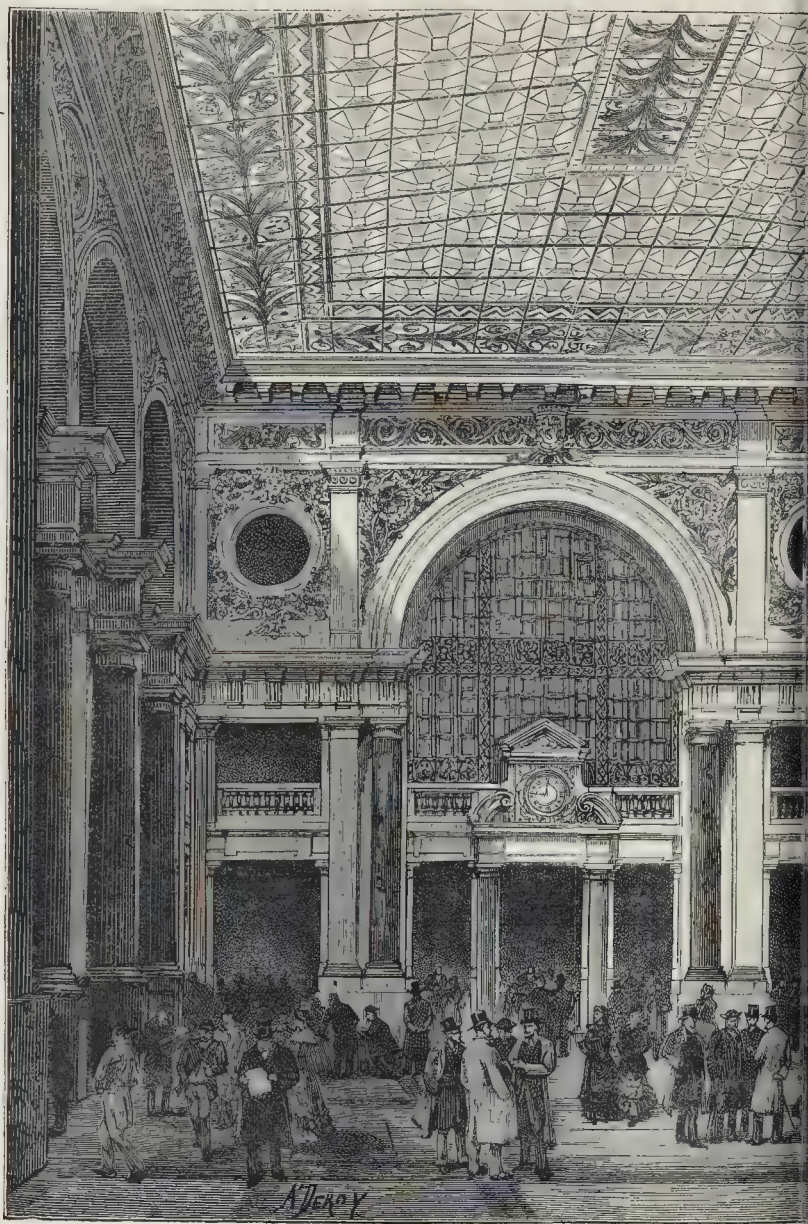




NORMAN DOORWAY, DURHAM.







THE GREAT HALL OF THE "COMPTOIR"

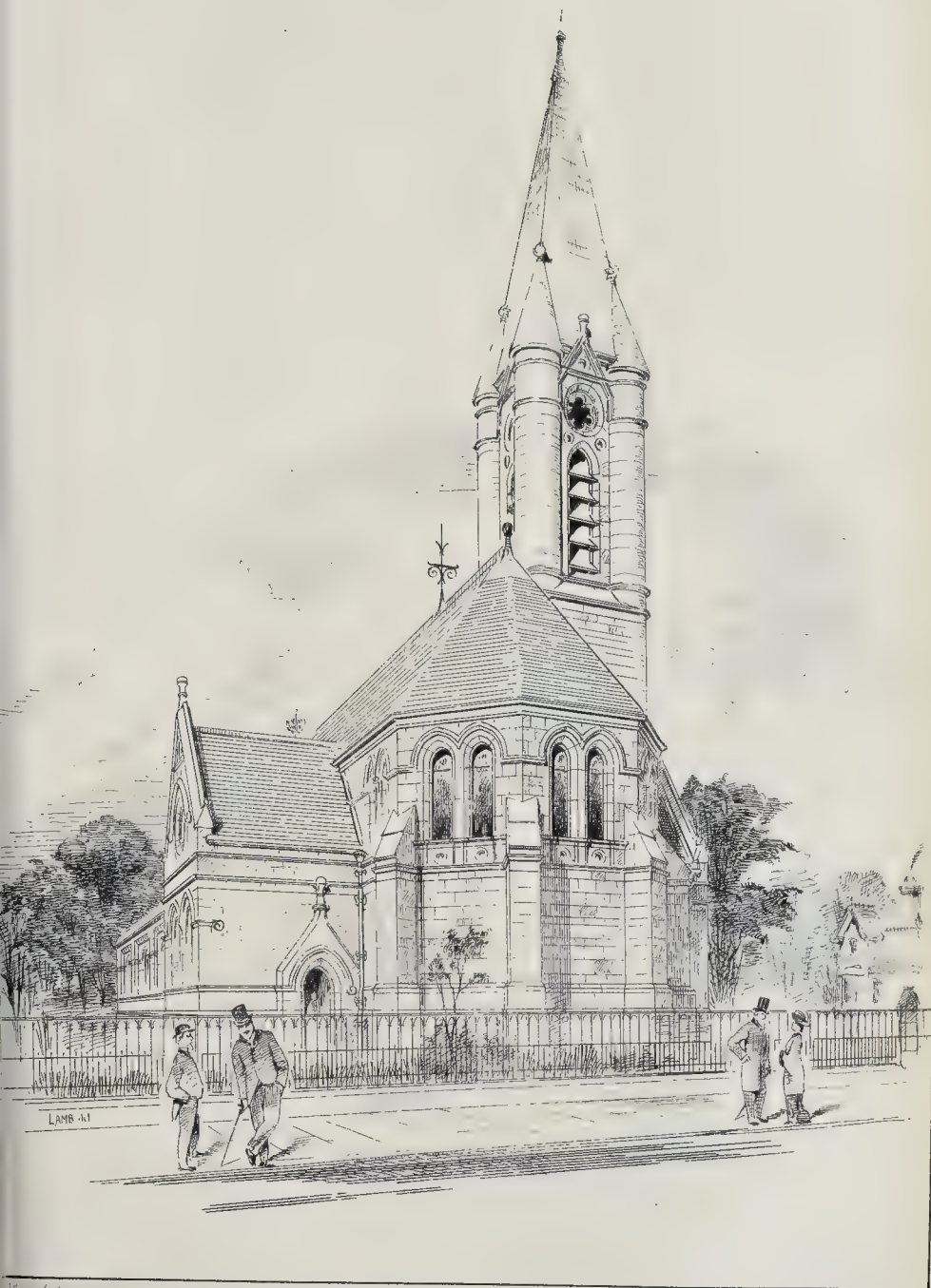




PARIS.—M. CORROYER, ARCHITECT.







PROPOSED NEW CHURCH, SCARBOROUGH.—MR. THOS. MILLER, ARCHITECT.





### THE NEW BUILDINGS FOR THE "COMPTOIR D'ESCOMPTE DE PARIS."

AMONGST the most important and successful works in Paris is the new monumental structure scarcely yet completed, which has been erected for the well-known financial establishment, the "Comptoir d'Escompte de Paris," which dates from 1848, during the second French Republic, and has branches bearing the same title in London, India, China, Japan, America, and elsewhere. It maintains, we believe, a high reputation. The architect of the new building is M. Corroyer.

We give two views,—the Façade, as seen from the Boulevard Poissonnière, when looking towards the Rue Rougemont, and the Interior of the Great Hall.

A statue by Millet, of Prudence, calm and reflective, dominates the main entrance, an arcade of three openings leading to a handsome vestibule, from which the various departments of the establishment are easily reached. Externally, the architect has succeeded in producing a new and commanding form.

The great hall includes monolithic columns of granite, artistic bas-reliefs and mosaics, and a vast ceiling of glass, which, apparently so light and fragile, is in truth a formidable arrangement of iron and glass. Here the art of the architect is less obvious than the science of the engineer. But where the architect still remains master of the field is in the manner in which he has been able to dissimulate to the eye the considerable efforts he has been forced to make to suspend such a construction in the air. In the roof, above these iron bars, a series of electric lamps light up the hall at night with wonderful effect.

Monsieur Corroyer is the Government Architect charged with the restoration, or rather restitution, of Mont St. Michel, and has given many proofs of a solid erudition, intelligence, and ingenious talent. But it was to be feared, some thought, that his previous studies would have drawn him into a retrospective path, where our modern conceptions would find themselves out of place. Nothing of the sort, however, has occurred. Passing from Mont St. Michel to the Comptoir d'Escompte, M. Corroyer has at once thrown off the "old Adam," and has met the newer exigencies he has had to satisfy, and that without hesitation or embarrassment. In spite of the impudence and the follies of some of its adepts, Finance remains one of the reigning powers of our times.

### NORMAN DOORWAYS.

You have recently given several interesting specimens of Norman doorways, with evidently a practical intent. I send you, as an addition to that series, the accompanying sketch of one in the neighbourhood of Durham, which seems to me to be a good typical example of Norman work of the best period, when, without losing that vigour which characterises all work in this style, greater delicacy was displayed in the details, leading up to the graceful proportions of the Early English style.

G. H. M. A.

### PROPOSED NEW CHURCH, SCARBOROUGH.

THE church we illustrate, which is to be erected from the designs of Mr. Thomas Miller, architect, will accommodate 5000 adults. The building will be faced entirely with stone, and will have slated roofs. The interior facing is of red stock bricks with stone dressings, and with granite shafts supporting the main timbers. A marble redosol will be placed in the chancel. The choir-stalls will be of oak, carved. The oost (not including reredos and choir-stalls), will be about 7,000*l*. Tenders, we are told, will shortly be invited.

**Memorial of William Tyndale.**—The Committee for the erection of a monument on the Thames Embankment, in memory of William Tyndale, who first translated the New Testament into English, met last week in the large room of the British and Foreign Bible Society, when it was agreed that Mr. J. E. Boehm, A.R.A., should prepare and place the bronze statue, 10 ft. in height, on a suitable granite pedestal, on the site (west of Charing-cross) granted by the Metropolitan Board of Works. The expense will be 2,400*l*.

### THE LESSER ARTS OF LIFE.

THE fifth of the series of lectures given in support of the Society for the Protection of Ancient Buildings, was delivered on the 30th ult., at the Kensington Vestry-hall, by Mr. Wm. Morris, M.A., who took for his subject "The Lesser Arts of Life."

The lecturer said that, without pretending to give a definition, what he meant by an art was some creation of man which appealed to his emotions and his intellect by means of his senses. All the greater arts appealed directly to that intricate combination of intuitive perceptions, feelings, experience, and memory, which was called imagination. The race of man, even when very moderately civilised, had a great number of wants which had to be satisfied by the organised labour of the community. From father to son, from generation to generation, had grown up a body of almost mysterious skill, which had exercised itself in making the tools for carrying on the occupation of living, so that a very large part of the audience of the masters of the greater arts had been engaged, like them, in making things. Men whose hands were skilled in fashioning things could not help thinking the while, and soon found out that their dactyl fingers could express some part of the tangle of their thoughts. Thus, though they laboured, they did so somewhat for their pleasure. They had conquered the curse of toil, and were men. Here, then, were two kinds of art. One of them would exist, even if men had no needs but such as were essential; the other kind, called into existence by material needs, was bound no less to recognise the aspirations of the soul, and received the impress of its striving towards perfection. This being so, even the lesser arts were well worthy the attention of reasonable men, and those who despised them must do so either out of ignorance as to what they really were, or because they themselves were in some way or other enemies of civilisation, either outlaws from it or corruptors of it. There had been, in all ages of civilisation, men who had acted on some such principle as the following words represented:—"The world is full of grievous labour; the poor toiling for the rich and ever remaining poor. With this we, at least, will have nothing to do; we cannot amend it, but we will not be enriched by it, or be any better than the worst of our fellows." That might be called the monk's way of rejecting the arts. Who knew but what the field of art might have to lie fallow awhile that the weeds might be known for what they were, and be burnt in the end. If they were to be excused for rejecting the arts it must not be because they were contented to be less than men, but because they longed to be more than men. If there were no other way of resisting the oppressors of the people, whom they called "Philistines," there was the "citizens' way," viz., by abstaining from multiplying their material wants unnecessarily, and by doing their best to introduce the elements of hope and pleasure into all the labour with which they had anything to do, seeing that these things were the work of free men and not of slaves. It was clear that if they were to fulfil these duties they must take active interest in the arts of life which supplied men's material needs, and know something about them, and it was to help those present to a small fragment of this necessary knowledge that he now addressed them. Of those arts to which he would refer he knew something, either as a workman or as a very deeply interested onlooker. Not only was it possible to make the matters needful to their daily life works of art, but there was something wrong in the civilisation that did not do this. If their houses, clothes, household furniture and utensils were not works of art they were either wretched makeshifts or, what was worse, degrading shams of better things. If any of these made any claim to be considered works of art they must show obvious traces of the hand of man, guided directly by his brain without more interposition of machines than was absolutely necessary to the nature of the work done. Whatever art there was in any of these articles of daily use must be evolved in a natural and an unforced manner from the material that was dealt with, so that the result would be such as could not be got from any other material. Lastly, love of nature, in all its forms, must be the ruling spirit of such works of art; the brain that guided the hand must be healthy and hopeful, must be keenly alive to the surroundings of their own days, and must be only so much

affected by the art of past times, as it was natural for an art to be which was alive, growing, and looking towards the future.

First, he must mention architecture, which, though it ministered to their material needs, and, according to the division between purely spiritual and partly material arts, should be reckoned among the lesser arts, had, to judge by its etymology, not been reckoned so in times past. Speaking of the whole world, and at all times, it would not be quite correct to say that the other arts could not exist without it, because there had been, and were, large and important races of mankind who, strictly speaking, had no architecture, who were not house-dwellers but tent-dwellers, and who, nevertheless, were by no means barren of the arts. The very seriousness and depth of feeling which were brought to bear upon matters of daily life, were, in fact, the soul of architecture, so that amongst themselves the existence of the other arts was bound up with that of architecture. He claimed for the Society for the Protection of Ancient Buildings no less a position than this, that in calling upon its members to reverence examples of architecture, and to understand and protect the continuity of its history, it was guarding the very springs of all art and of all cultivation. But the arts he had to speak of in more detail were comparatively a small part of architecture, considered in that light. To begin with pottery, the most ancient and universal, as it was, perhaps (setting aside house-building), the most important of the lesser arts, and one, too, which had the consideration of recommending itself to them from a more or less historical point of view, because, owing to the indestructibility of its surface, it was one of the few domestic arts of which any specimens were left to them of the ancient and classical times. All nations, however barbarous, had made pottery, but none had ever failed to make it on true principles, and none had ever made shapes ugly or base till quite modern times. He should say that the making of ugly pottery was one of the most remarkable inventions of the present civilisation. Having briefly referred to the history of pottery down to the present time, Mr. Morris said that the craft who turned out such tons of commercial wares, every piece of which ought to be a work of art, produced almost literally nothing. To remedy the present state of things, they should ask for the right article, and make quite clear what it was they wanted. As to the kindred art of making glass vessels, it was much on the same footing as the potter's craft. Never till their own time had an ugly or a stupid glass been made. A slight tint was of advantage to the metal, and so were slight specks and streaks; but the idea nowadays was to get the glass colourless. Passing on to weaving, the lecturer said that its interest was limited by the fact that it was mechanical, since the manner of doing it had, with some few exceptions, varied little for many hundred years. Though mechanical, it produced very beautiful things, which an artist could not disregard. The craft was not a dull one if the workmen were set to do things which were worth doing. As the designing of woven stuffs fell into degradation in the latter days, the designers looked about for trivial novelties, seeking change for the sake of change, and the seriousness of the work was quite destroyed. Its *raison d'être* was that it gave scope to the application of imagination and beauty to any cloth, thick or thin, close or open, costly or cheap. As to the art of carpet-weaving, historically it belonged to the East; but, whenever the art began among themselves, he feared it might also be said to end with the seventeenth century. He could not agree with the opinion he had heard expressed that carpets could only be made in the East; but, delightful as they were, however, they were the products of a falling art. As to the Persian floral designs, there were still a few of these in existence. One thing seemed certain: that if they did not set to work making their own carpets, it would not be long before they would find the East failed them; for the last gift of the sense of harmonious colour was speedily dying out in the East before the conquests of European rifles and money-bags. In respect to the art of tapestry-weaving, it must be spoken of in the past tense; but yet it was a noble art once, and when it was at its best it took the place in Northern Europe of the fresco-painting of Italy, some of the very best artists spending the greater part of their time in designing for this art.

No craft had been so oppressed by the "Philis-



times" as that of the dyer. The public were ignorant as to their real wants, and the oppression of the craft belonged almost wholly to their own days. The ancient Egyptians knew well the niceties of the art. He himself had dyed wool red by the self-same process that the Mosaiical dyers used, and from the remotest times the whole art was thoroughly understood in India. About twenty years ago the trade had been revolutionised owing to the introduction of colours which were the product of coal-tar, they being brighter and stronger than the old dyes, much cheaper in price, and infinitely easier to use; but every one of these colours was hideous in itself, whereas all the old dyes were in themselves beautiful colours. In the circumstances the new dyes must be considered as possessing a negative virtue; they were as fugitive as the older ones were stable. Unless all art was to disappear from their woven stuffs, they must turn round and simply reject the new dyes, which must be relegated to a museum of scientific curiosities. The art of dyeing naturally led him to the art of printing on cloth, which was really a very ancient art, since it was not essential that the pattern should be printed. It had suffered grievously from the degradations of dyeing. If they were not to have any beauty in cloth-printing at all, why should they trouble to have a pattern of any sort on their cotton cloths? Referring to house furnishing, the lecturer said that if their houses were built as they should be, they would want but little furniture, and be happy in its scantiness. Even as it was they should, at all events, take, as one maxim, the less the better. Excess of furniture destroyed the repose of a lazy man, and was in the way of an industrious one. Simplicity was the one thing needful in furnishing,—firstly, as to quantity, and, secondly, as to kind. The arrangement of their houses ought surely to express the kind of life they led or desired to lead. Amongst the middle class it had a kind of orderly intelligence which was not without some value. Their furniture should be solid and well made in workmanship, and in design should have nothing about it that was not easily defensible; it should be made of timber rather than of walking-sticks. Let their first thoughts be of the walls, for they made the house and home, and if no sacrifice was made in their favour, they would find places had a kind of make-shift lodging-house look about them, however rich and handsome their movables might be.

Coming to the last of the lesser arts, he said that he approached the art of dress with terror, because civilisation had settled for the male sex that art should have no place in their clothes, and that they must, in this matter, occupy the unseemly position of critics of their betters. He bowed to that decision, rebel as he was, though he found it difficult to admit that a "chimney-pot hat" or a "tail-coat" was the embodiment of wisdom in clothes philosophy; and sometimes, in his more sceptical moments, he puzzled himself in thinking why, when he was indoors, he should wear two coats,—one with a back and no front, and the other with a front and no back. However, he had not near enough courage to rebel against these stern sartorial laws, and after all, one could slip in and out of the queer things with great ease. He learned with terror that the present fashion in female dress was on the verge of a change, because, for a good many years past, in spite of a few extravagances, the dress of ladies in England had been highly satisfactory. Between the dates of the Battle of Waterloo and the Ascension of Queen Victoria, a style grew up which one might call "grim modern respectability." On this period gradually crept the fashion for the crinoline. It conquered something for its predecessor in that, on the whole, it allowed women to arrange their hair naturally and gracefully, but in everything else more blatant vulgarity was apparently what it aimed at. The most hopeful sign of the present period was freedom in dress, which had not been the case formerly, for now a day a lady might dress quite simply and beautifully, and yet not be noticed as having anything peculiar or theatrical in her costume. Extravagances of fashion had not been lacking to them, but no one had been compelled to adopt them; every one might dress herself in the way her own good sense told her suited her best. The first and greatest necessity of rational and beautiful costume on the part of ladies was that they should exercise liberty of choice, so he begged them to battle stoutly for it, or they would tumble into exploded follies again. Their only

chance of keeping that liberty was by resisting the imposition on costume of unnatural monstrosities. Garments should veil the human form, but neither caricature nor obliterate its lines. The body should be draped, but neither sewn up in a sack nor stuck in the middle of a box. Drapery, properly managed, was not a dead thing, but a living one, expressive of the endless beauty of motion; and if this were lost half the pleasure of the eyes in common life was lost. They must especially bear this in mind because the fashionable milliner had chiefly one end in view, viz., how to hide and degrade the human body in the most expensive manner. She (or he) would see no beauty in the Venus of Milo, and looked upon them as scaffolds on which to hang a bundle of cheap rags which could be sold dear under the name of a dress. If ladies did not resist this to the bitter end, costume was ruined again, and all the males were rendered inexorably unhappy; so he begged of them fervently not to allow themselves to be upholstered like arm-chairs, but to drape themselves like women. Resist change for the sake of change; this was the very bane of all the arts. If they did not resist this stupidity it became a frivolous waste of time. They should insist on having materials for their dresses that were excellent and beautiful of their kind, and when they had a dress of even moderately costly materials, they would not be in a hurry to see the end of it. This was a thing which would help the weavers, body and soul, and in a due and natural way, not like the too-good-natured way of Lady Bective, who wanted them to wear stiff alpaca, so that the Bradford capitalists might not have to change their machinery. If they would weave ugly cloth, let them take the consequence. But one good thing bred another, and a good fashion had been attained to, and a love of beautiful things for their own sakes, and not because they were novelties, was human, reasonable, and civilised, and would help the making of wares, and also help both master and man, giving them time to think of beautiful things, and thus would raise their lives to a higher level.

In conclusion, the lecturer said that the lesser arts of life must be practised; it only remained, therefore, for them to determine whether they should but minister to their material needs, receiving no stimulus and help from the cravings of their souls; or whether they should really form part of their lives, material and spiritual, and be so helpful and natural that even the sternest philosopher might look upon them kindly and feel helped by them. They should look open-eyed at art and with all sincerity. He wanted the democracy of the arts established; he wanted every one to think for himself about them, and not to take things for granted from hearsay. Of course, such independence must spring from knowledge, and it would bring about intelligent and worthy citizens.

#### COLONEL CHESNEY, R.E., AND THE "STANLEY ENGINEERS" OF INDIA.

Sir,—A letter has been published, signed by Col. C. Chesney, R.E., late Principal of the Royal Engineering College, Cooper's-hill, in which he endeavours to defend the engineers turned out by that Institution at the expense of the so-called "Stanley Engineers" or old Competition Wallahs. I, being one of the "Stanley Engineers," think it my duty to correct Col. Chesney's mis-statements in as public a manner as they were made, and I trust, for this reason, you will be good enough to publish this letter in your widely-circulated journal. The first misstatement I would draw attention to is the following:—

"Some of them (Stanley Engineers) may have had some practical training, but a large proportion \* of them had had none whatever. The conditions of admission to the Indian Public Works Department in those days were the passing a very elementary examination, and the having served for one year as pupil to an engineer. But as it was not specified what sort of an engineer they were to serve under, or what amount of practical training they were required to undergo during that year, and as any one who chooses to do so may dub himself a civil engineer and take pupils, practically the preparation of a large proportion of these young engineers had fallen into the hands of a few 'crammers,' who lived in London; who had no professional

practice to speak of; and who worked up their pupils to pass the needful examination in mathematics and the elements of surveying. The so-called pupillage, in fact, instead of being pupillage under an engineer as was intended, had in many cases degenerated into pupillage under a tutor. As a means for selecting engineers, trained or untrained, the examination and the test were a mere sham."

So far as the engineers that I was acquainted with, who came out to India in 1866, 1867, and 1868, are concerned, I know for a fact that most of them had received a good college education, and had been pupils of engineers in the United Kingdom of known position and repute. These young engineers, I may mention, possessed both technical and practical qualifications of no mean standard, and proved this by passing the test laid down by the Secretary of State. Some of the Stanley men were articled for periods varying from three to five years, and some even had been assistants up to the time of their examination, or "sham test" as the gallant Colonel calls it. Col. Chesney, I observe, would have the public believe that the engineers to whom the greater portion of the Stanley men were articled were a body of quacks! I do not know what these worthy gentlemen will think of this insult, for it is nothing more nor less. Any how, it would, I submit, have been in better taste had Col. Chesney reserved his remarks, and so spared the feelings of many honourable gentlemen who are still living.

As to the conditions of admission to the Public Works Department, and the examination the Stanley Engineers had to pass, I would refer Colonel Chesney to the papers of what he calls the "sham test" published by Messrs. Hauser & Co., of Great Queen-street, London, by order of the House of Commons, and in your paper in the years the examinations were held. The conditions, he will find, were most strict, and were rigorously carried out by the India Office authorities. The examinations were most searching and complete, and were conducted by eminent professors and officers appointed by the Secretary of State, such as the late Professor J. Cape, Mr. George White, C.E., and the late Colonel C. D. Newmarsh, R.E. (vide the opinions of the leading professional engineering journals published at that time), and I think therefore that Colonel Chesney's remarks as to "sham tests" can only be intended as a slur on the India Office authorities for the careless manner in which he supposes they conducted these examinations.

It is evident that the Colonel has but a superficial knowledge of the subject he has written about, and that he has not even taken the trouble to search for facts before making such assertions. It reminds me very much of the statement made by the Duke of Argyll in the House of Lords in July last regarding the failure of the barracks at Allahabad, which he attributed to the gross ignorance of the civil engineers of the Public Works Department, but which turned out on inquiry to be attributable to the Royal Engineers.

It is to be regretted that officers holding high State positions should lower themselves in the estimation of the public by making such rash and unfounded statements, as there is no possible excuse for their so doing, they having every opportunity of getting at facts if they will only take the trouble to do so.

As to the few London "crammers" into whose hands Colonel Chesney says the greater proportion of these engineers had fallen, the statement hardly needs comment, but I would again refer him to the Parliamentary Papers before alluded to, and he will find from them that the greater portion of the "Stanley Engineers" had undergone an expensive technical education at some university or college recognised by the Secretary of State, and had been articled to well-known engineers residing in the United Kingdom. I know for a fact that many of the Cooper's Hill students are sent to the very firms of Engineers ("quacks," as Colonel Chesney implies) for their period of practical training, varying from six to twelve months, whereas many of the "Stanley Engineers" were articled for terms of from three to five years. The great advantage Government gained in obtaining engineers in the open market by the old competitive system was that they obtained a class of men who were thoroughly technical and practical engineers at the absurdly low rate of Rs 170 per month,—men who were sufficiently experienced to be placed in charge of large works when they arrived in India. I regret to say that this cannot be said of the

\* The italics are mine.



Cooper's Hill students, who are, after all, mere schoolboys, and are of very little use to the State until they have had at least two years' experience in the country at Government's expense. This is a well-known fact to unprejudiced officers serving in the Public Works Department in India.

Any number of men could have been obtained under the old competitive system had the same advantages of pay and the other inducements been offered to them as are now offered to Cooper's Hill students, and it would have been by far the most economical, efficient, and best system for the State. Rs.350 per month for raw Cooper's Hill students is a very different matter from the miserable pittance of Rs.170 per month for qualified professional men to start with in India. There is no doubt this is the key to the failure of the old system. It was not through the inferior quality of material obtained in the open market, as Colonel Chesney wishes the public to believe, but rather because a sufficient number could not be obtained at the rate of pay offered. If Colonel Chesney is unable to see for himself what kind of service the Stanley engineers have given in India, he will, if he will only make the necessary inquiries, find that these engineers are second to no other class of officers in the Public Works Department. Several of them have had, and still have, some of the largest public works in the Empire under their charge and control, and, what is more, their works have not failed. Not only does Sir A. Clarke's unbiased opinion bear out this, but it is also the opinion of all other disinterested professional authorities.

As before stated, any number of qualified engineers can be obtained by open competition, if proper inducements and a fair share of the prizes in the service are offered, instead of the bulk being monopolised by the Royal Engineers, as at present. Even the Cooper's Hill Institution is managed by well-paid officers of the Royal Engineers, and I believe it will be found that they monopolise the best paid engineering appointments in that Institution. It appears, then, in order to secure a pension for service in India, and, in addition, to find comfortable quarters and a good salary as Principal or Professor at Cooper's Hill, one must needs be a Royal Engineer. No wonder, then, that Colonel Chesney upholds his pet college, but he will find that it will only answer for a few years longer, as it is rapidly losing the popularity it at first enjoyed. The general opinion, both in India and at home, is that the sooner this Institution is closed the better for the Government and the Indian tax-payer.

AN ABUSED STANLEY ENGINEER.  
India, February 28.

## A NATIONAL GALLERY OF ARCHITECTURE. TURAL MODELS.

As Music is (under Royal auspices) about to receive a permanent representation in the establishment of a National College of Music, so Architecture should, from its importance, be equally represented by a similar institution.

The profession of the architect stands second to none in the amount of versatile ability required. In addition to the time, study, experiment, travel, and research, involved in its pursuit, there is no profession which necessitates so intimate a knowledge of other arts and sciences, and of those materials and mechanical trades with which it is brought into immediate connexion. Did England, like France, possess a National School of Architecture, like the Académie des Beaux Arts, the interests of the profession would be advanced, a taste for architecture would spring up among the people, and in developing this taste a great improvement would take place in our public buildings and domestic dwellings.

The Building Exhibition, recently held at the Agricultural Hall, Islington, is a step in the right direction, and it is to be hoped will be the forerunner of future exhibitions.

At the last Paris Exhibition, architecture took a very prominent position, and models formed an important collection.

While England may favourably compare with other countries in the beauty, grace, and majesty of design of the edifices which adorn her land, she possesses no gallery of architectural models affording an interesting study to the architect, the student, and foreign visitor.

How best to promote a taste for architecture is a subject well worthy the attention of the

Royal Institute of Architects, and the foundation of a National School of Architecture would be the only means by which this could be effected.

Beyond the Architectural Museum in Tafton-street, Westminster, and a meagre display of models at South Kensington Museum, the public have but very little to instruct them. In establishing a National School of Architecture, the first great requisite would be a collection of highly-executed models to scale of the principal public buildings, ancient, mediæval, and modern; besides others showing types of construction of roofs, vaults, bridges, &c., and other architectural elements. People are more easily taught by models than by drawings.

You can walk round a model where you cannot round a drawing, and you can convey to the eye of an observer a clearer idea of what a building would be like upon erection than by a series of drawings, however accurately made. Germany, France, Italy, and Switzerland have each their National Gallery of Architectural Models; England is unfortunately without so valuable an exhibition. In Germany, a model (and, if necessary, a working model) is required before an invention can be patented.

One of the greatest difficulties in establishing a Gallery of Architectural Models would be getting a sufficient collection of well-executed models illustrative of everything that is important and interesting in architecture. To obtain this a staff of artists would be required. These would have to be trained, as the art now is almost obsolete.

That modelling is a pursuit which is much taken to by the youth of the land is evidenced by the number of models we see at working men's exhibitions, but the examples shown are very seldom constructed to scale, and have not that geometrical accuracy and fineness of detail necessary in a high-class model.

A model cannot be made too faithful an embodiment of an architect's design; the more it is so, the more it becomes a work of art, and thus an object of national interest, and when it becomes an object of national interest it advances the interest of the architect and of the profession to which he belongs.

The profession of the architectural modeller is one which requires an inexhaustible fund of patience, a mathematical accuracy and delicacy of workmanship, and an inventive genius worthy of a higher profession.

To the architect, his client, and the public, a gallery of architectural models would be invaluable. The architect would be spared spending a great portion of his time in going abroad upon a hasty and discursive sketching tour; his client would have an abundance of examples of the style in which he would like a building erected, and the public would be able to compare the difference and various merits of different styles of architecture: buildings which would take years of travel to visit would be brought before it in their miniature representations, and much valuable, historic, and interesting information would be obtained.

Did such an exhibition exist, it could be divided into various sections or departments, one devoted to ancient architecture, British and foreign; another to illustrations of the various periods of Gothic architecture; others to representations of public buildings, country and town mansions, cathedrals, churches, temples, museums, public memorials, monuments, the stately homes of England, principal bridges, viaducts, breakwaters, lighthouses, tunnels, &c.

No building of any importance should be erected without a model being previously constructed. A good model not only assists the artist in the correction of his design, but is also a test of the accuracy of his draughtsmanship. The cost of a model should be no objection to having one made. You can pull down a model, alter or add to it, much cheaper than you can a building. The architect's client would be saved that expense, vexation, and disappointment which these highly-got-up drawings create, being frequently drawn from the most impossible point of perspective. The importance of models in legal cases, in disputes regarding boundaries, rights of way, and questions of light and air, will be acknowledged by judge, counsel, and juryman.

Modelling is not a modern invention, but is as ancient, almost, as building itself. The early architects were mechanics as well as designers and draughtsmen. They could use the tool as well as the pencil. Models are frequently to be seen in the hands of statues of founders and

benefactors. Christopher Wren made models of his churches; one is still preserved of St. Paul's, also of St. Giles's. An architectural student would attain higher progress in his profession by being a successful modeller. It is true photography has done much to do away with models, as any number of perspective drawings can be obtained; but these, even at the best, fail to give to an observer that fulness of idea with which he can grasp a building in all its parts,—the relation that one part bears to another and the whole, the recesses and projections, roof, plan, system of ventilation, drainage, &c.,—when a well-executed model is employed.

One cause of architectural modelling not being brought into greater requisition is that models take so long to construct. This could be obviated by employing a sufficient staff of assistants, that a model might be constructed almost as rapidly as the architect could prepare his drawings. Another reason why models are not more frequently used is that they are often so indifferently constructed as to become more like caricatures of an architect's design than any real embodiment of it. An ill-constructed model is worse than useless, as it is neither guide nor ornament. High-class models are not only valuable as works of art, but as sources of instruction.

In exhibitions where models are displayed they are placed considerably too low, so that the spectator looks down upon the roof instead of looking up at the building. The surroundings to a building, as the lawn, terraces, fountain, statues, statuary groups, flower-beds, shrubberies, &c., should have their due representation in a model, as giving effect to the architecture.

The material in which models should be constructed depends upon the class of building to be represented. Cork is admirably adapted for representing ruins of old castles and abbeys; paper or cardboard, where cheapness is an object; and plaster for illustrating temples, monuments, coliseums, where the building is of stone or marble. Wood is the most eligible of all materials, as it is easily carved, bent, and moulded, and you can obtain it almost of any colour. It admits of much fineness of detail, and models made of this material can be easily cleaned, added to, or altered. By using wood of different colours, to represent the different materials of which a building is composed, and inlaying them, gives to a model a more realistic appearance than can be effected by the use of cork, cardboard, or plaster. Models made of wood are not liable to damage in transit. Models constructed on this principle avoid the roughness of the cork, the toy-like effect of the cardboard, and the monotony of colour peculiar to plaster models. The model of Preston Hall, Aylesford, Kent, the seat of Mr. H. A. Brassey, is the only public one of this kind. It is now in the South Kensington Museum, where can be seen others of the kinds above mentioned. The subject of architectural modelling is one that might well be taken up by the Royal Institute of Architects, and, no doubt, under their fostering auspices, which the architecture-loving public might be induced to cherish, a foundation of an architectural model gallery might be laid, and thus plant the germ of a national school of architecture. W.

## PUBLIC BATHS FOR BATTERSEA.

THE question of erecting public baths and washhouses for Battersea, which has for some time past been under consideration, was decided in the affirmative a few days ago, so far as regards the baths, but not without considerable opposition having been manifested by some members of the Vestry, and a number of dissentient ratepayers. The erection of washhouses in connexion with the undertaking has been abandoned, and the sanction of the Vestry is given to the Commissioners empowering them to borrow the sum of 25,000*l.* for the purpose of erecting baths. It is stated that plans and provisions have been arranged by which the bath could be covered over when desired, and a winter gymnasium created.

## FUR IN KETTLES.

SIR,—Can any of your readers tell me what is the best way to get the slate off the inside of a copper tea-kettle without the use of the hammer? We use boiler fluid for the same purpose in steam boilers, but should be afraid to use it in a tea-kettle. This is a very small matter, but the information would be very useful. W. P.



## THE TREATMENT OF CONCRETE.

SIR,—I hope you will not think the excellent advice you gave in your issue of the 25th ult. as to the non-advisability of copying other materials in concrete is neglected by me from any disrespect to your experienced judgment; the difficulty lies in the apparent impossibility of making concrete, as concrete, look well. On the Palatine Hill are the ruins of the Palace of the Cæsars. The basement wall is of concrete, with the marks of the joints of the boards still on it, and the remains of slabs of marble about 1½ in. thick, with which the walls were covered, still exist.

In Pompeii the ceiling of the baths is of concrete, faced with some white cement, most beautifully modelled; the columns of the various temples are faced with red cement; the walls of all the houses are painted with frescoes; there are acres of floor space covered with marble mosaic on a concrete bed. So here are four methods of facing concrete, in none of which is the material seen.

In Venice, the walls of St. Mark's are lined with glass mosaic of various marbles; what the groundwork is I do not know, but I examined a damaged pilaster on the principal front, and found behind the marble panel, which was less than ½ in. in thickness, a backing of concrete.

At Versailles, the lodges to the park are plastered with red plaster, and lined with lime putty in imitation of brickwork. I do not know whether concrete is underneath, but in many parts of Paris this same treatment can be seen.

In Amsterdam is a new building of concrete tinted and jointed to represent stone; it would be taken for a stone building without close examination. I saw it in the concrete-maker's yard, with every block marked ready for erection.

At Haarlem is a manufactory of concrete bricks, and for hardness, truth, and weather-resistance superior to any clay bricks that I have ever seen; yet they have to be made so as to resemble a clay brick in colour and shape. I have one in my possession. Here we have a superior article made to resemble an inferior one, to overcome the prejudice against new things. Therefore the difficulty of treating concrete to make it look well has always been felt, and it has always, as far as I know, been faced with some other material. It is not generally known that concrete can be carved, and that it stands up sharp and crisp under the chisel. It must not, however be left too long, or it gets as hard as flint. I exhibited some carved panels in the Paris Exhibition of 1878 designed by Mr. R. Norman Shaw, R.A., and I have had a small one exposed to the weather ever since. I will send it to my shop, 35, Poultry, together with the brick from Haarlem and a piece of concrete 2,000 years old, given to me by a priest of the Pantheon at Rome, and dug out in my presence from the excavations going on, by the time this is in print, so that your readers can call and see it if they wish to do so.

At the corner of Wells-lane, Hampstead, the carvers are now at work carving the string-course round Mr. Ewan Christian's own house in my red concrete.

At the bottom of Fitzjohn's-avenue, near the Swiss Cottage Station, there is the wall I have just built to match the old building there, Messrs. Lander & Bodella, architects. The carvers are now carving the bosses and crockets in grey concrete.

When the material is fresh cast it can be cut with great facility; in fact, it can be cast roughly to the pattern required, and tooled off when it gets hard enough. By this means you would get the effect with no waste of labour.

I do not profess to be anything but a worker in concrete, ready to carry out, as well as I can, any work that is placed in my hands. If any architect thinks he can treat concrete better than it has been treated, I promise I will do my best to carry out his ideas. I have to make what the public will buy, and for me to pretend to dictate to the public as to what they should like and what they should not, would be absurd. You will see I have not been idle. Anything good I am always glad to copy, and anything bad to avoid; and if any of your readers will make any suggestions worth hearing, I shall be only too glad to try and carry them out. I do not, however, see that in facing concrete with imitations of other materials I am doing wrong. The Romans faced it with imitations of marble because marble was their best building material; the Venetians with marble

and glass mosaic, the latter being their great speciality; the French with anything in the world that would look well. I inspect the French must laugh finely at our straight-laced sanctimoniousness, and whilst we are discussing amongst ourselves what is right and proper, they set all our regulations at defiance, and teach the whole world the art of pleasing and successful decoration. Whilst the Dutch, the honest sober Dutch, make most excellent bricks, still you see the product for which they are famed, and wherever have I differed from them? My great crime seems to be in making wall-tiles. Well, there are thousands and thousands of cement floor-tiles very small all over the Continent; it is difficult to pass any large building works without seeing them. I have seen them in Brussels, in Paris, in Florence, in Rome. Why, in Mentone, where the Queen is now staying, instead of the beautiful sloping beach, as the illustrated papers show, evidently copied from old sketches, there is a sea-wall and a capital foot-path the whole length of the bay and faced with cement, divided into squares to look like stones; and if floor-tiles are so common, where is the sin of making wall-tiles? Where is the Act of Parliament that says "Tiles shall be made of clay only"?

Is it wise for us to sit at home and say we are thankful we are not such Goths as those foreign architects; we are in the right, all other people are in the wrong; we merely study their stupid proceedings to condemn them? Let us get out of our holes and corners and see what the world is about, for if we seek to concoct rules for the regulation of society in our back parlours, we shall find one day society is gone on ahead and left us high and dry, and to our great disgust and astonishment, that the world has actually learned to do without us. W. H. LASCELLES.

## ANGORA.

DR. KARL HUMANN, the discoverer of the great altar and other important relics of Pergamon, is on the point of commencing, with the assistance of Herr Höfler, an Austrian antiquary, a series of excavations at another interesting spot in Asia Minor, to wit, Angora, the ancient Ankyra, in Galatia. This city, which was still flourishing in the times of the Roman emperors, is known to be very rich in monumental remains, containing important inscriptions, some of which have already been brought to light by M. Texier and other travellers. The steep citadel of Angora is surrounded by treble walls which are built of blocks of ancient masonry, many of them containing inscriptions. The best known of the inscriptions of this place is that of the so-called *Monumentum Ancyranum*, which stands in the ruins of the Temple of Augustus. It is in Latin, and is inscribed on a tablet. It consists of a large portion of the will and testament of the emperor, and describes not only his principal actions, but, what is particularly of architectural interest, it gives a list of the chief edifices he caused to be constructed. It is Dr. Humann's first object to obtain an exact facsimile of this important inscription, after which he will turn his attention to the other principal remains of antiquity at Angora.

## EGYPTIAN ANTIQUITIES.

A SOCIETY has been formed for the purpose of excavating the ancient sites of the Egyptian Delta, and the scheme has been started with a reasonable prospect of success. The general plan drawn out has received the approval of many distinguished persons, including antiquaries and Egyptologists.

A meeting was held on the 27th ult., at which Sir Erasmus Wilson took the chair, supported by Mr. H. Villiers-Stuart, M.P. Sir Erasmus Wilson was elected hon. treasurer, and Miss Amelia B. Edwards and Mr. Reginald Stuart-Poole hon. secretaries. The society is already in correspondence with M. Maspero with the object of beginning its operations as soon as sufficient funds are provided. It is proposed to raise a fund for the purpose of conducting excavations in the Delta, which up to this time has been rarely visited by travellers, and where but one site (Zaan-Tania) has been explored by archaeologists.

Besides the sites connected with Hebrew, Hellenic, and Phœnician history, the Delta is rich in mounds of famous Egyptian cities, as

Sais and Xois. In order to examine these sites, it will, in the first place, be necessary to raise a sum of money for the purpose of making a tentative exploration. Should this sum suffice, the two sites of Goshen and Nakkrasis could be simultaneously excavated, otherwise Goshen would have the preference.

## LINDSEY HOUSE, CHELSEA.

THE house No. 100, Cheyne-walk, Chelsea, is advertised to be sold by auction on the 20th of April by Mr. R. W. Mann, for Messrs. Trollope. This house is the westernmost of the four houses into which the fine mansion known as Lindsey House is now divided. It was formerly divided into five houses by party-walls, but in 1875 the two westernmost houses were thrown into one, and extensive repairs and alterations carried out to them, under the superintendence of Mr. G. Devey. There are some handsome wood and marble mantelpieces, similar to those put up by Wren at Hampton Court, from which it has been inferred that the house was designed by Wren, but of this there is no evidence; and in the ante-room off the landing on the first floor is a fireplace, with marble jambs and wood mantel over, designed by Mr. Philip Webb. The house has been for some years the residence of Mr. A. B. Mitford.

Lindsey House was built about 1660 by Robert Bertie, third Earl of Lindsey, a staunch Royalist, who fought and was wounded at the battle of Naseby. In 1705 it was in the occupation of Ursula, Dowager Countess of Plymouth, and her son, Lord Windsor. It was afterwards occupied by Lord Conway, whose son, the Earl of Hertford, was born there in 1718; and by Count Zinzendorf, the founder (or rather restorer) of the sect of the Moravian brethren, who purchased the house and a portion of the garden of Beaufort House, for the purpose of establishing a centre of a community of 300 families, who were to work at a factory. The scheme for the settlement, which was to be called "Sharon," was not successful, but Lindsey House was used for many years as a conference-hall and a temporary home for the Moravian missionaries. The portraits and other paintings by Haiddt with which the grand staircase was adorned, were removed to the Mission-house in Fetter-lane, on the departure of the Moravians, who sold the house in 1770. The house No. 99, Cheyne-walk formed part of Lindsey House, and was the easternmost wing. It was formerly in the occupation of Mr. Whistler, who decorated the entrance passage with sketches in the Japanese manner. On the first floor, in a room which was used by Mr. Whistler as a studio, is an oak door, with a beautifully carved architrave, which the artists frequently made use of as a background. This house was at one time in the occupation of Henry Constable Jennings, a celebrated collector, who impoverished himself by his passion for the acquisition of curios, and died within the rules of the King's Bench prison.

## REBUILDING THE LIVERPOOL ROYAL INFIRMARY.

IN consequence of its having become altogether unequal to the necessities of a constantly increasing population and to the requirements of the times, the Royal Infirmary at Liverpool, which was one of the first of its kind in the North of England, is about to be rebuilt, at an estimated cost of 100,000l. The rebuilding was decided upon at a meeting of the subscribers to the institution which was held a few days ago, when it was shown that the present building was not only far too small, but in every respect unsuited for the purposes to which it was applied. Amongst the speakers was Mr. Wm. Rathbone, M.P., who said they were now supporting, with diminished efficiency, a building which was more than sufficient for our ancestors fifty or sixty years ago, and that was not a state of things which could be looked upon with satisfaction or toleration by the citizens of Liverpool. The Infirmary was now absolutely unsuitable and improper for the wants of modern times. They required better sanitary arrangements, a fuller supply of air, and above all, more space. Mr. Gilmour, one of the trustees, endorsed Mr. Rathbone's remarks, observing that they were in want of most of the modern appliances and conveniences, and of light, air, and space, and it was absolutely necessary that



the building should be entirely reconstructed. They had delayed the matter as long as they could, and the work must now be proceeded with. Dr. Waters and Mr. Bickersteth, two of the medical gentlemen connected with the institution, gave strong and conclusive reasons in favour of its rebuilding.

It is believed that in the erection of the new building the pavilion principle will be adopted. The site of the Infirmary faces a large open space which the Corporation are about to form by the closing of a street, involving the demolition of a large number of houses on both sides of this street. The intention is that on this open space no building is to be erected except the new University College.

THE CLERKS OF WORKS' ASSOCIATION.

A MEETING of Clerks of Works, for the purpose of forming this Association, was held, by permission of Mr. John Oldrid Scott, F.R.I.B.A., at 32, Spring-gardens, on the 27th ult. A letter which appeared in the *Builder* in December last, and some subsequent correspondence, relative to the advisability of forming a society of Clerks of Works, was the primary means of calling attention to the subject. That an association, based on sound principles only, and which admits to its ranks none but men of probity and possessed of sound practical knowledge, may be of service to each other, as well as a medium for architects in want of assistance, and members in need of employment, admits of no doubt. The principles advocated at the meeting were essentially opposed to any form of trade unionism, and against anything of a benefit or provident character, the general view being that advantages of this kind can be insured much more readily, and with more certainty, by properly-organised provident institutions. The advisability of forming a library resulted in a decision to establish one of a circulating character, so that members whose duties called them to various parts of the country might have the advantage of obtaining and interchanging books relating to architecture and building.

In the course of some remarks made at the meeting as to the probabilities of success, it was remarked that although architects had nearly twenty societies spread over the country at large, and the Architectural Association possessed 700 members in London alone, yet clerks of works had never attempted to form or maintain a single association (except one in connexion with builders' foremen), the result of which was that they as a class were more isolated than any equal number of men in the country, following one special occupation. A considerable number of members were enrolled, and judging from the unanimity of those who were present, it may be hoped that the society will eventually gather within its fold a great proportion of the better class of clerks of works. With the view of enlisting architects in their favour, the standard of efficiency fixed upon was a high one, as no one will be considered eligible for membership who has served less than three consecutive years as clerk of works, or is known to have anything against his moral character. The society determines to be self-supporting if possible, but it was hinted that donations of books towards the library would be acceptable, otherwise some time must elapse before the funds would permit of purchasing sufficient to supply all the members.

It was intimated that Mr. J. O. Scott was willing to become Treasurer of the Association, and, moreover, generously offered one of the rooms at 32, Spring-gardens, for use as an office room. Mr. G. R. Webster was elected secretary without a dissentient, and a committee as chosen to put into form the resolutions passed by the meeting.

DISTRICT SURVEYORS' FEES.

At Hammersmith Police-court, Mr. E. B. Aron was summoned by Mr. Knightley District Surveyor of Hammersmith, who sought to recover the sum of 8*l.* 12*s.* 6*d.*, being fees in respect of three houses erected in Haelet-road, in H. Kisch, barrister, defended, and contested a claim. The question is of importance to District Surveyors, as it has reference to the fee when their fees become due. Mr. Knightley said the defendant was not the silder of the houses, but he was the owner at the time the fees were due. Mr. Kisch relied on the section in the Act

stating that the fees became due one month after the roof was covered in. He had evidence to show that the roof was covered in months before the property was transferred to the defendant.

The complainant called his clerk to prove that the roofs of the three houses in question were covered in at the end of June. He also called the defendant's solicitor, who stated that the property was assigned in that month.

Mr. Kisch called Richard Nicholls, the builder, who stated that the roofs were covered in during the month of November, 1880.

Mr. Knightley, in reply, admitted that the main building was covered in at that time, but said his contention was that the whole was not covered in until June. It was the practice of some builders to delay covering the out-buildings to obtain time to pay the fees. He submitted that it was his duty to see that the whole was covered in and not part.

Mr. Paget dismissed the summons, and ordered the complainant to pay three guinea costs.

Mr. Knightley wished to give notice of appeal, as the decision was wrong.

Mr. Paget referred to the Act, and said there was no power of appeal.

Mr. Knightley then asked for an adjournment to enable him to instruct counsel, as the question was of great importance.

This application was refused.

A SANITARY SONG FOR AN INFANTS' SCHOOL.\*

To grow up tall and strong,  
And not quite dwarf'd and lean,  
I must be very sure  
To wash my body clean.  
Not just my hands and face,  
That everybody sees,  
But neck, and back, and chest,  
And feet, as well as knees.  
Then, often I must change  
The clothes worn next my skin;  
And I should keep my boots  
Quite dry, and not too thin.  
My teeth, too, I must brush,  
My hair keep comb'd and neat;  
And, next, my little bed  
Must be well-air'd and sweet.  
My food must be quite plain,  
And good and fit for me,  
Like bread, and meat, and eggs,  
And coffee, milk, and tea.

The water that I drink  
Must be quite clean and pure,  
Or sickness I may have  
That will be hard to cure.  
And exercise I need  
Out in the open air:  
Now, all these things cost nought,  
Except my daily fare.

S. W.

**City of London College.**—The foundation-stone of a new building for this institution was formally laid on the 31st ult. by the Lord Mayor. His lordship, who was accompanied by the Lady Mayoress, went in state with the sheriffs to the site of the new college in White-street, Moorgate-street, and was received by the Rev. Prebendary Mackenzie, chairman of the council, the Rev. Prebendary Whittington, the Principal, Mr. C. Bell, Mr. H. C. Richards, Mr. G. C. Kendrick, and other members of the council. Although of the 15,000*l.* required to complete and furnish the edifice, only 8,300*l.* has yet been subscribed, the friends of the City of London College hope that before the building is finished in September the remainder will be forthcoming to enable them to start free of debt. The new edifice is Collegiate Gothic in style, and it will be built of red bricks, with Portland stone facings. There will be two frontages, one in White-street and the other in North-street, Moorfields. The frontage in White-street will be about 101 ft., and in North-street 45 ft. There will be a tower at the south-east angle with a small spire. The building will comprise a large hall on the basement and ground floors, and three floors of class-rooms, laboratories, and art-rooms, the latter of which will be on the top floor so as to have the benefit of the light from the roof. The building is expected to accommodate 4,000 students. Mr. Edwin A. B. Crookott, of Mark-lane, is the architect, and Mr. J. T. Chappell is the builder.

\* A correspondent, who thinks it is never too soon to begin to learn salutary facts, sends us these lines.

ELECTION OF THREE DISTRICT SURVEYORS.

At the meeting of the Metropolitan Board of Works on Wednesday last, applications were received from candidates for the District Surveyorships for the undermentioned districts:—Woolwich (vacant by the resignation of Mr. G. Atchison); St. Saviour, St. George the Martyr (part), and Christchurch, Southwark, and the northern division of Lambeth (vacant by the resignation of Mr. T. Roger Smith); and the Pimlico and Belgrave division of St. George, Hanover-square (vacant by the death of Mr. George Legg). There were thirty-three candidates.

On the motion of Mr. J. E. Saunders, chairman of the Building Act Committee, resolutions containing the conditions of appointment were agreed to, and in accordance with the usual practice, the whole of the candidates for each appointment were first voted for in alphabetical order, the six candidates who received the largest number of votes in each preliminary voting being retained with the view of making the final selection from among them.

The following is a list of the candidates, showing the preliminary voting for each appointment, viz.:—

	Woolwich.	Southwark.	Pimlico.
Ashbridge, A.	28	19	18
Bell, R. B.	2	2	1
Bridgman, H. H.	9	9	9
Brooks, C. W.	9	5	9
Carritt, E.	21	23	25
Cheston, H.	5	8	5
Conder, A.	23	*	—
Edmondson, J. S.	18	10	14
Elkington, G. jun.	22	18	17
Ferguson, J. M.	4	1	2
Grellier, W.	5	1	2
Hewitt, E. E.	39	27	†
Hunter, P.	21	15	18
Inskip, G.	0	0	0
Jackson, G.	5	4	3
Karliska, H.	12	6	13
Large, W. A.	27	24	23
Lees, W. H.	14	15	10
McLellan, H.	13	7	7
Marsland, E.	13	14	14
Mundy, T. E.	8	7	6
Nutley, F. C.	8	6	7
Pownall, R. E.	6	3	1
Rent, O.	0	1	0
Sorymourt, W. H.	14	12	11
Smalpeice, W.	7	6	6
Stanning, A. B.	21	18	22
Stork, H. W.	8	2	2
Stone, F.	6	4	3
Street, E.	23	17	18
Tanner, A. W.	16	14	12
Taylor, A. T.	11	6	6
Todd, F.	18	17	16

\* Elected for Woolwich.  
† Elected for Southwark.

The six candidates who received the highest number of votes for Woolwich were Messrs. Ashbridge, Conder, Elkington, Hewitt, Large, and Street. The subsequent voting on this appointment was as follows:—

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Ashbridge	29	15*	—	—	—
Conder	23	17	21	21	20
Elkington	14	—	—	—	—
Hewitt	21	24	23	20	13
Large	20	21	19	16	—
Street	16	15*	16	—	—

Mr. Conder was consequently the successful candidate for Woolwich.

Southwark.

The six candidates who received the highest number of votes for the District of St. Saviour, St. George the Martyr, &c., were Messrs. Ashbridge, Carritt, Elkington, Hewitt, Large, and Stanning. The subsequent voting on this appointment was as follows:—

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Final Vote.
Ashbridge	19	15†	—	—	—
Carritt	20	15	—	—	—
Elkington	13	—	—	—	—
Hewitt	27	23	23	25	31
Large	19	20	18	11	—
Stanning	16	16†	15	14	8

Mr. Hewitt was thus successful in obtaining this appointment.

Pimlico.

The six candidates who obtained the highest number of votes for the Belgrave and Pimlico division of St. George's, Hanover-square, were Messrs. Ashbridge, Carritt, Elkington, Large, &c.

\* There being a tie here, a further vote was taken on the question as to which name should be retained for the fourth voting, when there appeared:—For Ashbridge, 14 votes; for Street, 15. Mr. Street's name was therefore retained.

† In order to ascertain which two of these three names should be retained for further voting upon, a show of hands was taken, when there appeared:—For Ashbridge, 15; for Carritt, 18; and for Stanning, 16. Mr. Ashbridge's name was therefore struck out.



Stenning, and Street. The subsequent voting on this appointment was as follows:—

	Second	Third	Fourth	Fifth	Final
	Vote.	Vote.	Vote.	Vote.	Vote.
Ashbridge .....	18	15	12	—	—
Carritt .....	20	18	16	13	—
Elkington .....	14	12	—	—	—
Large .....	21	21	19	18	23
Stenning .....	20	18	17	17	13
Street .....	13	—	—	—	—

It will thus be seen that Mr. Large was the successful candidate for this district.

#### THE CAMBERWELL IMPROVEMENTS. VALUE OF PUBLIC-HOUSE SITES.

THE Metropolitan Board of Works having now obtained possession of all the property they require for the widening and improvement of Camberwell-road, near Camberwell-green; Church-street, Camberwell; and High-street, Peckham, and having already demolished several hundreds of houses, are now proceeding with the letting of sites in the thoroughfares to be widened for the erection of new buildings and business premises which under the improvement have been swept away. Last week Messrs. Walters, Lovejoy, & Mills, at the Auction Mart, sold, by order of the Metropolitan Board, the site on which stands the Father Red Cap public-house, in Camberwell-road, opposite Camberwell-green. The site, which has a frontage to Camberwell-road and the Green of 35 ft. by 44 ft., was sold for 5,300l., on an 80 years' lease and 70l. rental, the purchaser to remove the old building, and to erect a new one at a cost of not less than 2,000l.

The same auctioneers next sold the site, on an 80 years' lease, at a yearly rental of 100l., of the Stirling Castle Inn, Church-street, Camberwell, near the parish church. It was sold for 5,800l., the purchaser, as in the first-named case, to pull down the inn, and rebuild it at a cost of not less than 2,500l.

The Metropolitan Board paid a very large sum in purchase and compensation, in order to obtain possession of this property for the purposes of the improvement, the amount being 10,000l. to the tenants for goodwill and loss of business, and a similar sum to the owners of the premises. It is stated that the total sum which the Metropolitan Board have had to pay in the purchase of property and compensation in order to carry out these improvements amounts to about 300,000l., of which sum it is not expected that they will recoup themselves to the extent of more than one-third.

#### BUILDING PATENTS.\*

##### APPLICATIONS FOR LETTERS PATENT.

1,300. A. M. Clark, London. Manufacture of embossed wall-paper. (Com. by E. Leissner, New York, U.S.A.) (Comp. spec.) March 17, 1882.

1,306. W. Simmons, Maidstone. Manufacture of hearthstones. March 17, 1882.

1,325. O. Slagg, Leeds. Drain and Sewer pipes. March 18, 1882.

1,326. O. Slagg, Leeds. Traps for drains. March 18, 1882.

1,351. J. Rattie, London. Binding for scaffolding. March 20, 1882.

1,357. J. Thom, Wolverhampton. Securing door-knobs to their spindles. March 21, 1882.

1,388. G. Ashdown & G. Kent, Portsea. Chimney-tops, &c. March 22, 1882.

1,410. N. Scott, London. Means of ingress and egress to theatres, halls, &c. March 23, 1882.

##### NOTICES TO PROCEED

have been given by the following applicants on the dates named.

March 21, 1882.

5,033. B. O'Neill, London. Manufacture of artificial marble or stone. Nov. 17, 1881.

5,039. T. Beddoe, London. Apparatus for disinfecting water-closets, urinals, &c. Nov. 17, 1881.

5,064. E. Homan, Turnham Green. Construction of fire-proof floors. Nov. 19, 1881.

172. J. Jackson, Kensington. Apparatus for mixing the materials for concrete. Jan. 12, 1882.

1,015. W. Brass, London. Reflecting pavement lights. March 2, 1882.

March 24, 1882.

1,300. A. M. Clark, London. Manufacture of

\* Compiled by Hart & Co., patent agents, 38, New Bridge-street.

embossed wall-paper. (Com. by E. Leissner, New York, U.S.A.) March 17, 1882.

##### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending March 18, 1882.

3,261. T. W. Helliwell, Brighouse. Making the glazing of glazed structures impervious to dust, air, and water.

A bar is placed between the overlapping edges of the sheets of glass so as to form a channel between the two to receive the condensed water, and a piece of indiarubber tubing is placed beside the bar to prevent the entrance of dust and air. July 28, 1881. Price 6d.

3,375. C. Parker, Amberley. Apparatus for making or forming traps for water-closets.

The moulds are made in sections for the casting of these traps, so that they can easily be withdrawn. August 4, 1881. Price 6d.

3,383. J. Shanks, Barrehead. Lavatories.

There is an upper vessel for clean water and a lower one for used water. The basin between is hinged to the wall, so that when not in use it can be turned up, and it is so fitted that the turning of the basin up empties the water into the lower vessel. August 4, 1881. Price 6d.

3,458. D. Emptage, Margate. Syphon traps.

These traps are of a modified S form, placed horizontally with the outlet branch, curved outwards from the top bend. (Pro. Pro.) August 17, 1881. Price 2d.

3,467. O. Wolff, Dresden. Manufacturing weather-proof paint or varnish.

This paint is made by adding silicates, which have been calcined, to the oil colour. (Com. by E. R. Berger, Bismarck, Dresden.) August 19, 1881. Price 2d.

3,492. W. Taylor, Birmingham. Manufacture of reflectors.

These are formed of metal, highly burnished, and afterwards plated with nickel, and finished. (Pro. Pro.) August 12, 1881. Price 2d.

3,494. J. D. Richards and J. Fairhurst, Sheffield. Supports or fastenings for curtains and rods.

Four brackets are used, which hold the top, bottom, and side rods of the blinds, which are attached to the rods by rings. (Pro. Pro.) August 12, 1881. Price 2d.

Published during the Week ending March 25, 1882.

3,935. S. Krakauer, London. Supporting and protecting persons outside buildings for window cleaning, &c.

The frame is attached to two uprights, which are secured between the window-sill and the architrave, and are clamped thereon. July 5, 1881. Price 6d.

3,516. T. E. Parker, London. Open fire-grates, stoves, &c.

At the bottom of the back of the fire-grate is an opening into a tapered chamber, which again opens by a narrow slit into the chimney. The plates of the chamber are perforated to allow the ingress of the gases and smoke. These are first drawn over the top of the back plate of the fireplace into a cavity between this and the chimney, where they are superheated, and then pass through the perforations into the tapered chamber, thence into an inverted cone at the base of the chimney, where they are consumed. July 20, 1881. Price 6d.

3,271. A. McLaren, London. Glasses or lenses for pavement and other lights.

These lenses have a rounded front face and a rounded bottom edge, instead of the usual plane surfaces. July 28, 1881. Price 4d.

3,451. E. Lee, Torquay, and A. C. Moore, Deptford. Apparatus for regulating the supply of water and other liquids to water-closets, &c.

The discharge-pipe reaches up above the level of the water in the tank. Surrounding this pipe is an annular passage having openings near the bottom into the tank. Surrounding the upper part of this is a fixed cylindrical displacer, the upper edge of which is attached to the edge of the annular passage, and carries an annular plate extending over the passage. Enclosing all is a hood, the bottom whereof fits loosely round the lower part of the annular passage. When this is lifted the water within is made by the displacer to flow over the plate into the discharge-pipe, and sets up a syphon action. August 9, 1881. Price 6d.

3,523. W. Brierley, Halifax. Venetian blinds.

The bands which pass through the laths are made round an arbor. By pulling a cord wound also round the arbor, but in the opposite direction, the latter are raised. The arbor is surrounded by a hollow cover, encircling on pivots, which is concentric to the arbor. Bands are passed over this, which support the latter, and whereby they can be held at any required angle. (Com. by F. Kühr, Teplitz, Austria.) August 13, 1881. Price 6d.

3,535. T. C. Johnson, Gravesend. Manufacture of Portland cement.

The imperfectly-mixed washed chalk and clay, as it comes from the harrow mill, is submitted to a rapid agitation in a churn-like tower or agitator, which has rapidly revolving vertical arms or knives. August 15, 1881. Price 4d.

3,577. G. Butler, G. Skuddert, and H. Fabian, London. Machine for sifting cement, &c.

The material is conducted to one end of a sieve having a reciprocating motion, and worms traverse the length of the sieve moving the material about. (Pro. Pro.) August 17, 1881. Price 2d.

3,629. C. Drake, London. Baths.

These are constructed of a concrete, made of marble or granite chippings and Portland cement. August 23, 1881. Price 2d.

3,630. C. Drake, London. Facing bricks.

The body of the brick is formed of a common cement concrete. The faces are composed of a concrete made of small pieces of marble or granite and Portland cement. August 23, 1881. Price 2d.

#### THE SOANE MEDALLION AWARD.

SIR,—You properly pointed out the serious error made by the Council of the Institute of British Architects in awarding the Soane medallion offered for the best design for a West End Club-house, child of the nineteenth century, to a rude, impossible, turreted structure, supposed to represent the work of the Middle Ages. But you were too mealy-mouthed on the occasion. The opinion of every sensible person to whom I have spoken on the subject is, that the council have done a great deal of mischief by encouraging the production of such needless rubbish. They endeavored to exonerate themselves by their report, but failed utterly. If this is the direction the Council wish to give nineteenth-century architecture, the sooner it is fully understood the better. Something should at once be done to remove the evil impression produced among the young men by this foolish award. It has struck common-sense dumb. M. A.

#### THE PARKES MUSEUM OF HYGIENE: A COMPLAINT.

SIR,—Wishing to make a small sanitary improvement in my house, I desired, before seeing the plumber, to get a little practical information on the subject, and for that purpose went at some little inconvenience last Monday afternoon to the Parkes Museum. There I found that it was only open on Tuesdays, Thursdays, and Saturdays, and then only from ten to two o'clock. Unless the managers of the museum can give some very strong reason for this arrangement I can only say that it is very bad management. Sanitary reformers are always saying that if we householders would only take a little trouble, and make ourselves practically acquainted with the rudiments of sanitary arrangements, we should not require so much teaching from them; and, by way of assisting us, they open a museum only for three days a week at the most inconvenient hours to business men and working men. Of all times in the week at which it might have been supposed the museum would be open, viz., Saturday afternoon, it is closed, and yet it is open in the morning, which is just the morning of all others on which business men and working men do not leave their work. Therefore, it appears to me that the managers of the museum have reduced its public benefits to the smallest possible minimum. I trust that some influential sanitary reformer, who may be about to read a paper on the subject of traps or ventilators, will, instead, set to work to reform the arrangements of the Parkes Museum, whereby we who desire it may thus improve our practical knowledge of sanitary matters. A HOUSEHOLDER.

#### "GENERAL FOREMAN"

SIR,—I was looking over my *Builder* of the 25th ult., and came across a letter signed "T. M.," being "a word to master builders for a practical man of considerable experience," and decrying the practice of appointing general foremen over jobs.

"T. M." says there is not a man to be found fit to fill such an appointment, because there is not one living who is practical in all the branches of the building trade. This is a poor reason for dispensing with the general foreman. I do not know in what branch "T. M." is practical; I may say, for instance, a carpenter and joiner, or granted that he is a practical man of experience, I would ask him if he could not tell a piece of bad plastering, plumbing, &c., either during execution or after? If he could not, then I am afraid he has had no eyes but for his own bene during all the years of his experience.

As a rule, general foremen are selected from the ranks of carpenters and joiners, and an intelligent man of this kind must, in the course of years of experience, gain a most extensive knowledge of not only his own trade, but of others, from the very fact of his own work coming in contact with that of the other trades, and a desire on his part to gain a knowledge of the latter, which is, or ought to be, in the mind of all aspirants to being foremen, whether general or otherwise; and I know of general foremen whose knowledge of the various trades



has been granted by judges to be perfect: though they might not be able to lay bricks, make a solder joint, or run a cornice, still they know how it is and ought to be done.

Architects, for instance (and, I would add, many clerks of works), are not practical, yet how few of these there are who cannot tell when work is being badly done, or tell how it ought to be done properly?

I should say the very fact that it is the practice of master builders to place a good general foreman over a job is sufficient proof that it is to their interests to do so, and the master whom I am under (one of the largest in the trade in London) is perfectly sure of it.

BUTTY.

#### PORTLAND STONE.

SIR,—I have seen in the *Builder* a letter from "G. R.," and one in last week's *Builder* in answer to it, on the decay of stone in London buildings. For the last thirty years I have been chiefly employed among Portland stone, and my experience leads me to the same view as Mr. Henry Travis. He says the stone is very porous and absorbs moisture, and I would add the more of it and the easier it absorbs the sooner the decay. A survey of decayed Portland stone would reveal the fact that in nearly every case it is the softest specimen of it that can be found, with very open pores to allow the moisture freely to enter. The Portland stone most fit for the London buildings and to resist the pressure of the atmosphere is one of regular texture and firm in quality, such as that to be seen in the recent Building Exhibition (Stand 157a). Each of the buildings spoken of by "G. R." is well known to be of this quality. The stone used for the new Post Office, St. Martin's-le-Grand, and that used for St. Stephen's Club, Westminster Bridge, will both testify to the fact that there is still good Portland stone if selected with a view to its durability and not its cost. If to save 15 to 20 per cent. on the labour the builder uses the softest stone, the inevitable result will be a quick decay.

H. M.

#### SURVEYORS' CHARGES.

HUNT V. TUBBS AND LEWIS.

THE Arbitrator, Mr. Geo. Pownall, has published his award in this reference, which has been heard before him at several sittings during the last month.

The plaintiff, a surveyor practising at Queen Anne's-gate, Westminster, S.W., sued the defendants, the building owners of the Manchester Hotel, Aldersgate-street, E.C., for 902*s.* balance of an account for 1,253*s.* for measuring and valuing the additions to and omissions from the contract for building the hotel. The defendants pleaded that the greater part of the measurements were unnecessary, that plaintiff had been paid 325*s.* more than was due to him for taking out the quantities for the hotel, and that he sought to recover from the plaintiff a balance alleged to have been overpaid to him.

The Arbitrator has awarded the plaintiff 933*s.*, including interest to October last, and has ordered the defendants to pay the costs of the action, reference, and award.

Mr. Tyrrell T. Paine, instructed by Messrs. Paines, Layton, & Pollock, appeared for the plaintiff. Mr. Bagnave Deane, instructed by Messrs. Chapple, Welch, & Chapple, appeared for the defendants.

This case is specially illustrative of the unsatisfactory working of the rules of procedure in the Common Law Courts. The plaintiff having justified the details of measurements contained in 700 pages of accounts, his solicitors applied to a Master of the Court to direct the cause to be referred to arbitration. The Master said such application must be made to a Judge in chambers. On application to the Lord Chief Justice sitting in chambers, he order reference, but in consideration of the great length of the particulars, he allowed the defendants a month's time to decide upon the course they would take. At the end of the month, the defendants, refusing to refer the case, came before Mr. Justice Bowen, who confirmed the order of Lord Coleridge. The defendants then appealed to a Divisional Court, who confirmed the order of the Judges; and the defendants then further appealed to the Court of Appeal, who again ordered reference. The solicitors then agreed to Mr. Pownall as arbitrator, and he has made his award as before stated.

**Institution of Civil Engineers of Ireland.** A general meeting of the Institution was held at the Museum-buildings, Trinity College, Dublin, on Wednesday evening, the 5th of April, 1882, when a paper by Mr. Martin Atcock, member, on "Tubing of Locomotive Boilers," was read.

#### THE COMPETITION QUESTION.

SIR,—I think it is due to the high regard I feel for the *Builder* that I should ask leave to explain in a few words what position I have really taken up in this interminable business, upon which, otherwise, your mention of my name last week may occasion a little misunderstanding. I have never said that the new or double design system is not superior in moral intention to the old. I only think it will be found no better in respect of ruinous cost. A competitor will "go in to win" upon the same principle as before,—the principle well known in trade, that to make money you must lay out money. In producing "sketches," therefore, this representative of enterprise, straining as he did every nerve before, will strain every nerve now, whether in personal labour or in cash outlay. Tradition tells of the late estimable Mr. Moffatt that he would drive up to the board-room of a set of country Poor-Law guardians, with a competition design for their beggarly workhouse, actually in a post-chaise and four! What was the consequence? Mr. Moffatt won. Are there no Moffatts now? Are the resources of art no longer capable of Moffatt-ising a competition? You are shocked, most righteously shocked, at the idea of a competitor spending (in cash) 200*l.* on his Glasgow sketches. *O sancta simplicitas!* You say, "he was a very unwise person." I fear the children of this generation are still a little wiser than the children of light. Let us suppose, for the sake of argument,—it may be the case,—that he is one (possibly two or three) of the selected ten. Let us suppose,—it may be the case,—that he will come out No. 1 of all; or even No. 2, with No. 1 set aside as incompetent under the prudent stipulation of the Town Council. Will you call him unwise then? Nor is this all. Who is to be the King Canute of the rising tide of sketch-draughtmanship to proclaim, "Thus far shalt thou come and no further"? I say, as the Leeds men say, that not even the iron rod of Mr. Barry will be able to prevent earnest competitors from doubling their labour on the double drawings; and it is not even pretended that the *douceur* which is to be paid to a selected man for the second set is to go any farther than "towards" the cash expenses of that set; his first set, and every body else's first set, taking absolutely nothing. What have the 130 or 140 sets of Glasgow sketches cost the profession in cash? What is to pay the competitors for this outlay? Is it any consolation that one of them gets a silk purse, when all the rest of the 130 or 140 are left with only their *sews* (or *sews*) care? This is dreadfully worldly, and a little vulgar; but is it true? Again, I venture to say that no professional rule can ever alter the common law of this country, under which a client cannot have an agent forced upon him against his will, competition or no competition. What I therefore contend for,—and I have done so for many years with unvarying consistency,—is that all the competitors ought to be paid. This done, let the client who has thus purchased the right to do as he pleases do as he pleases, as he certainly will in any case, if the experience of half a century be worth anything at all.

ROBERT KERR.

#### VENTILATION OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—In a letter from Mr. John P. Seddon, published in your last issue, in which that gentleman attacks our system of ventilation as applied to the London Custom House, we observe that he makes the following statements:—"While I was honorary secretary of the Royal Institute of British Architects I helped to give Messrs. Boyle the opportunity to ventilate *at great cost* [the italics are mine] the meeting-room in Conduit-street, and after several years of painful endurance on the part of the members, *all those appliances were removed* [the italics are ours] and another system adopted." We now beg to say that Mr. Seddon's statements respecting the council-chamber of the Royal Institute of British Architects are as incorrect as those made by him regarding the Long Room at the Custom House, and which we will proceed to show.

With regard to helping us to apply our system to the council-chamber, it is possible that this may be true; but, so far as we are concerned, the name of Seddon was unknown to us until we, some half a dozen years ago, heard of it in connection with a rival system of ventilation. What does Mr. Seddon consider "great cost"? We see from your columns that the ventilation of the Board-room of the London School Board cost over 600*l.* Now, if for a room of that size the cost was so much, 1,000*l.*

would surely not be an unreasonable sum to put down for such an important building as the council-chamber of the Royal Institute of British Architects? At least, a sum of some such magnitude is what, as it impresses us, Mr. Seddon meant your readers to infer the application of our system cost. Does Mr. Seddon really know what the cost was? Would he be surprised to hear that the cost of the ventilating appliances supplied by us to the council-chamber was somewhere about 12*l.*, and that the system he speaks of was only a 30-in. air-pump ventilator, and that one of our very first pattern long since discarded by us in favour of more improved forms? Would Mr. Seddon also let us know what "all those appliances" consisted of which "were removed"? As far as our recollection serves us, we supplied nothing but the ventilator above mentioned, which was put in to assist in removing the heat from the gas, and which it did to a considerable extent, making the place more comfortable than it was before,—at least, so Mr. Eastlake, secretary to the Royal Institute of British Architects, assured the late Mr. Robert Boyle, at the same time informing him that he would be glad to give his opinion of the improvement effected to any one he might choose to refer to him. With respect to the "several years' painful endurance of the members," no one should know better than Mr. Seddon himself that the defect lay in the extremely low ceiling of the chamber, and we feel assured that every architect who may have had the misfortune to occupy it at any time before it was altered, and who may read these lines, will bear us out in this, and also in our opinion that no system of ventilation known at that time would have, in consequence of the chamber's structural defects, satisfactorily ventilated it.

ROBERT BOYLE & SON.

#### SKILLED WORKMEN.

SIR,—In your recent issues much has been said as to the above, but no writer seems to me to give the exact answer.

As an apprentice, artisan, and builder, I will briefly state my experience. Twenty-five years since there were good workmen working by my side. There are good workmen now, but, I am sorry to admit, the inferior overwhelm the superior. The answer that is required is,—the cause of this.

About eighteen years since I had contracts under the four or five architects, one of whom was inclined to find fault with the slow progress of the work. I told him I had great difficulty in getting men. His reply was, "The demand is greater than the supply. Take as many men as you can into the trade from the plough-tail, or any other place you can get them from. The day will come when the table will turn." I did this, and during this time perhaps 500 men who have worked under me have got a smattering of this or that trade. I must give the men credit for their forethought in banding together. Not so the masters. As, for example, if there should be an open contract, no matter how small, town or country, masters are all anxious to have it. They do not band together. On the other hand, the men are to blame, as, after a master has made his calculation, obtained a contract, got his men and machinery in good working order, the men come down upon him, and want 15 to 20 per cent. more for their labour. This is not justice,—to wit, the Law Courts. To come to the point, this is the cause of foreign-manufactured doors and other joiners' work being introduced into this country, also the cause of foreign artisans being brought here.

A word about unionism. The men are not to blame for banding together, but they are to blame for putting all men on an equality. "Joiner" says the men are tested before being admitted. How easy it is for one man to propose a fellow-workman at any lodge one week, and the next week he is admitted as a member of their lodge as an experienced mechanic, and perhaps not more than two of the whole members of that lodge ever saw the man before.

I will not take up more of your valuable space on this occasion, but conclude with, "Pay every man according to his capabilities."

BENN. INKPEN, Builder.

#### FOG IN REGENT'S PARK.

SIR,—During the time the Regent's Park was being drained, I frequently passed through it, and if my memory serves me correctly, the drain pipes were 4 in. in diameter, of somewhat impervious material, laid in trenches about 8 ft. deep, and about 13 ft. apart. My impression at the time was that, for such a soil, the mode of drainage carried out would prove a failure, and such is the case. I would suggest that smaller and more porous drain-pipes should be put in at a less depth, and much closer together. The existing drain-pipes might be found useful for carrying off the water from the proposed pipes by connecting them at intervals, and it would be desirable to put some well-burnt clay ballast over the proposed drain-pipes.

Some of our suburban commons also are much in need of attention as regards drainage.

A READER.



## ON THE SEASONING OF WOOD.

Sir,—Referring to the article on the above subject in your issue of the 11th ult. (p. 280), we concur generally with the writer, but perhaps a few remarks as to artificial drying or seasoning, which he scarcely touches on, may not be uninteresting to your readers.

In many cases where the artificial drying of timber has been attempted, it has failed through subjecting the timber to too great a heat, and without the means of carrying off the vapour, and the failures arising from this unscientific mode of treatment have caused a prejudice against any means of hastening the natural seasoning of wood.

The natural process of seasoning is most rapid in its operations whilst the dry winds of March prevail, and this fact led Mr. K. Davison to invent a system for drying timber by means of currents of heated air, known as the desiccating process, which has been in use now for years, and is found to answer perfectly well. The wood so dried is found not to crack so much as timber dried naturally under favourable conditions. It has also been found by numerous experiments that wood so treated is stronger.

"H. S." points out the advantage of keeping timber clean, so that the shorter the time occupied in rendering it ready for use the better, and, as he also says of Baltic white wood, as it "rapidly deteriorates under the action of the rain, the sun, and frost, the more quickly it is dried the better."

With regard to the more expensive woods, the advantage is still more obvious; for where a large stock of these woods has to be kept, a large amount of capital is lying idle. For instance, 1 in. mahogany boards require about two years under favourable conditions to dry naturally, whereas by our system they can be dried as effectually and soundly in from four to six weeks.

DAVISON, INSKIP, & MACKENZIE.

## Books.

*The Law relating to Building Leases and Building Contracts, the Improvement of Land by, and the Construction of Buildings.* By ALFRED EMDEN, Barrister-at-Law. London: Stevens & Haynes. 1882.

WHEN Mr. Emden mentions in his preface that, according to the recent census, there are in England and Wales 4,838,844 inhabited houses, 380,684 uninhabited houses, and 46,759 houses in course of erection, some idea is given of the large number of persons who are interested in the subject of building, and at one time or another want to know something of the law relating to building leases, contracts to build, and the construction of buildings. To supply this want is the writer's object in publishing this work, and we have no hesitation in expressing our opinion that it will be found valuable by several distinct classes of persons. In addition to the notion of its contents conveyed by the part of the title we have quoted at the head of this notice, Mr. Emden gives a full collection of precedents of agreements for building leases, contracts, mortgages, and other forms often required, as well as the Building Act, the Metropolitan Management Act, and other statutes, with notes and references to the latest cases under the various sections. He adds, too, a glossary of architectural and building terms. With regard to the references to cases throughout the work, we must give him credit for great industry and acumen. The Glossary, notwithstanding the author had the assistance of an architectural friend, shows, as glossaries usually do, how difficult it is to define; the insufficiency of the following, for example will be obvious to most of our readers:—"Acanthus. Foliage used in classic enrichments." "Flank Wall. A cross wall, or one at right angles to a party-wall." "Order. The combination of architectural features constituting a style." And so on. Moreover, the carcass of a house is not spelt "carcase." However, these are but trifles. It is a greater objection to say that some of the difficult points are avoided rather than discussed. For example, the question as to the ownership of plans prepared by architects is dismissed in eighteen lines. It might well have been discussed at some length. Still it seems to us a good and useful book, and we recommend the purchase of it without hesitation.

To show the manner in which the author treats subsidiary matters, and because of the information it contains, we quote the chapter headed,—

## Valuations of Land for Building, and Cost of Building.

The following remarks may be useful in assisting the reader to form a general idea as to the expenses of building; it is not intended that

they should do more than this. Few things are more fluctuating, and more difficult to estimate, than the value of property, and even of dwelling-houses, business premises, and the like; so much depending on situation, fashion, and a hundred other considerations which operate on the probable market value, and prevent the acceptance of any general rules or estimates. Almost every case has, in fact, to be considered *per se*. Land near thriving towns is always rising in price to a point far beyond its mere agricultural value. The formation of a railway raises the value of all the surrounding property; the discovery of minerals, the extension of old or the establishment of new industries, a succession of good or bad harvests, and such like causes, too many to mention here, affect the valuations of property. Freehold building land may vary in value from 30*l.* per square foot in the City of London to 150*l.* per acre in the vicinity of small market-towns, and in the outskirts of small towns about thirty miles from London, from 150*l.* to 250*l.* per acre. The value of good fertile agricultural land in the midlands may be assumed, at the present time, to range from 45*l.* to 75*l.* per acre.

Building land in the metropolis is now more often than otherwise obtained on lease. In the West End of London, fashionable building sites are, in some instances, let on long leases, say eighty or ninety-nine years, at 5*l.* per foot of frontage 120 ft. deep; equivalent to 150*l.* a year ground-rent for a frontage of 30 ft. A ground-rent of 1*l.* per foot frontage is by no means an unusual one in the smaller London squares. The ground-rent may vary from one-quarter to one-tenth of the gross house-rent. It is almost impossible to lay down any general rules for the guidance of those who may buy land for the creation of ground-rents. The following calculation will give a general idea as to the proportions of the various outgoings connected with the laying out and development of a large building estate:—

Cost of 100 acres at 1,000 <i>l.</i> per acre .....	£100,000
Add expense of fencing, the formation of roads, sewers, &c., with surveyor's fees and legal and other charges .....	22,500
.....	£122,500
Add interest, during creation of ground-rent, on total capital and outlay, seven years at 5 per cent. per annum .....	43,875
Total .....	£166,375
Deduct amount recoverable from the purchasers for roads and sewers .....	17,500
Total cost of development .....	£148,875
It may be assumed that deductions, for roads, church, and space not available for building plots, would amount to 25 acres, leaving about 75 acres, or say 1,650 plots of 20 ft. by 100 ft. These plots of 20 ft. frontage would be worth 7 <i>l.</i> 10 <i>s.</i> per annum rent, or at 25 years' purchase to pay 5 per cent, the 1,650 plots would sell for	309,375
Balance of profit .....	£161,000

If we allow for the management and office expenses of the property 2,000*l.* per annum, a fair charge, for seven years .....

We have a total estimated profit of about.....£147,800

The cost of buildings varies greatly according to their intended use and the style of the finishings adopted, and may range from 4*l.* to 2*s.* 6*d.* per cubic foot. The plan of "cubing," as it is termed, furnishes a rough estimate of the cost, when the price of a similar class or description of building is known. By cubing is implied the calculation of the cubic contents, of the height, from the bottom\* of the footings to half-way up the slope of the roof, multiplied into the total area of ground covered by the structure. For dwelling-houses, and public buildings of a distinct character, this mode of valuation is tolerably exact. Town mansions of the first class will cost from 10*l.* to 1*s.* 3*d.* per foot cube, according to decorative finish; second-rate town houses, 7*d.* to 1*s.*; third-rate ditto, 6*d.* to 9*d.*; fourth-rate, and artisan dwellings, from 4*d.* to 6*d.* per foot cube.

Dwelling-houses are sometimes estimated at so much per room, which may vary from 30*l.* to 150*l.* in buildings of different classes. The plan of "cubing" is, however, the most reliable. Country work is from 15 to 20 per cent. cheaper than London work, but in the large provincial towns the price of building does not vary materially from that in the metropolis. Ten per cent. less would be the extreme limit of difference.

The price of schools and churches is generally estimated at per place, or per sitting. The Board schools cost from 7*l.* 10*s.* to 8*l.* per place.

\* In some recent Government instructions the "top" of the footings is mentioned, but this is not the usual practice.

Small country schools with not much decorative work will cost from 6*l.* to 8*l.* per scholar. Churches, exclusive of tower and spire, will average from 6*l.* to 7*l.* per sitting; or about 10*l.* complete. Large and highly decorative churches from 12*l.* to 15*l.* per sitting.

Aylms, infirmaries, and workhouses will cost from 50*l.* to 120*l.* per inmate; but a modern hospital with decorative exterior may cost more than double the above sum. Thus the new St. Thomas's Hospital cost 250*l.* per bed. Warehouses with fire-proof floors may cost from 8*l.* to 10*l.* per foot cube, if solidly built with decorative fronts. London shops, 7*d.* to 11*d.* per cubic foot, and chambers and offices in the City from 8*d.* to 1*s.* per foot cube. Where there are large cellars and areas it is better to deduct them from the main block, and to price them separately at a lower figure, say 6*d.* to 7*d.* per foot cube. Very large open spaces, such as courts with glazed roofs, of the nature of markets, railway stations, &c., will cost from 3*d.* to 7*d.* per cubic foot. Stabling, with coach house and lofts complete, may cost from 60*l.* to 90*l.* per stall. Another rough plan of arriving at an idea of the value is to take four times the cost of the brickwork, for building of a general character. Many builders adopt this rapid plan of obtaining an idea of the cost of the work. From twice to two and a half times the cost of the carcass is usually taken as an estimate of the expense for the completion of houses of the cheaper class.

A recent author, taking 533 persons per house (the number given in the 1871 census), and estimating the average value of a house throughout the country at 250*l.*, assumes that 50*l.* per house is the approximate cost for housing each inhabitant of England and Wales. This appears to be too high, as 200*l.* would be a sufficient average value for the dwellings throughout the country or 40*l.* per head.

Rentals depend upon considerations almost as various as the value of the land itself. Houses on a repairing lease should pay at least 6 per cent. on capital; ground-rents 4 per cent. weekly property often pays 10 to 15 per cent. Artisan dwellings pay 5 per cent., and ground shop property 5 per cent. A rent of as much as 10*s.* per superficial foot per annum on the ground floor, and from 7*s.* to 8*s.* on the first floor, is paid in the vicinity of the Bank. Shops pay an extravagant rental also if in first-class position: from 750*l.* to 1,000*l.* per annum in Queen Victoria street, and from 350*l.* to 500*l.* in Regent-street. The rent of some of the shops under the Grosvenor Hotel, Northumberland-avenue, was fixed at 700*l.* per annum.

## Miscellaneous.

**A New Feature in Exeter.**—A new structure is about to be erected at the bottom of Longbrook-street, as a studio and business premises, by Mr. Harry Hems, of this city. The plans have been designed by Mr. R. Medford, F.R.I.B.A., and are in the now fashionable style. The front, facing Longbrook-street, is three-storied, buttressed at the sides, and finishing with a Dutch gable. This facade, like the rest of the erection, will be built in washed coloured bricks, while the stone dressings and match will be in red Dumfriesshire stones. The central lower shaft upon the ground-floor is detached one of polished Aberdeen granite, rising upon a grey granite base, carrying a moulded capital and tablet of the same material. Upon the shield on the tablet will be a horse-shoe, with the incised inscription:—"Ye Ironie Horse-shoe December 4th, 1866." This refers to the date of the finding of the horse-shoe by the owner. Immediately above, upon a moulded corbel, beneath a canopied niche, will be a piece of sculpture. The various windows will be filled with stained glass. The side elevations are three-storied rows of workshops and studios between 100 ft. and 200 ft. long, buttressed intervals, with the ground-floor arched, and of upon one side. The chimney-stacks are in good features. The roofs will be of high pitch and covered with strawberry-tinted Breck tiles, and surmounted by a red ridge. In rear of this range of buildings will be dry sheds for timber and other materials incidental to the carrying on of Mr. Hems's vocation. The contract for the erection of the carcass of the main building has been undertaken by Mr. J. B. Gibbard, builder, of Old Tiverton-road, Exeter.



**Surreptitious Portrait-taking.**—We hear from both America and Paris of an apparatus, in the form of an opera-glass, that can be converted in a few minutes into a photographic apparatus. It consists of a dry plate outfit, adapted to an opera-glass case. A matched pair of lenses (one having an instantaneous shutter) are quickly substituted in place of the usual eye-pieces of the opera or field-glass. The object glass of one tube is replaced by a plate of ground glass for focussing on, while in place of the object glass of the other tube a dry plate-holder is easily attached. These changes have turned the opera-glass into a photographic apparatus. It can then be directed towards the person or object to be photographed, and when the image is properly focussed on the ground glass the shutter on the other tube is sprung, and the picture is taken. A rolling spring screen then covers the sensitive plate, and it is transferred to the "dark chamber." This consists of a cylinder of black cloth, like a muff, into which the hands can be inserted, and which fits tightly about the wrists by means of elastic bands at both ends. In this the plate is removed and wrapped up, and another plate inserted in the holder for the next picture; the plate may be left until it can be conveniently developed at some future time. The apparatus is made by R. C. Arizard, Paris.

**Fall of a Gallery.**—A serious accident occurred at Plymouth on Saturday night, resulting in injuries to several persons and in a panic which at one time threatened to have still more disastrous results. During the performance at Hamilton's Diorama, and whilst the people were stamping in applause, a loud sound was heard, and immediately the front of the gallery cracked, and fell with a crash into the body of the hall, a distance of 20 ft., carrying with it some fifty persons, who were leaning against it. A scene of extraordinary excitement prevailed all through the hall, and a rush was made in the direction of the doors. The wreckage was cleared away, and it was then found that in the majority of cases the fall had stunned rather than bodily injured, but in some half a dozen instances scalp wounds, dislocations, and internal injuries were sustained. Examination of the gallery proved it was supported by planking, which it was thought was inadequate for the strain likely to be brought on it.

**Blast Furnace Slag.**—The utilization of this material is still a difficulty. Foreign investigators find objections to most of the ways in which it has been used, and add:—"The most practical and successful methods hitherto employed for turning slag to useful account, besides preventing its becoming a nuisance and an eyesore, is to make it into bricks and mortar for building purposes. By granulating it, and allowing it to fall into a stream of cold water, a sand is formed, which, with the addition of lime or gypsum, may be made into either bricks or mortar. The strength of bricks thus produced is greater than that of the best bricks of Burgundy, and their price on the spot is about 87 francs (11. 10s.) per thousand."

**New Dock.**—A Select Committee of the House of Commons have passed a Bill authorizing the East and West India Dock Company to construct a new deep-water dock at Tilbury, in immediate proximity to the London, Tilbury, and Southend Railway, with which the new dock will be connected by means of sidings. The proposed dock will have a depth of water of 12 ft. at the ordinary high-water spring tide, while at low water the depth will not be less than 26 ft. The dock will be constructed in the form which has been recently adopted by the Mersey Dock Board at Liverpool, involving the obtaining of the largest amount of lineal space with the smallest amount of water space.

**Glasgow Architectural Association.**—The annual meeting of the above association was held in the Bath Hotel on the 31st ult. Thirty-two members and friends sat down to dinner, Mr. Campbell Douglas, I.A., hon. president, in the chair. After the usual loyal toasts, the chairman proposed "The Glasgow Architectural Profession," which was acknowledged by Mr. John James Burnett in a few appropriate remarks. The toast of the evening, "The Glasgow Architectural Association" was then given from the chair, and responded to by Mr. Lawrie, the resident. The other toasts were the healths of Mr. John Honeyman, hon. ex-president, and the chairman.

**Royal Italian Opera-House, Covent Garden.**—The programme which has been issued for the new season, commencing on the 15th inst., includes a list of artists which must be pronounced exceptionally strong, especially as regards the ladies. Such a trio as Madame Patti, Madame Albani, and Madame Pauline Lucca, too long absent, can scarcely be matched. Several new operas will be produced during the season. A company is in course of formation for the purpose of purchasing existing interests in the Royal Italian Opera-House and Her Majesty's Theatre, and is, we believe, taking satisfactory shape. The amount of capital sought for has been wisely lessened from that first asked for, and would seem to offer fair prospects to investors.

**Cantor Lectures, Society of Arts.**—The fourth and concluding lecture of the course on "Hydraulic Machinery" was delivered by Professor John Perry on the 27th ult. The lecturer began with a description of lifts, and of the new balance method as applied to bridges, canal boats, and other lifts. He then dealt with the question of the transmission of power to machines, and its application to various tools, concluding with a comparison of hydraulic and electrical methods, and the part which each is likely to play in the future. The lecture was illustrated by models and a large number of diagrams.

**Temple Bar.**—Mr. Horace Jones, the City Architect, has been instructed to prepare plans for an obelisk out of the materials of old Temple Bar, to be erected in Epping Forest. The precise locality has not yet been fixed upon, but it will probably be the spot which will be made most memorable by the visit of her Majesty to the Forest next month.—City Press.

**Reading.**—The memorial to the 66th (Berkshire) Regiment is to take the form of a painted window in St. Mary's Church, Reading, where the old colours of the 66th hang, the subject being Johnnie and the host. It has also been decided to erect a monument in the shape of a colossal lion in the Forebury Gardens.

**New Schools.**—to accommodate 400 boys, are about to be erected in Vincent-square, Westminster, for the Townsend Trustees. Mr. H. H. Bridgman is the architect.

**The Polytechnic Institute, Regent-street,** is to be converted into a Young Men's Christian Institute, for Mr. Quintin Hogg.

## TENDERS

For re-building premises, exclusive of sub-basement, No. 4, Lawrence-street, Cheshire, for Mr. E. S. Marriott. Mr. G. A. Bannage and Messrs. Harvey & Protheroe, joint architects. Quantities supplied by Messrs. J. & A. E. Bull:—

	£	s	d	Time.
Rider & Son	23,223	0	0	6 months.
Nixon	3,213	0	0	"
Mortimer	3,120	0	0	"
Macey & Sons	3,113	0	0	4 months.
Adamson & Sons	3,101	0	4	"
Ashby Bros.	3,014	0	5	"
Byrington	2,987	0	5	"
Higgs & Hill	2,949	0	12	weeks.
E. Lawrence	2,939	0	14	"

For new roads and sewers, Womersley-road and Cecile Park-road, Womersley House Estate, Crouch-end. Messrs. E. E. Croucher & Co., surveyors:—

McKenzie, Williams, & Co.	22,788	0	0
J. Bell	2,697	0	0
J. Pizze	2,577	0	0
C. Killingback	2,550	0	0
T. Adams	2,500	0	0
T. G. Dunmore	2,338	0	0

For re-building the boundary-walls enclosing Charles Churchyard, Plymouth. Mr. Charles King, architect. Quantities supplied:—

H. Gill, Dorchester	21,099	0	0
T. H. Harley, Plymouth	1,044	0	0
Petrick Bros., Plymouth	944	0	0
Laphores & Good, Plymouth	889	0	0
A. R. Lebridge, Plymouth	893	0	0
J. Parsons, Plymouth	821	0	0
G. Shillbeer, Matley	767	0	0
F. Elworthy, Matley	740	0	0

For enlargements of District Board School, at Eastleigh, near Southampton, for the South Stoneham School Board. Mr. W. H. Mitchell, architect:—

H. J. Sanders	2,859	0	0
Brinton & Bosc	860	10	0
J. W. Rowland	820	18	0
J. Crook	819	10	0
Stevens & Sons (accepted)	772	0	0

For block of three residences for farm bailiff, gardener, and carter, at Thornhill Park, Bitterne, near Southampton, for Mr. F. Willan. Mr. W. H. Mitchell, architect:—

W. H. Chapman	21,218	0	0
Brinton & Bosc	1,158	0	0
Stevens & Sons	1,089	0	0
J. Dyer	1,050	0	0
J. Crook	1,037	0	0
D. Haines (accepted)	862	10	0

For additions and alterations to Maiden Erleigh, near Reading, for Colonel Hargreaves. Messrs. E. Salomons & R. Selden Wornum, architects. Quantities by Mr. Alfred Soxall:—

E. Lawrence	213,401	0	0
Holland & Hannen	13,030	0	0
Nightingale	12,850	0	0
Dove Bros.	11,850	0	0
Shepherd	10,904	0	0
Kinnimont & Sons (accepted)	10,743	0	0

For new premises in John-street, Clerkenwell, for Messrs. Pfeil, Stedall, & Co. Mr. J. Peacock, architect. Quantities by Messrs. Gardiner, Son, & Theobald:—

R. Coader	23,313	0	0
Brass	2,261	0	0
Croudin & Co.	2,204	0	0
Lawrance	2,185	0	0
Lathey Bros.	2,130	0	0
Grover	2,128	0	0

For two shops at High-road, Kilburn, for Mr. D. J. Pash. Mr. Walter Graves, architect:—

Spencer & Co.	21,655	0	0
Swain	1,629	0	0
Years & Co.	1,553	0	0
Hallett & Stewart	1,315	0	0
Slingson & Co.	1,313	0	0
W. Bech	1,235	0	0
Anderson	1,208	0	0
O. Demasford	1,170	0	0
Kelland	1,170	0	0
T. Niblett	1,147	0	0

For alterations and additions to the Grapes public-house, Milton-street, Cripplegate, Mr. Paterson, architect:—

Scrivenor	21,390	0	0
Edgley	1,275	0	0
Lawrence	1,275	0	0
Geo. Crabb	1,155	0	0
Williams (accepted)	1,130	0	0

For the erection of two warehouses in the Clerkenwell-road. Mr. G. W. Baker, architect:—

G. Crabb (accepted)	25,640	0	0
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For shop-fittings, Exchange-buildings, Renshaw-road, for Mr. Philip. Mr. J. W. Stevens, architect:—

Oxford	2,628	0	0
Summerville	473	0	0
Wake & Dean	463	0	0
W. Salter	249	10	0

For shop-fittings, High-street, Clapham, for Mr. Edwards. Mr. J. W. Stevens, architect:—

Oxford	2,197	0	0
Summerville	172	0	0
Wake & Dean	83	0	0
W. Salter	79	18	0

For St. Barnabas Mission Church, for the Auxiliary Committee of the Royal Association in Aid of the Deaf and Dumb. Mr. G. N. McIntyre North, architect:—

Mills	2,919	0	0
Joselyne	885	0	0
Woodward	805	0	0
Begley	803	0	0
Richardson Bros.	787	10	0

For the erection of a steam laundry, Cranbrook-road, Warple-road, Wimbledon, for Mr. C. S. Barton. Messrs. Ebbetts & Cobb, architects. Quantities supplied by Messrs. Hodgson & Mundy:—

H. Harmer (accepted)	22,149	13	5
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Froughton Taxis.

A. D. Dawney	289	8	0
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Concrete Paving.

The Eureka Company	56	6	0
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For alterations, fittings, and decorations for café restaurant, 49, Strand, for Messrs. Glasella (Carlo Gatti). Mr. H. H. Bridgman, architect:—

Somerville & Smith	2,899	0	0
Clearence	857	0	0
Toms	912	0	0
Richardson Bros. (accepted)	886	0	0

For infirmary, &c., at Epping. Mr. Edmund Egan, architect. Quantities supplied:—

	£	s	d	Total.
Lucas, Kensington	25,138	0	0	3,418 0 .. 8,553
Crooket, King's-road	5,072	0	0	2,970 0 .. 8,543
Knorr Julian & Co., St. George's-road, S.E.	5,298	0	0	2,195 0 .. 7,783
Bell, Wood-green	4,719	0	0	2,971 0 .. 7,739
Robson, Woodford	4,828	0	0	2,550 0 .. 7,379
Howell & Son, Bristol	4,600	0	0	2,435 0 .. 7,203
Nightingale, Lambeth	4,568	0	0	2,583 0 .. 7,161
Nichols, Harlow	4,579	0	0	2,578 0 .. 7,151
Wells, Woodford	4,913	0	0	2,230 0 .. 7,133
Wendley, Leicester	4,300	0	0	2,738 0 .. 7,033
Wood, Chelmsford	4,400	0	0	2,385 0 .. 6,985
Egan, Buckhurst-hill	4,300	0	0	2,342 0 .. 6,943
Jones, Gloucester	4,880	0	0	5,485 0 .. 8,785
Bentley, Waltham Abbey	4,115	0	0	2,435 0 .. 8,550
Ernest & Son, Colchester	4,119	0	0	2,379 0 .. 8,498
Beale, Battersea	4,278	0	0	2,192 0 .. 8,470
Gregar, Stratford	4,149	0	0	2,311 0 .. 8,460
Angood, Tullington Park	4,050	0	0	2,310 0 .. 8,360
H. Kinnelands, Halesdend	4,057	0	0	2,243 0 .. 8,329
Vigor, Poplar	4,133	0	0	2,246 0 .. 8,278
Glascock, Bishop Stortford (accepted)	3,863	10	0	2,175 10 .. 8,029

For alterations and additions to Raworth, Leyham, Suffolk, for Mr. John Musgrave. Mr. F. Evelyn Marris, architect:—

Wellam, Leyham	22,438	13	0
Saunders, Dedham	1,834	0	0
G. Lee, Colchester (accepted)	1,740	0	0
C. H. Oldridge, Colchester	1,724	0	0

For the erection of stables and greenhouses, South Norwood, for Mr. John Ayle. Mr. J. Randall, architect:—

T. Potterton, Balham	21,560	0	0
J. & C. Bowyer, Norwood	1,339	0	0
C. Wright, Norwood	1,238	0	0
G. Masters, Anerley	1,340	0	0
G. Amer, Catford	1,230	0	0



For new verandah, entrances, &c., at Guildwood-cottage, Guildford. Messrs. Peak, Lunn, & Peak, architects:—  
Stradwick, Guildford.....£143 0 0  
T. Swayne, Guildford.....136 10 0  
G. Smith, Guildford.....134 10 0  
Garnett & Mills, Guildford (accepted) 127 0 0

For covered yard, &c., Friary-street, Guildford. Messrs. Peak, Lunn, & Peak, architects:—  
T. E. Downes, Guildford.....£235 0 0  
Garnett & Mills, Guildford.....238 10 0  
Thos. Swayne, Guildford.....210 0 0  
G. & R. Smith, Guildford (accepted) 202 0 0

For enlarging shop and repairing roof, 74, High-street, Guildford, for Mr. B. Shillingford. Messrs. Peak, Lunn, & Peak, architects:—  
Garnett & Mills, Guildford.....£374 0 0  
Stradwick, Guildford.....332 15 0  
T. Swayne, Guildford.....320 0 0  
T. E. Downes, Guildford.....300 10 0  
G. & R. Smith, Guildford (accepted) 284 12 0

For 864 rods of oak palisade fencing and two gates, at the New Cemetery, Woodbridge, Guildford. Messrs. Peak, Lunn, & Peak, architects:—  
Pink, Milne, & Co., Aldershot.....£169 3 9 1  
Martin, Wells, & Co., Aldershot.....166 11 6  
Fitz-Gerald, Woking.....140 16 5 1  
Marshall, Godalming.....107 0 0  
Miles Bros., Guildford.....100 7 4  
Hebburn, Worpleston (accepted) 94 3 6 1

For alterations and additions to stables, &c., Park Village West. Mr. Arthur Vernon, architect. Quantities by Mr. W. L. Vernon:—  
Holland & Hannen.....£270 0 0  
Goodwin.....450 0 0  
Sharman (accepted) 375 0 0

For the erection of five shops, High-street, Islington, for Mr. F. C. Frye. Mr. Arthur Vernon, architect. Quantities by Mr. W. L. Vernon:—  
Rharman.....£7,320 0 0  
Hook.....7,305 0 0  
Perry & Co.....6,827 0 0  
Woodbridge.....6,665 0 0

For the erection of eleven artisans' dwellings, High-street, Islington. Mr. Arthur Vernon, architect. Quantities by Mr. W. L. Vernon:—  
Sharman.....£2,750 0 0  
Hook.....2,465 0 0  
Perry & Co.....2,309 0 0  
Woodbridge.....2,295 0 0

For new billiard-room, 3, Gloucester-terrace, Regent's Park. Mr. Arthur Vernon, architect. Quantities by Mr. W. L. Vernon:—  
Sharman.....£585 0 0  
Goodwin.....540 0 0  
Holland & Hannen.....505 0 0

For alterations and repairs to the Polytechnic, Regent-street, for Mr. Quinlan Hogg. Messrs. Chadwick, architects:—

Kirk & Randall.....£8,330 0 0  
Patriot.....9,145 0 0  
Howard & Durrell.....8,074 0 0  
Macey.....7,737 0 0  
Lawrence.....7,640 0 0  
Langmead & Way.....7,300 0 0

For the erection of dining and recreation rooms, Colchester, for Mr. W. C. Aberdeen. Mr. J. F. Goody, architect:—

W. Borel.....£631 0 0  
W. Pitt.....610 0 0  
F. Dupont.....470 0 0  
G. Dolson.....469 0 0  
E. Ede.....460 0 0  
C. H. Oldridge (accepted) 419 0 0

For additions to St. Mark's School Chapel, Windsor. Mr. Stephen M. Wyborn, architect:—  
G. Revall.....£390 0 0  
J. L. Hollis.....382 0 0  
J. Willis.....337 0 0  
W. P. Revall.....323 0 0

For laying footways with Lummer Rock Asphalt, for the Corporation of Reading. Mr. A. W. Parry, surveyor:—  
Bradshaw & Co., Queen Victoria-street (accepted).

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# The Builder.

VOL. XLIII. No. 2045.

SATURDAY, APRIL 15, 1893.

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### As to the Future of Electric Railways.

HE application of electricity to locomotion is a subject on the exhaustive knowledge of which so much of the future welfare of the human race depends, that it is desirable to refer to those statements by Professor Ayrton on the subject, some of which are to be found in our columns (*ante*, p. 384). Nor is our object in thus doing so much either to support or to combat the opinions of the lecturer, as to bring forward some of those considerations which the practical knowledge of our railway system from its very cradle have rendered more familiar to the engineer than to the electrician.

Professor Ayrton has not omitted to point out that the work done in the moving of the locomotive engines forms a very serious part of the whole work done by our railways. This, no doubt, is so; and that it is so to a greater extent than has been as yet estimated will be seen by what we have to remark.

That the engines on the railways of the United Kingdom travel a much longer distance than the 222 millions of train miles of which the Board of Trade returns yield as the sum, there is, of course, no doubt. In some of the accounts of the companies, the mileage of engines is, or rather was, returned as a separate item from the train mileage; but we find no information on this score in the "Railway Returns" or in the "Index to our Railway System" at present. We are, however, in possession of two sources of information on this subject, to which it may be of service now to direct attention. One of these is the Report on the Railways of New South Wales, which, as published at Sydney, is not by any means so well known in this country as ought to be the case. The other is a series of elaborate tables of the working elements of the Richmond and Danville Railroad Company, which we owe to the courtesy of the general superintendent of that line.

On the New South Wales Railways in 1876 (the latest year for which we have the report at hand), the total number of engines and tenders was 101,—51 being for the passenger, and 50 for the goods traffic. The passenger engines weighed a little over 38 tons, and the goods engines a little over 49 tons each, the weight of the tender being included. The carriages forming the passenger stock weighed a little over

6 tons 1 cwt., on the average, and were 344 in number. The goods vehicles were 3,198, and weighed, on an average, 4 tons 16 cwt. The gross mileage of the engines in the year was 2,160,242 miles, of which 993,522 were run by the passenger engines.

The Government Commissioner for Railways in New South Wales in that year, Mr. John Rae, to whose conscientious appreciation of the duties of his position we owe the above data, has given us not only the materials for calculation, but the outcome of very minute computations. It is not necessary to add very much labour to the published tables to come to the following results.

For the passenger traffic on all the New South Wales lines, in the year 1876, the proportionate weights of engines, vehicles, and loads were:—

Engines.....	51.3
Vehicles.....	45.3
Loads.....	3.4

100

For the merchandise traffic, the corresponding proportions were:—

Engines.....	34.8
Vehicles.....	42.4
Loads.....	22.8

100

The value of statistical information of this kind becomes very great when we enter into such questions as that of the economy possible to be effected by electric power. From 35 to 51 per cent. of the gross work done on these railways consisted in moving the locomotives themselves. But, in addition to this, the disadvantage at which the locomotive works is shown by the difference of the formulae used to express the resistance to the carriage and to the entire train. For a train consisting of an engine and tender weighing 50 tons, and 100 tons of carriages, the total resistance, at thirty miles an hour on the level, is 3,000 lb. But the resistance to the carriages alone is only 1,328 lb. Thus, it is not only in the weight to be moved, but also in the mode of moving the weight, that the locomotive is so costly, that an economy of 56 per cent. would be secured by dispensing with its use. How much of the proportions of 45 and 42 per cent. of the gross load that is formed by the vehicles is due to the extra strength required for the resistance to locomotive energy, is not so obvious.

Turning now to the tables kindly furnished by Mr. T. M. R. Talcott, the general superintendent of the Richmond and Danville Railroad Company, we have somewhat different results, although the difference may probably be accounted for by the lower speed at which the traffic is usually carried on in the United States, as compared to that to which we are accustomed, and by the larger volume of

traffic. On the average of the three years, 1875, 1876, and 1877, the proportionate weights were as follow:—

For passenger traffic,—

Engines.....	32.80
Vehicles.....	61.63
Loads.....	5.67

100

For merchandise traffic,—

Engines.....	15.85
Vehicles.....	51.98
Loads.....	32.17

100

As the New South Wales lines are in an early stage of development, it may be considered that we have here two extreme cases, within the limits of which the proportionate weights will be found to range on different lines. Roughly averaging the above, we find that the weight of the locomotives is about 35 per cent., that of the vehicles 49 per cent., and that of the load 16 per cent. of the total weight moved.

On this view, as far as the mere question of the weight of the locomotive is regarded, it may be doubtful how far the loss of power by electric leakage will serve to counterbalance any economy effected by the abandonment of the engines. But the question of the diminution in the weight of the vehicles has to be borne in mind. As to that, we are not prepared at the present moment to offer a decided opinion. But there can be little doubt that the important item of capital outlay would be enormously reduced, both by the diminution in the strength of the permanent way and of the works of art that would be necessary to carry the traffic, if the heavy engines were abandoned, and in the much greater steepness of the inclines which it would be not only possible, but easy, to work, under those conditions.

We are, further, in possession of information derived from an experience which is now almost forgotten, but which bears very directly on this question. It is now some thirty-six years since Mr. Robert Stephenson designed the mode of working the Blackwall Railway by stationary power. Mechanically regarded, the plan was a success; and the financial result was also admirable. But a practical difficulty arose from the constant twisting and breaking of the rope. And what rendered this so formidable as to lead to the abandonment of the system was the fact, that on a fracture of the rope the whole traffic of the railway, on both lines, was brought to a standstill.

But the most interesting part of this experience is this. The cost per train mile was 1s. 6½d.; the trains, however, being much lighter than those which on the railways of the United Kingdom, now cost an average of 2s. 11d. per mile. Of this cost, however, by far the greater part was incurred in moving the machinery and the rope. Out of 324 indicated horse-power, it was found that 251 horse-power was thus expended; so



that only 63 horse-power, or under 20 per cent. of the whole, was employed in the direct traction of the vehicles and load.

The cost, notwithstanding, works out as low as 0.187d. per ton per mile, which we make to be 10 per cent. lower than the average cost of propelling a ton for a mile on the railways of the United Kingdom in 1879. But as the traction of the load and vehicles only absorbed 20 per cent. of this power, we get a cost, for that part of the duty alone, of 0.038d. per ton per mile, or less than one-fifth of the cost of the railway power of to-day. We do not insist too much on the accuracy of the comparison, because the cost now includes some 30 per cent. in the form of traffic expenses, which were not so heavy on the Blackwall line. Still, on the rough statement that, (1) stationary power is somewhat less costly than locomotive power, even under circumstances unfavourable for the former, and (2) that these circumstances may be so unfavourable as to increase the power required for the traction of load and vehicle alone from 63 to 324 horse-power, we think it is tolerably clear that any mode of using stationary power, which can draw a train, saving the weight of the engine, and applying its force in such a manner as not to lose more than 30 or 40 per cent. between the motor and the work, has an immeasurable future before it.

#### ITALIAN ACQUISITIONS AT THE SOUTH KENSINGTON MUSEUM.

If anything can compensate for the wholesale manner in which Italy is daily parting with its artistic treasures, allowing its great houses to be stripped, and its old towns rifled, it is to some extent to be found in the careful manner in which all these spoils are, by their appreciative purchasers, protected from the chance of future ill-treatment and neglect. Nowhere has the decorative art of Italy found a more congenial home than at the South Kensington Museum, which, in the quarter of a century of its existence, has gathered in this department alone a collection of works of art that must and does, not only astonish, but strike not a small degree of shame into the intelligent Italians who visit our national institution at South Kensington. Now that the organisation is gradually advancing, the Italian court forms a feature such as is without an equal in the museums of the world, reminding us, only in this respect, of the collection of the Museo Correr at Venice. No small credit is due to the directors for the zeal, not sufficiently recognised, which they have shown in attaining this result.

Within a few weeks fresh additions have been made to the Italian court in a number of most characteristic specimens of work chiefly of Venetian origin, and interesting as especially illustrative of the very decorative nature of the Italian art of the fifteenth and sixteenth centuries. These recent additions do not belong to the ordinary type of *bric-à-brac*, or easily portable objects such as is generally "picked up" during a journey in the Peninsula. They consist, in great part, of architectural details of buildings, from which they have been removed in the course of modern "improvements," as rife in Italy as elsewhere. It is not often that such finds can be made, and the museum authorities are to be congratulated on having acquired some very characteristic specimens.

The chief treasure may be said to be the very beautiful marble altar-front from the Gothic church of Sta. Chiara at Assisi, an actual portion, judging from the inscription, of the shrine of the saint, "the Lady" of Dante, who was the sister of St. Francis in his mission of mercy and charity in this world. The work is of the thirteenth century, untintured by the smallest trace of the Renaissance that was so soon to influence the art of Italy, and shown so well in the other new acquisitions surrounding this treasure. How it came from the church is merely explained by the fact that in the recent alterations and enrichments (?) of the shrine of the saint this choice specimen of Gothic work was removed. The church was built in the middle of the thirteenth century by Fra Filippo da Campiello, who, it will be remembered, was contemporaneously associated with the German Lapo or Jacopo d'Alemania, in building the two famous churches of St. Francis. Every one who has visited Assisi will recall the simple beautiful Church of Sta. Chiara, the frescoes by Giotto,

and the crypt which contains the remains of the noble founder of the order of the Clarisses, whose pure life of self-sacrifice was so fitting a counterpart to that of the founder of the barefooted Franciscans. To modern improvement we owe our possession of this relic of that Mediaeval period of fervent religious belief and pure-minded art.

Below this thirteenth century altar-front the museum shows a new acquisition in an Italian *cassone* of cypress-wood, not painted as such coffers usually are and were in the century after that to which this belongs (early fifteenth), but incised, the hollows being filled with coloured mastic; the decoration, as is often the case, consists of a series of figures in the richest costume, such as we may imagine the coffer was intended to hold when it was presented to the bride. From its age, its beauty, and condition, this acquisition is a rare addition to the collection. The small piece of Della Robbia ware hanging above is, of course, interesting; but the Museum possesses many more valuable specimens of an art which stood high among the decorative aids used by the Italian architects in the past, in "the good epoch," as they love to call it in Italy.

The sculptured tympanum of one of the doorways of the Abbey of the Misericordia at Venice, representing a colossal Virgin surrounded by attendant figures, is a most important acquisition. The work is said to be by Bartolommeo Bon, an artist of whom both Mr. Ruskin and the late Mr. W. Burges have told us not a little in connexion with the sculptured capitals of the Palace of the Doges on the Piazzetta side. The tympanum is, we believe, not exactly from the Abbey, but from the courtyard of the *albergo* or inn of the brethren of the Misericordia, which has recently been secularised, and handed over to the noble family, the founders in the Middle Ages of the charity. Their first duty has been to "sell up" the property. Reference was made not long since in these pages to this piece of vandalism, to which the South Kensington Museum authorities owe the possession of a very characteristic piece of fifteenth-century Venetian sculpture. The two sculptured brackets belonging to a circular fronted or hooded chimney-piece, also from Venice, are interesting as showing a type of fireplace of which there still exist specimens on the lagoons. The marble door with its architrave and cornice, which comes from Urbino, is a charming specimen of refined low-relief Renaissance decoration in its proportions, its mouldings, and the delicacy of the arabesques; its refinement finds a contrast in the high-relief piece of sculpture ascribed to Baccio della Porta, which is placed against the wall in the opening of the Urbino doorway.

The Museum authorities are to be congratulated on having secured two such characteristic works as the two Venetian well heads which have now been added to the Italian court. One of these is a *vera di posse* from Murano, of the tenth or eleventh century, square, its sides decorated with a conventional Byzantine pattern. The other specimen is such as is familiar to every one who has visited Venice; it bears, indeed, the traces of active use during its hard on 400 years of service, its edge worn into ridges by the bucket-chains ascending and descending. With its bold carving, lion's head, and foliage and blazoned stemma, of coat of arms, it is one of the most characteristic possessions of the Museum, and to every one who knows Italy it will awaken, in the quiet corner in which it now rests, far more than any other of the Italian treasures about it, recollections of the happy hours and brilliant scenes of a land which knows no fogs, but only Turnerian golden mists.

Equally characteristic of Venetia is the set of twelve carved balcony fronts which the authorities have added to the collection. They are the Vandals' spoils from an old palazzo, the Palazzo Pola, which, till within a few years, was one of the glories of Treviso; but a Government Office, in the approved modern style of florid Italian architecture, replaces the graceful imposing palace built by one of the Lombardi at the close of the active fifteenth century, when Venice was queen of the Adriatic and the tributary towns of the terra-firma, of which Mr. Freeman has lately told us so much, were populous and wealthy. Near the set of balcony-fronts, all of different Renaissance designs, and carved *à jour*,—somewhat different to our unsafe modern cast-iron abominations,—is a fine panel of orange-coloured Verona marble, another

fifteenth-century work rifled from a fine old palazzo.

The spirally-twisted marble column of Romanesque design,—seventh or eighth century,—is an interesting piece of work, and undoubtedly served as the pascal candlestick in some early Roman basilica. Among the new acquisitions there are two other spirally-twisted columns, also only fragments, but of later period to the Romanesque sculpture. They came originally, we are informed, from the *duomo* of Pisa, and are said to have formed part of a monument executed by Giovanni Pisano. The foliage and figures are certainly by no mean hand. The two columns are, indeed, excellent specimens of decorated architecture. They have, as a companion, a fifteenth-century sculptured pedestal of white marble and *verde antique*, which is suggestive of having served as a shaft to support a bust. The circular tie hanging above this pedestal is a very characteristic specimen of Italian decorative art. It is a piece of glazed terra-cotta ware, its ornamentation consisting of three swords, the speaking arms of the papal family of the Spada. Those who are familiar with the effect of the external use in Italy of glazed and coloured terra-cotta ware,—especially in the form of armorial bearings,—will recognise in the circular plaque a good specimen of a mode of decoration which might not und advantageously be revived, and of which the interior court-yard of the communal palace at Pistoja offers itself for the moment as an admirable example.

The authorities have also succeeded in securing a good specimen of a fifteenth-century tombstone, decorated in high relief with the quaintly-costumed figure of a juriscounsel: this relic comes from the neighbourhood of Bologna. From another university town, Padua, comes a new and interesting acquisition. It consists of a circular frame of Iatrin stone, enriched in low relief with delicate arabesques and representations of books, inkhorn, &c. With a minuteness customary with the artists of the early sixteenth century, the care devoted to the bindings is worthy of notice. A sculptured pilaster, probably the jamb of a large doorway, of latest fifteenth-century work, will interest students of Renaissance architectural decoration; while the marble tanks belonging to two Venetian lavatories of the early fifteenth century are choice specimens of a period when artists did not disdain to exercise their skill for the humblest purposes. Four terra-cotta bricks decorated with low reliefs, late fifteenth-century work, enter into the same category. Two marble statues of kneeling angels, holding candelabra, and which, we are informed, came probably from the chapel of the Strozzi Palace at Florence, are interesting pieces of late sixteenth-century work. A marble bull's head is essentially a "curiosity"; it originally formed part of the Altichiero Museum near Padua; the intention of the design,—a piece of seventeenth-century work,—being to show off a rare fossil, believed to be a petrified ox's brain. This treasure has been placed in a cavity at the top of the head of the sculptured ox. A bust in *gesso duro* of St. Jerome, ascribed to Torregiano, is not improbably the work of the sculptor of Henry VII.'s famous tomb in Westminster Abbey. There only remains now to mention a set of five marble panels inlaid with mosaics of porphyry and serpentine, very characteristic pieces of the so-called *pietra dura* work of the thirteenth century, which is to be found in the early churches of Rome and Tuscany, and of which we have a contemporary specimen in Edward the Confessor's Chapel in Westminster Abbey,—work done, it has been satisfactorily shown, by Italian hands. It is interesting and instructive to compare these mosaics of the thirteenth century with some specimens of almost exactly similar work, of Arabian origin (from Cairo), and belonging to the seventeenth century, to be found in another portion of the museum. It is by affording these means of comparison that the South Kensington Museum is doing such good work. The authorities have long since set aside the antiquated ideas of a museum necessarily consisting of odd and ends, and what is understood now-a-days, on both sides of the Atlantic, as *bric-à-brac* is important, and worthy of study at a time when so much attention is being directed to the subject of decorative art, and when the ever-changing weathercock of fashion is evidently veering round in the direction of that essentially decorative period known as the Renaissance.



## DECISIONS UNDER THE METROPOLITAN BUILDING ACTS.

The judicial exposition of the Metropolitan Building Acts is of so much importance to practitioners in the metropolis that we have considered that it would serve a useful purpose to give, in a concise form, the recent reported decisions on the subjects. As will be noticed, they are not numerous. No doubt others have been given, but not reported in the regular legal reports, and newspaper reports are not of any authority in the courts of law, so that it has not appeared desirable to mention any of them. We have taken cases which have been decided since the year 1876, as the second edition of Woolrych's "Metropolitan Building Acts" appeared in the beginning of 1877, and persons who are concerned with this subject have therefore the cases previously decided noted in that work.

*Knight v. Purcell*, 11 Law Reports, Chancery Division, 412; 48 Law Journal, Chancery Division 395 (1879).—The result of the case may be put in a few words. It touches on the Metropolitan Building Act, 1855, s. 3, and shows that a wall may be partly a party-wall and partly not such a wall. In this instance the wall was held to be a party-wall within the meaning of the above Act to such extent in height and width as the buildings on each side were co-terminous, such buildings being only a water-closet on one side and a wooden shed on the other.

*Scott v. Legg*, 2 Law Reports, Ex. D. (C. A.), 39; 46 Law Journal (Magistrates' Cases), 287 (1877).—This case turned on the construction of the Metropolitan Building Act, 1855, secs. 27 and 28. As to sec. 27, subsec. 4, it decided that an addition to an old building does not contravene the provisions of this subsection if together with the old building it contains more cubic feet than are allowed by this subsection. As regards sec. 28, subsec. 2, it decided that there must be two existing buildings to be united in order to call this subsection into operation, and that an addition to an old building was not a union within the subsection. It should be noted that Lord Bramwell states that "under some circumstances, a new building might be added to an old building in the course of its erection, if, in point of fact, the new part was a separate building intended to be used for a different purpose, and originally unconnected with the old. But the addition in this case cannot be called a new building."

*Parsons v. Tinswell*, 44 Justice of the Peace Reports, 298 (1880).—This case elucidates sections 45 and 46 of the Metropolitan Building Act, 1855, and shows that these sections can only apply to a building which is in the course of erection. A skating-rink having been allowed to be put up by a person under s. 56 of the above Act, with an undertaking by him that it should be removed within two years, it was not so removed, but it was held that the Metropolitan Board could not, under the above section, obtain an order for its removal, as it was not a building in the course of erection.

*Regina v. Lee*, 4 Law Reports, Q.B.D. 75; 48 Law Journal, Magistrates' Cases, 22 (1878).—This case arose out of sections 69, 71, 72, 73, and 74 of the Metropolitan Building Act, 1875. It decided that, although a church may be a building which under certain circumstances may be a dangerous structure within the meaning of the Act, yet that the incumbent of a district church, built under the Church Building Act (58 Geo. III., c. 45), is not the owner of the church within the meaning of the above sections of the Metropolitan Building Act, 1875. Consequently there is no power to recover from the incumbent of such a church the expenses of the work incurred in placing the church in a safe state.

*Dobson v. Metropolitan Board of Works*, 6 Law Reports, Queen's Bench, 112; 50 Law Journal, Magistrates' Cases, 29 (1880).—This case decides two important points in connexion with the Metropolitan Building Act, 1855, s. 73. 1. If the Metropolitan Board of Works have paid the sum claimed by them for making a dangerous structure safe, the magistrate is bound to make the desired order, although the sum paid by the Board for the work is a price in excess of that which would have been paid to a contractor at the ordinary rates of the day. 2. That the order may be made upon one of the owners of a party-wall only, leaving him to get his contribution from the other owner or owners under section 97, subsec. 2, if he can.

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*v. Stokes*, 4 Law Reports, Chancery Division, 200; 47 Law Journal, Chancery Division, 554 (1878).—The first point in respect to the Metropolitan Building Act, 1855, elucidated by this case is in regard to s. 83, subsec. 6, since it was decided that a party-wall might be raised underground as much as above ground. The second point decided was that when a difference has arisen which brings section 85, subsec. 7, of the Metropolitan Building Act, 1855, into operation, then, that until not only the appointment of the surveyors has been made, but until they have determined the right to do, and the time and manner of doing, the work, the building owner is not entitled to proceed with the work out of which the difference has arisen; and that if he does do so the adjoining owner has a right to go to the Chancery Division of the High Court, and obtain an injunction to prevent the building owner proceeding with the work until the award of the surveyors or umpire has been made.

*Ex parte McBryde*, 4 Law Reports, Chancery Division, 200; 46 Law Journal, Chancery Division, 153 (1876).—This case amplifies the Metropolitan Building Act, 1855, s. 85, subsec. 7, and practically incorporates with it section 12 of the Common Law Procedure Act, 1854. It decided that when one of the parties to a dispute arising out of the Act,—that is, either the building owner or the adjoining owner,—refuses to assist in selecting a third surveyor (each having previously nominated the surveyor to act for him), then that the High Court has authority, under s. 12 of the Common Law Procedure Act, 1854, to appoint a third arbitrator. The Court also has this power, even though there may be litigation pending as to a claim for light in connexion with the building in respect of which an arbitrating surveyor is to be appointed. Section 12 of the Common Law Procedure Act, 1854, so far as material to this question, is as follows:—"If in any case of arbitration where the parties or two arbitrators are at liberty to appoint an umpire or third arbitrator, such parties or arbitrators do not appoint an umpire or third arbitrator . . . and the documents authorising the reference do not show that it was intended such a vacancy should not be supplied, then in every such instance any party may serve the remaining parties to the arbitration, as the case may be, with a written notice to appoint an umpire or third arbitrator respectively, and if, within seven clear days after such notice shall have been served, no umpire or third arbitrator be appointed, it shall be lawful for any judge of the High Court, upon summons to be taken out by the party having served such notice as aforesaid, to appoint an umpire or third arbitrator, and such umpire or third arbitrator shall have the like power to act in the reference, and make an award, as if he had been appointed by the consent of all parties."

## THE GREEK TRIGLYPH.

It is not, perhaps, too much to assert that nearly all the difficulties that occur in accounting for the mode in which the Doric order was invented, will disappear when it is explained how the triglyph, which is its most characteristic feature, was first introduced, and for what purpose. As I have lately, in my researches into the mode in which light was introduced into Greek temples, hit on a solution which seems to me to account for all its peculiarities, I am desirous of submitting it to criticism, in the columns of the *Builder*, before using it in a more permanent form. But before doing this, I should like to make two or three remarks which will clear the ground for what follows.

Doctor Schliemann's recent excavations at Orchomenos have sufficed to settle, beyond all possibility of dispute, the age of his previous discoveries at Mycenæ. The roof of the inner chamber, or thalamos, there, was covered with a sculptured pattern of great beauty, but found nowhere else in Europe. On first sight, it looks like an Assyrian design, but the similarity vanishes on a close examination. Something like it is, however, found in Egypt, in paintings, which may be of a very early age.† It consists of four spirals arranged in a very peculiar manner,—difficult to describe,—at the four corners of a quadrilateral figure, and, with

the filling in, making a design of considerable complexity. Its special interest to us, however, lies in the fact, that the identical pattern is found in the so-called Limestone found by Dr. Schliemann at Mycenæ (figs. 140, 144, 145), and, what is more important, on the gold vessels (Mycenæ, figs. 341, 366, 472, 476, &c.), and the double honeycomb, if it may be so called, is found also at Mycenæ (fig. 151), and, in fact, the whole system of decoration at Mycenæ and Orchomenos is practically identical. This leaves no room for doubt that the treasures of Minyas at Orchomenos, the so-called one of Atreus at Mycenæ, and the tombs discovered in the citadel there, with their sculptured stones and gold and bronze ornaments, all belong to the same age, and that before the epoch generally known as the return of the Heracleids. We therefore now know for certainty, that long before the invention or introduction of the Doric order, the inhabitants of Greece were not only capable of extensive works in stone, but of ornamenting them with taste, and were also workers in gold and bronze on a very extensive scale, and we may therefore assume with safety that they were as skilled in their works in wood, though all these, from the nature of the material, have perished.

The next point is, that wherever we have any experience of a people adopting a lithic architecture in supercession to one of wood, they never copied rude wooden forms, but always the most perfect and complete carpentry models which had been invented or employed up to the date of transition. This at least was the case in India, in Persia, in Lycia, and now we know it was in Greece. In all these cases they copied in stone those forms which they had worked out, and which which they had long become so familiar as even to consider them as sacred. They only varied them to the extent that was necessary to express in stone those structural features which were hidden in the wooden construction, but which it was necessary to display in the stone work, in order that it might express clearly the form of the wooden originals from which it was derived. There is no instance, so far as is at present known, of their copying in stone rude natural forms, which may have been employed before the use of wooden architecture properly so called.

In order to understand what follows, there is one other remark I would like to make. Whatever was the religion of the early inhabitants of Greece,—I have been in the habit of calling them Pelagii,—it certainly was not idolatry. They have left no trace of images, or of temples adapted for their reception. It was apparently an ancestral form of worship, for which the so-called treasuries or underground chambers were perfectly suitable. But, on the other hand, the Dorians or Hellenes were essentially image worshippers, and it was of primary necessity with them that they should be provided with spacious and well-lighted chambers, protected from the weather, in which they could place their images, and render them the homage which was the principal feature of their religious observances.

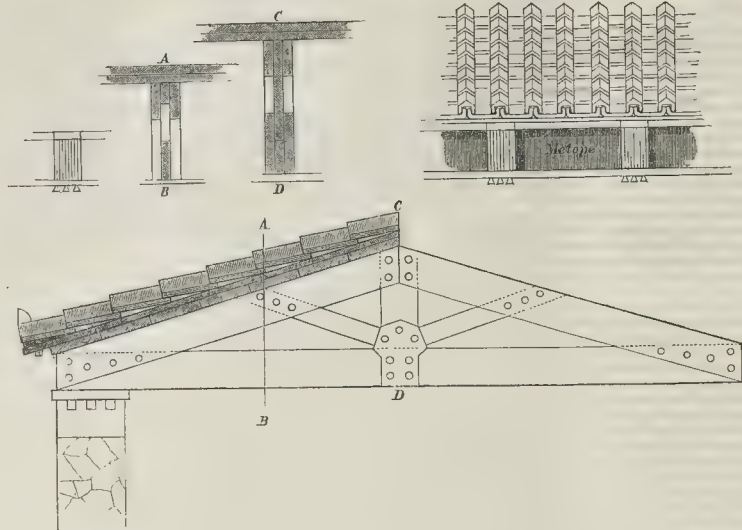
If these preliminaries are granted, even to a modified extent, we are enabled to approach with confidence the mode in which the Hellenic Greeks set about providing the temples they required for their worship. In a country possessing such experienced masons as we know existed in Greece in those early days, there could have been no difficulty about the walls of their cellas, and with regard to the roofs, all we are required to assume is that the Greeks were then able to fashion timber into planks, 1 in. or 3 in. in thickness, and from 10 ft. to 20 ft. in length. This does not seem an excessive demand on the ingenuity of people having reached such a state of civilisation, and possessing pine and oak forests to an unlimited extent, and who certainly built ships, and worked in wood in various other directions. But, without going into this question, it is sufficient for our present purpose to point out that in the earliest stone structures of which we have cognisance, the decoration everywhere simulates planks of varying thickness, and what we have now to explain is the mode in which these planks were disposed to form the roof of the early temples of the Greeks.

In the annexed woodcut I have endeavoured to represent the mode in which the early Greeks formed the trusses of their roofs, in so far as we can understand it, from subsequent examples in stone. In this instance, I have assumed the diagram to represent the truss that would be used to roof a cella somewhat less than 20 ft. in width. For this purpose they would use

\* Published, somewhat imperfectly, by the Society for the Promotion of Hellenic Studies, vol. ii., p. 122; and more perfectly by himself, in a pamphlet, published by Brockhaus, Leipzig, 1881.

† Owen Jones's "Grammar of Ornament," pl. x., 22 and 23; pl. xi., 1 and 6.





a tie-beam, say 20 ft. in length by 1 ft. in width, and say 3 in. thick. On each side of this were placed two similar planks, about half its length, but without any mortises or carpentry fitting beyond being cut to the requisite length. These were held firmly in their places, and combined by a king-post and two struts, as shown in the diagram. The tie-beam was connected with the king-post by two fashion pieces,—at D,—which supported the tie-beam in the centre. The whole of this system was connected together by trenails, which, with so simple a system of fastening than could be effected by any amount of mortising and nailing. In fact, I have no hesitation in asserting that this truss presents a stronger and more scientific combination than any that has been suggested or used in modern times. Considering that the early Greeks, though rich in gold and bronze, were poor in iron, it is evidence of their wonderful cleverness in design, that they should be able to produce such a roof-truss with such simple means. For our present purpose its value is that it naturally and inevitably produced the triglyph. It only requires that the edges of the three planks forming the truss should be bevelled, and the triglyph is formed in all its details. Its width, according to the diagram, was 9 in., its height rather more than 12 in., which is very nearly the proportion the triglyph always afterwards retained when repeated in stone. That it was by trenails that these planks were held together is rendered probable, not only by the experience of our modern wooden shipbuilders proving the superiority of them for such a purpose, but because nine-tenths of the system of Doric decoration consists of trenail-heads repeated in stone.

In the woodcut I have placed these trusses 3 ft. apart, though only because the construction seemed to demand it, and that this distance allowed of the introduction of a metope sufficient to light the interior. Above the trusses, the roof, I fancy, was formed first by 1-in. planks, placed longitudinally, so as to keep the frames in their places, and crossed by other similar planks at right angles, on which the tiles rested. The tiles in all Greek examples, in all ages, were supported in front on the tiles immediately before them (as shown in the diagram), but the last tile in front could have no such support, and a fashion-piece was in consequence inserted to keep it at the same angle, and that was held in its place by a trenail or nut. The whole system rested on a tenia or wall-plate, which was held in its position by pins driven into holes cut into the stonework of the walls.

The diagram is perhaps sufficient without

description to explain many other points, but the proof of its correctness will be found if any one will take a drawing of the Parthenon or any other finished Greek temple. He will find all the parts of it repeated in stone, with this only alteration, that in stone they multiplied, as a decoration, those parts which were used, but hidden in the woodwork. Thus in the entablatures of the Parthenon they introduced eighteen trenail-heads, when one, or at the utmost three, would have sufficed, and under the triglyphs six guttae, when, in reality, one would have been sufficient in that length; but otherwise, every other form is copied with singular fidelity.

The proof that these early temples of the Greeks were lighted by external metopes is more complicated, though not the less certain, but such as cannot be entered upon at the foot of a letter. When the proper time comes I hope to be able to show that when, in a subsequent age, the peristyle arrangement was introduced and adopted in nearly all Greek temples, it caused a revolution which changed nearly all its features of temple architecture. The architrave, the triglyph, and the metope were transferred from the top of a wall (for which they were first invented, and where they had a distinct purpose and meaning) to the summit of a range of columns, where they had no constructive significance, and became mere ornamental features, barely recalling their past uses. As the introduction of this colonnade rendered the external metope no longer available for lighting, it was transferred to the interior; and I believe I can prove that all Greek peristyle Doric temples, from the small cella of the Temple of Egina to the glorious clearstory of the Parthenon, were lighted by internal metopes or their derivatives. By this means I hope to solve one of the few remaining problems that remain unsettled in the history of Greek architectural art.

JAS. FERROUSON.

**Clapham.**—The foundation-stones of a new Baptist Chapel in Grafton-square, Clapham, were laid on the 4th inst. The present chapel on Clapham-common having become too small for the increasing congregation, a sum was raised to purchase a freehold site in Grafton-square, and it has been decided to build a chapel capable of seating about 1,000 persons, with school-rooms, lecture and class rooms, and other requirements. The architect is Mr. W. Niven, and the builder, Mr. F. Higgs. The sum of 1,075*l.* was paid for the land, and the amount of the contract for building the chapel is 5,572*l.*

#### ETCHINGS OF KENSINGTON GARDENS AND HYDE PARK.

THESE are six etchings from various points of view in Kensington-gardens and Hyde-park, executed by Mr. Tristram J. Ellis (whose water-colour views of scenes in the Holy Land we had occasion to notice some time since), and published by Messrs. Field & Thier. They are accompanied by a sheet of six parallel columns of text, giving some of the historical particulars in connexion with each scene.

Mr. Ellis's etchings are in the true style of free etching, making no attempt to imitate the effects of engraving, but showing the etched line frankly. They are topographically very accurate, and perhaps even err on the side of being too indifferent to effect; they are views rather than pictures. This remark hardly applies, however, to the first one, which represents Kensington Palace; here the old building and the lawn are very well framed in by the trees; and the bank of the lower part of the broad walk, which afford a powerful foreground, throwing back the building and the lawn in front of it. The foliage and trunks of the foreground trees are among the best bits of work in the set of etchings, free and effective in the treatment of the leafage, and accurately studied in the drawing of the branches. The distant trees around the palace are a little careless in form and scratchy in style, a remark which will apply also to some others of the etchings. It seems to be tacitly assumed that this kind of rough and scratchy drawing of etching style, or in at least to be condoned. We like to see lines have all a meaning, whether in etching or any other medium of drawing. In this respect the lines of the building would have been none the worse for a little more care, and we can see no reason why an etcher, in drawing buildings, even comparatively distant ones, should assume the right to indulge in a looseness of definition and raggedness of line which, in the case of pencil drawing, would be taken as an indication of an unsteady hand or an inattentive eye.

The second of the series shows a view looking down the Serpentine from the upper end, the terrace and fountains being supposed to be immediately behind the left of the spectator; the view is closed in by the bridge and the Hyde Park trees beyond it. The author makes some remarks in the text accompanying this print, in regard to the balustrade and terrace, which, as observed, are not shown in the view; his criticism principally amounting to a complaint that the work is in stone and not in brick, a criticism (if such it is to be called) which is



also applied to Rennie's bridge. The meaning of this is, of course, that they are not in the present fashion, and that when they were made stone was considered (and rightly) to be a finer and more noble material than brick. This etching is more remarkable for topographical correctness than for effect.

No. 3, "The Broad Walk," is a very good representation of the effect of chequered light and shadow under the trees which overhang the grassed alleys on either side of the broad walk. The walk itself is in the white glare of sunshine, a stripe of light running through the picture; the nursery-maids and perambulators who especially haunt this corner of the gardens are not forgotten. No. 4 introduces the Albert Memorial, seen from the Park eastward of it, relieved against a western sky. This is described as a "twilight" view; there is a little too much light for twilight, properly so called, but the effect of a subdued light is indicated by the manner in which the details both of the memorial and of the trees in the foreground are lost, and both are seen as dark silhouettes against the sky; the character of the long level stripes of cloud is that of evening also. The author was right in choosing this light by which to show the Albert Memorial in an etching; it might be possible for an etcher to make a brilliant study of the Memorial in full light, as a foreground object, no doubt; but as a middle-distance object nothing could be made of it except in the manner which Mr. Ellis has adopted.

No. 5, "Rotten Row, Midday," is the only one in which figures are largely introduced. The *forte* of etching does not lie in figures, except in larger-sized carefully-manipulated heads or figures on a larger scale than these; the artist has been fairly successful in giving the character of the groups which cluster about at the time of morning riding, but the charmingly-sketched foliage under which they are grouped is the best part of the work. No. 6, "The Serpentine," seen from the walk on the southern bank just eastward of the roadway which divides Hyde Park from Kensington Gardens, is the best of the set, because it shows most of the peculiarly characteristic quality of etching, which represents the opposition of light and dark, and is more effective the broader and more brilliant are the lights. In this instance, the broad walk which leads up to the foreground is an almost untouched mass of light, crossed by the thin dark bars of the long shadows from the trees; the Serpentine beyond is also nearly untouched, and it would have been more effective still if the artist had let the water at one altogether save in giving the darker effect of the reflections near the bank. But as it is, it is an admirable etching; the forms of the distant trees are better made out than in some of the others; the foreground trees are touched with spirit and truthfulness; the figures are effectively introduced, and the whole is full of light, that great desideratum in an etching. We are grateful to Mr. Ellis for the set, which, as a whole, forms a very agreeable and artistic record of a part of the environs of London which is full of picturesque points as well as of interesting memories and associations.

#### WATERLOO BRIDGE IN DANGER.

Do our readers remember the indignation which was expressed when, some years ago, we ventured to suggest that the effect of the great change made in the *regimes* of the Thames by the removal of Old London Bridge, and by the general improvement in progress with regard to the channel of the river, demanded that great attention should be paid to the Waterloo Bridge? We will not now recall what was then said as to our pessimistic views, although it is an amusing reminiscence that the writer of these lines, on asking an ancient servant of the Bridge Company whether certain indications of movement had been noticed, received the curt reply, "Oh, that is only got up by one of them penny-a-line fellows, as knows nothing about bridges."

We now see the statement in print that it has been known for some time that Waterloo Bridge was in almost a dangerous condition, and that "there is reason to believe that a worse element of danger than soot is at work, as there are some indications that the pier next but one to the southern end of the bridge is sinking bodily." The writer goes on to say, "the foundations are carried on piles driven deep in the clay, but a

London clay is well known to be a treacherous material, and the probability is that the failure of the bridge is due to this cause." We should like to hear in what way a subsidence, not due to soot, but affecting foundations carried on piles driven deep in the clay, is supposed to have occurred. And also it would be interesting to know on what authority this account of the foundations is given. For our own part, we make free to doubt the accuracy of the description. Our authority for so doing is the unimpeachable one of Sir John Rennie, the engineer of the bridge. "The piers and abutments," says Sir John, in his Autobiography (page 33), "were founded on the solid bed of the river, which is strong gravel. They rest upon a wooden platform, supported upon piles 12 in. in diameter, driven 20 ft. into the bed of the river." At London Bridge, where the piers were founded 28 ft. below low water spring tides, we are under the impression that the piles are in clay, although the material, strangely enough, is not mentioned in the work we have cited. But we find in another place the information that "the shallowest piers of Charing-cross and Cannon-street Bridges were sunk 25 ft. into the bed of the river, and for the most part the piles penetrated stiff London clay, with beds of septaria." (Min. Proc. Inst. C.E., vol. 43, p. 123). "With regard to Waterloo Bridge," the same authority, Mr. Hayter, states in the place that we have quoted, "he believed that it was an artificial barrier. The piers were shallow, and in order to protect them,—that is in 1877,—it had been necessary to throw stones around them, which created a backing up of the water." It is obvious that this mode of narrowing the waterway tends to scour out a deeper channel under each arch.

In the course of the same discussion (on the subject of the River Thames), Mr. Redman stated that the blue clay at London Bridge was 20 ft. or 30 ft. below the base of the piers. It is thus rather to the removal of gravel by scour than to any peculiarity of the London clay, that we expect that any subsidence will prove to be due. The steady increase of the tidal range of the Thames, although a feature which the conservators of the navigation regard with satisfaction, is thus not without its drawbacks. In 1879 Mr. Redman reported that "the mean low-water of the entire year was 1 in. lower than any analysis showed for forty-five years, and that the high water of the entire year is now nearly 3 in. higher than any year prior to 1875." Deeply as the removal of such a beautiful structure as Waterloo Bridge would be lamented, we are disposed to think that the safest and ultimately cheapest course would be to undertake an immediate rectification of the sinking pier,—if sinking it be,—a task not beyond the capabilities of the structural science of the day, although involving the temporary stoppage of the traffic. But if the amount of technical skill that is brought to bear on this grave architectural question be such as would be contended with the expedient of throwing stones into the river to protect the piers, we shall soon have to say, *Pons fuit*.

#### DINNER OF THE INSTITUTION OF CIVIL ENGINEERS.

The annual dinner of the Institution of Civil Engineers, which took place at Willis's Rooms on the 1st of April, was more conspicuous for the display of eminent and illustrious guests than for any such anticipations of the wonderful revolution to be wrought by the labours of the profession as we have had to notice on some former occasions.

His Royal Highness the Duke of Edinburgh, fresh from a lengthened cruise, spoke of his experience as to the works of the English engineers in every quarter of the world. "No Society so important, I believe," said his Royal Highness, "as the one which is assembled here to-night,—the Institution of Civil Engineers,—exists anywhere throughout the world." It may be remarked that it would be difficult to point anywhere to a more characteristically English institution. In this English character consists both the strength and the weakness of the association. With a more complete organisation, and with the introduction of the habit of voting on the debates, the power of the Institution would become very great, and the service which it would enable its members to render to the country would be enormously increased. On the other hand, from the days of its early and

humble origin under the auspices of our great self-taught engineers, the Society has always on the very title-page of its proceedings, disclaimed the utterance of any corporate voice. The rule has been in accordance with the sturdy independence of the English character. It results that in the Minutes of the Proceedings, while we have an invaluable store-house of facts, and often a lucid commentary from the uncontrolled freedom of debate, we have no outcome,—no *précis*,—no definition of those principles which, on the assent of the *corpus* of the profession, are to be laid down as the skeleton of all future practical improvements in industrial science. This, we think, is a loss to the world; but so it is; and we must be thankful for what the Institution has actually done for us; especially in the creation of so admirable a professional library as is composed of the sixty-six volumes of the Minutes of Proceedings. As to the value of this work, perhaps no one is so competent to speak as the professional writer, who finds, in the daily rise of new mechanical questions, almost always some light to be derived from consultation of Mr. Forrester's excellent index to the Minutes of Proceedings.

The Duke of Edinburgh delivered a most happy *ex quocumque* in his reference to the ventilation of Willis's Rooms. Those who are familiar with the condition, not so very long ago, of the very home of the Institution itself (now happily set right) will smile at the aptness of the proverb as to the wife of the shoemaker and the mare of the blacksmith being the worst abode.

His Royal Highness the Commander-in-chief made some very apt remarks, which ought to be widely read. The mode in which the progress of invention, in artillery as well as in engineering, is constantly oversteering all official calculation; and how the public will on one side raise the cry "profligate extravagance," and on the other side "treacherous negligence," was very forcibly hinted at by the Royal and gallant Duke. Lord Northbrook could not avoid the expression of the hope that the moral support of all Englishmen, in every assembly, would be given to the Government in the difficult task which they had rendered it necessary for themselves to discharge, in the protection of life and property in Ireland. But he did not connect the task in any way with his hosts. The Duke of Buckingham, speaking as a landowner, said, "I can myself testify what we owe them (the engineers) for the facilities they have given us for developing the produce of our land"; thus referring to a branch of professional science which, if we look back to the infancy of the Institution, we may call entirely new. Sir Michael Hicks-Beach spoke of the engineer as a witness before Parliamentary committees, in terms which recall the memories of Stephenson, Brunel, and Rendal. "There is no profession," he said, "more brilliant in conception, more fertile in resource, more excellent in administration, than that of the Civil Engineer. Members of Parliament who have heard them before committees can testify that there are none whose intellect is keener and more lucid, or whose judgment and argument are more true and logical. They are especially men not of words, but of deeds, and I cannot help hoping that some day or other the country may draw a moral from the success of the profession of civil engineers, and look rather to deeds than words in the choice of its administrators."

Mr. C. H. Gregory recalled the fact that out of the 4,000 members of all classes of the Institution of Civil Engineers there are about 800—one-fifth of the total number—actually employed on public works in India and the colonies. Sir H. Parkes referred to the harbours that have to be sheltered, the rivers that have to be bridged, the coasts that have to be lighted, the railways that have to be made, and the whole vast field which is crying out for the aid of the engineer in Australia. The Earl of Ravensworth spoke of the engineers of England (in terms which would have been at least as appropriate if applied to the Royal Institute of British Architects) as the greatest "benefactors of the country by utilising and applying to the public well-being the three precious gifts of the Creator,—light, water, and air."

A Brass Eagle Lectern has just been presented to St. Philip's Church, Leokhampton, Cheltenham. The lectern, which is richly engraved and jewelled, is supported by four massive lions at the base. The work is by Messrs. Jones & Willis.



## MR. POYNTER ON DECORATIVE ART.

The last of the series of lectures given in support of the Society for the Protection of Ancient Buildings, was delivered on the 5th inst., in the Lecture Theatre of the South Kensington Museum, by Mr. E. J. Poynter, R.A., who took for his subject "Decorative Art."

Mr. Poynter said that he hoped those present would not expect from him a lecture bearing directly upon their houses or public buildings. It was difficult to say anything new on the subject that would go further than general criticisms founded upon broad principles, for details required a considerable amount of reading, more than he had time to give, in respect to the history of art; it also required special study and the knowledge of specialists, who had time to exhaust the subject. At the Social Science Congress, at Liverpool, in 1876, he had the honour of being President of the Art Section, and he then with much labour prepared a paper in which he laid down rules as to what was right and wrong in practical art. By an arrangement, which could not be avoided, it was not read till the end of the day's proceedings, and to his horror there was, in fact, no discussion among practical men, as every one was agreed in respect to general principles. He was led to the conclusion that to propound general principles was not of much use. There was no subject in which so much law was laid down as art, especially decorative art. Infallible nostrums were offered on all sides as to the adornment of their houses, while rules were even given as to the artistic treatment of ladies' dress. The requisites for decoration were, good taste and good execution, or rather workmanship. For good taste there were no rules. Training and example, not argument, were the only means by which a right judgment could be formed.

His attention to the subject of decorative art had been drawn by a visit to Rome and Naples which he made last autumn, especially by the paintings he saw at Naples, and still more at a house lately discovered in Rome, at Livia in the Palatine, and that still more beautiful house discovered in the excavations in the gardens of the Farnesian Palace. The original paintings had suffered very much since the house was uncovered, but the copies were admirable. As regarded the historical side of the subject, the writings of the ancient authors had been ransacked, and everything to be learned from them had been made public, so that no further information could be given, even if he were thoroughly familiar with them. It was quite hopeless to imagine that they would ever find any traces of the works of the great painters of antiquity referred to in Pliny and Pausanias. People had questioned whether they were deserving of the immense reputation they enjoyed; but, putting aside that, it was doubtful whether the remains of antique painting which existed had ever acquired in any work so high and traditional a reputation without deserving it. None of these great works existed to speak for themselves that he knew of. There was no instance of an antique painting signed by the name of a known artist, but upon vases the names of the artists who painted them were not uncommon. They all knew the style of the design painted upon the vases by taking at random a single figure. Some of these vases might present to them the treatment of celebrated painters, and some of them traditional subjects. Sufficiently emancipated from the earlier styles, their art, however, was incapable of representing the full force of nature in all its aspects; but the art of Polygnotus far excelled that of the painters of the earlier period of Italian art till it attained its high styles in Michelangelo and Raffaello. Polygnotus showed them splendor of composition and exquisite perception of form. One of the most remarkable things in Greek art was the perfect steadiness with which the Greeks drew the most exquisite lines on a rounded surface. It seemed almost incredible. They must have drawn the figures without taking their hand off the object. This was a perfection of execution which which was utterly unknown at the present day. In the sculptures in the pediment of the Temple of *Ægina*, the figures, which were perfectly archaic in the treatment of the heads, were not so in the treatment of the limbs. The paintings found about fifteen years ago in the Etruria were all older than the time of Polygnotus, and they might be some guide to his style. They were arranged in a bas-relief form with which they were familiar. When in Rome he saw these paintings, but being very unwell

at the time he could not remember distinctly the style of colouring. His impression, however, was that they were painted on white ground. It was not easy to guess Polygnotus's style of colouring. Pliny believed that the artist was very limited in the colours he used. They knew that blue certainly was used in the adornment of the temples long before the time of Apelles or Polygnotus. It was hardly necessary to mention that the Egyptians had used a variety of colours a great many years before Greek art began. Was it possible that Pliny made a mistake in referring to only four colours which Polygnotus used? He flourished about 420 B.C., and he was not included by the Greeks in the category of their great painters. They, no doubt, looked upon him as the critics of the last century looked upon the painters previously to Raffaello, not acknowledging their existence. Such was the view the Greek writers took apparently of the founders of their school; but Pliny was more enlightened, and he went further back even than Polygnotus. Imperfect as the works of these antique painters were, there must have been a special beauty about them. The absence of chiaroscuro and background must have brought into relief the simple colouring. So far as the art was then developed, the paintings of Polygnotus were probably perfectly limited in colouring; the modelling was of the simplest kind, but not highly idealised, though extremely subtle in form, while the composition must have been splendid. The school of painting soon developed those qualities which were to make it more complete and accessible. Henceforward they met in Pliny with numerous anecdotes of the perfecting of the imitative power, some of which were childish, and were founded on the works of Zeuxis, for instance, the story of the ignorant birds which pecked at his painting of some grapes. Besides that and similar foolish stories, Pliny constantly dwelt upon the increasing perfection of form, and referred to Apelles's celebrated painting of the *Anadyomene*. With the aid of the Greek vases and the Etruscan wall-paintings, they could form a fair idea of the works of Polygnotus; but there was this great difference, that between these and the paintings of later artists the style of Polygnotus was distinctly decorative and monumental, although asserting its claim on its own account. The works of Apelles and Pistagoras formed no part of distinctive design; they were movable, for many of them were transferred to Rome, and were bought and sold at public auctions. All the paintings of a later date which had been preserved were wall-paintings, and were executed by different methods. Those executed on panels could hardly help them towards forming an opinion. He (Mr. Poynter) thought that, as they found on the vases representations of the early paintings of the Greek school, in the panels which occurred in all the decorations in Pompeii and elsewhere they would find copies of great works if they only knew them, but unfortunately they had no means of judging which they were.

In the houses to which he had referred at Livia they had the finest specimens of antique decorations, it being evident that the best artists of the time had been employed to fill in the panels. There were no paintings of that description so good as were to be found at Pompeii. The paintings of this house remained only unfortunately in very small fragments, which displayed an art of design and skill of execution which justify any extravagant estimate which could be recorded. The skill of the painters and the certainty of their hand were almost beyond anything one could imagine to be executed, the figures being of the most finished description. They were perfect marvels of execution, and from them he had gained more belief in the surpassing examples of Greek painting than anything he had ever observed. As to the Farnesian Palace, the paintings there were executed, it was supposed, about the Republican period, the house being of the time of Tiberius. The architectural arrangements had none of the extravagance of the Pompeian style. Vitruvius would have objected to the supports of the figures, they not being logically consistent, but yet some of the most beautiful decorations were illogical in style. Throughout the pictures were painted in a very remarkable manner, being beautiful in design and finish. Those who had not seen Pompeian paintings had probably conceived a false idea of their beauty. The only guide was that detestable

Pompeian Court at the Crystal Palace, where the grossest colours were shown. Mr. Owen Jones's book was the only one which gave anything like a consistent history of the illustration of decorative art, but, for all that, he (the lecturer) would like to have that book at the bottom of the sea. The treatment of the paintings at Pompeii was remarkably characteristic of all the decorative painting which had come down to us; it was extraordinary in simplicity and perfect in precision and taste, everything being done at once without the slightest effort. The certainty of hand and the executive skill held as high a place as the subject of the design and the composition. The art of the people was a vivid expression of nature, and it conveyed an impression of fresh, healthy life. There was no straining after emotions, and in this sense the finest art of the Italian school did not approach the antique. In their statues and pictures the Greeks made every effort to attain perfection, but in these works of decoration they appeared to be quite unconscious of any effort to produce a fine thing. The only parallel he could think of in the perfect spontaneous art was in the vivacity in which Leech represented the humour of English life. If they wished to know anything further of this freedom he would refer them to some stuccoes in the museum, which had been taken from a Greek tomb, they being executed without the slightest effort with the finger and thumb, and were models of grace in the formation of the limbs; they were the most marvellous exhibition of the highest beauty, being done, apparently, with the utmost ease. The arrangement of the panelling was most beautiful, and the mere execution was the finest thing possible to imagine. The birds were perfect itself, for whenever the Greeks introduced wings they appeared to grow naturally, nothing being forced or unnatural. The Greeks' instinct of beauty was expressed just as spontaneously as the works of Leech, which were the most natural production of modern art they had; his works were admirably drawn, and were wonderfully true to nature, being as vivacious in execution as possible. In the laborious works of the present day this state of things did not seem to be approached. The only art similar in this respect was that of the Japanese, who took a pleasure in their work, and there was no conscious effort in their productions but the expression of beauty. In the representation of birds and flowers they were unrivalled. While, however, they found the highest perfection and completeness in their works, they did not like laborious finish. The Greeks had a want of knowledge of perspective; they, in fact, never discovered correct perspective, and the great artists of that school were equally ignorant of the rules, which when once known could never be lost, but to some extent they were fortunate in not mastering a knowledge of the perspective for it could not always be practised, as he knew from experience in designing the dome of St. Paul's. Landscape was a matter the Greeks of that day never turned their attention to, everything being concentrated on the beauty of the human figure.

In conclusion, Mr. Poynter said that he had laid down no rules in decoration, but he would be glad if his remarks revived an interest in antique art in which some years ago many cultivated Englishmen took the lead. The very simplicity of Greek art was so misleading that there was a danger lest its infinite superiority to every other art should be lost sight of, for they knew that Greek sculpture far exceeded anything that could be done, and, in some respects, the best Italian painters were children as compared to the Greeks. They remained lost in wonder at their works, and consequently he regretted the decline of the taste for antique art, for many of the beautiful works collected fifty years ago were leaving the country, and the French were having the benefit of them. The English had turned their attention to the collection of china, but there was more art in the little finger of one of the Greek artists who did these great works than there was in the whole Chinese nation. An experiment of decoration in the Pompeian style had, as they knew, been tried, but it was now completely out of fashion, yet it seemed to him that no more beautiful system was ever devised. He could quite imagine a servile imitation in the decoration of a house in the spirit of antique art, but the mistake had been made in copying literally not only the style of the work, but the details and accessories, which had no mean-



ing for them, because they had to deal with a state of things which had entirely passed away. Nobody seemed to have had the sense to apply it to the phase of life in which they lived at present, but he saw no reason why it should not be done. In any case, an attempt in this way would make a variety from "dados and diapers," which appeared to be a necessity in modern decoration in a house.

#### ART FOR THE PEOPLE.

THE best picture exhibition open in London during the last fortnight has been in the school-rooms connected with an East-end church.—St. Jude's, Commercial-street, Whitechapel. An experiment in this way was made last year by the vicar, the Rev. S. A. Barnett, and Mrs. Barnett, when a considerable number of paintings and other objects of artistic interest were collected, and opened to the people of the neighbourhood at a very small charge, and on one or two days free. This year it was determined to repeat the attempt without making any charge for admission, trusting to the help of those who might be sufficiently interested in such a work to assist in defraying the expenses. The exhibition this year has been confined to pictures, which have been lent by various owners and artists, and the style of the collection is more calculated to come home to the sympathies of the people than that last year, which contained a good deal too much of the "intense" school of painting,—not, certainly, the style of art adapted to appeal to the sympathies of hard-worked and little-educated people. The present collection contains the finest pictures that I have ever painted, besides several of his lesser but always interesting and pathetic works; and a considerable number of Mr. Brett's small oil-studies for his larger paintings, lent by their owner, Mr. T. L. Devitt; which have not, as far as we remember, been ever exhibited publicly before, and are alone worth a visit. Among other things the collection includes also Munkacsy's fine work, "The Lint Pickers"; Mr. Britton Riviere's "Roman Holiday," which was in last year's Academy; a splendid specimen of Clay's work, "Onward Bound"; several good pictures by Messrs. Long, Collier, Burgess, &c.; a fine portrait by Sir Frederick Leighton; paintings of peasant life by Jules Breton, Billel, and others.

The exhibition seems to have answered its end completely so far as arousing the interest of the neighbourhood, the attendances from the first having averaged two thousand or so daily. The committee got up a catalogue, sold at the price of a penny, in which the principal pictures received some brief explanation or comment calculated to direct attention to the main point in the picture, or to suggest a moral to be derived from it. Some of the quotations appended seemed a little above the heads of the intended readers, and it certainly struck us that the moral element of art was a little more emphasised than is consistent with what, after all, is the real object of art, intellectual enjoyment. But it must be admitted that the intellectual enjoyment of pictures, the grasp of all that painting has to say to the mind, is not attained but by long training and the habit of seeing and thinking of pictures; and that in presenting paintings to a comparatively uneducated public the best chance of arousing interest in them may be to dwell first on what the painting actually tells, leaving on one side for the time, what to the artist is nevertheless the ultimate consideration, *how* it tells its story. Certainly, from the observations gathered during one or two visits, we should have said that there seemed to be no want of serious interest on the part of the visitors: people who had hardly seen high-class pictures before went about with their catalogues in earnest study, and any better-informed visitor who had a few words to say about the paintings was sure to be surrounded at once by an eager "tail" of listeners.

It is probably a good deal due to this personal influence that there seemed to us to be a much more lively interest aroused by this comparatively small, though very good, collection of pictures, than we have seen in regard to the much larger collection of Sir Richard Wallace's pictures which were for some time at Bethnal-green Museum. The people went to those, but not with much eagerness or enthusiasm, and, as far as we remember to have observed on different visits, they inspected the pictures in a languid and indifferent manner,

and as if rather puzzled than pleased. Any class of people, in fact, who have not been in the habit of giving their minds to artistic work, need to be, in the first instance, taken by the hand and helped on their way into the Temple of Art. This is what Mr. and Mrs. Barnett, and the friends who have worked with them, seem to have been aiming at; and certainly with great appearance of success; and though we should not endorse (from the point of view of art-criticism) every remark we read in the catalogue or heard made in the room, we should hope that the effort thus made to bring many people within reach of a new and higher form of enjoyment than they have generally had access to cannot be without its permanent results for good, and that even in regard to the moral teaching to be derived from pictures, though that is not the first or direct object of painting, ideas may have been sown in many minds which will bring forth fruit hereafter, and lessons impressed all the more vividly because accompanied by the pictorial representation which fixes itself on a memory from which mere words might slip away. Our only regret is that such an exhibition could not be kept open, under such circumstances, for a longer period. It has been necessarily limited, however, to the time when the schools were not in use during the Easter vacation, and closes on Sunday evening next. It is worth observation that it was kept open during the greater part of Sunday, and filled by a most quiet and orderly crowd; an additional instance of the value of providing such means of interesting people on Sundays, and of the degree in which they are appreciated. Those who have provided such an exhibition have been doing a very good work, and one which we hope may now be a continuous and annually increasing success, and do much to widen the sympathies and interests of a portion of the community whose ordinary course of life is necessarily more or less bound within dull and mechanical routine.

#### "ART NEEDLEWORK."

5. *Opus Consutum*, Dr. Rook translates as "out work," and under it classes work which we now know as "*appliqué*" work. Here, again, we have a distinct method of using materials for embroidery purposes. But this "out work" is not always "*appliqué*" work. A fashion obtained, and may still have some followers, of taking two pieces of material, and at one and the same time cutting out from them the same pattern. Thus, after the manner of a puzzle or a mosaic work, the portion which might be cut out of one piece could be fitted into the opening which would correspond with it in the other piece. Much effective work can be done, and with comparative facility in this way.

I have now touched upon a few of the principal classes of stitches. Many embroideresses, I know, hold that there are as many stitches as there are stars in the heavens; but the more frequently I examine needlework, the more forcibly does the conviction possess me that acquaintanceship with the art may be improved by grouping like stitches with like, and bundling them together under common sectional names. To this end, whatever defects and flaws we detect in Dr. Rook's titles of stitches, we may, I think, welcome his attempt to give us, at least, a simple classification.

In the fourteenth century the style of design for art needlework appears to have remained much as it was in the previous century. The stitches used were generally the same. If there is a particular feature in design for decorative needlework of this period, it is perhaps the use of separate details like four-winged cherubim standing on a wheel, curious floral and leaf devices, which appear to have been worked separately, and then stitched upon velvet cloths, &c. Of such work a fine example is lent by Mrs. Bayman, who dates it as early fifteenth rather than fourteenth century. In this, again, we have the double-headed eagle, which we have noted in the chasuble of Boniface VIII., and we have also the fleurs-de-lis, which in this form date from the heraldic period of ornament. It is interesting to note, too, that last year, at the Kensington Museum, a French owner contributed a cope very similar in design and work to Mrs. Bayman's, and I think he called his Spanish,—a flight of imagination which is rather apt to mislead than other-

wise. The nationalising of works of art is rather special work. So long as your work may be authenticated as coming from the studio or workshop of a certain artist, then you have safe grounds for giving it a nationality; but without this, nationality is almost impossible. How, for instance, would you deal with the cope above mentioned, which, if Mrs. Bayman's altar-frontal is English, must also have been English? Again, how are you going to identify as Spanish, embroideries which the excellent authority on "History of Art in Spain," Señor Riaso, says are precisely similar to certain important specimens presented by the German Emperor Frederic in 1489 to Cardinal Mendoza at Toledo? These are by-considerations which require much time to properly discuss.

Returning to sections of ornamental needlework, we may refer to the use of gold thread in the heraldic and ecclesiastical embroideries of the twelfth to the fifteenth centuries. As a rule, the working of such gold thread embroidery is very similar to Indian and Persian methods of embroidering scroll forms in gold thread. The thickness of golden cords or threads is greater than that of silks and wools, and the gold threads are naturally more stiff. As a rule, these threads are held to the surface of a stuff by small stitches made with fine silks, and instead of being inwoven and actually incorporated with their grounds, they lie in relief upon their surface. This idea of relief embroidery, of which I do not think we can find traces in embroidery anterior, say, to the ninth century, had an attraction for Mediaeval embroiderers in Europe, and no doubt, too, amongst the earlier Oriental and Byzantine embroiderers. Out of it grew the practice of varying the lay of the gold threads so as to obtain a basket-work effect, a diapering effect, and so forth. With improvement in the art of depicting and drawing form, which rapidly developed in the fifteenth century, the figuring of saints under rich architectural canopies, done in relief of golden threads, was adopted, and many extraordinarily rich specimens of this gold thread-work of the fifteenth and sixteenth centuries are extant, chiefly in the form of sumptuous bands or orphreys to chasubles. Dr. Rook quotes an interesting passage from Vasari, in which a lengthened description is given of a series of splendid church vestments, consisting of two dalmatics, a chasuble, and a cope, all of gold-wove velvet, designed by Antonio Pollaiuolo. He relates that "the bordering and ornaments were of stories from the life of St. John, embroidered with the most subtle mastery of that art, by Paolo da Verona, a man most eminent of his calling, and of incomparable ingenuity. The figures are no less ably executed with the needle than they would have been if Antonio had painted them with the pencil." I should much have liked to have had a good example of such embroidery to show you; but specimens are not easily procurable, and the best I have been able to do is to get a photograph of an example in the style of these Italian embroideries. This photograph is of part of a pall belonging to the Fishmongers' Company. It is said to have been used at the funeral of Sir Richard Walworth in the time of Richard II., that is, A.D. 1381, but the character of design and work place it at least 100 years later, and it is possibly a work of the early sixteenth century. Of less pretentious character, and somewhat simpler workmanship, is this little panel of a saint, which at one time, no doubt, was part of a set of panels upon an orphrey. You will find here photographs of other gold thread works, and specimens of gold couchings in this Persian saddle-cloth, which may date from the sixteenth century, and in this German op, which dates from the late seventeenth century.

As we progress towards later periods of the fifteenth and sixteenth centuries we find a profusion of works and stitches. Embroidery seems now to become more domestic; that is, it is applied to articles of use in houses and for ordinary costumes. And in regard to such embroideries I may refer to the publication of pattern-books for needleworkers. You all are acquainted with Berlin woolwork, and have probably long since discovered how very unsuitable a style of work it is for the representation of patterns in which flowing lines, and subtle blendings of colours, shadows, and lights are to be characteristic. What, for instance, can be more unsuitable for reproductions in this rectangular work than, say, Mr. Millais's picture of the young lady tying a white



scarf on to the arm of her Huguenot lover. And, again, how tasteless is the rendering of a basket of flowers, or a spaniel upon a cushion in such embroidery. And in connexion with my remarks, I may direct your attention to this very finely-worked panel of the intended sacrifice of Isaac by Abraham as well as to the floral decorations of a set of pockets which our forefathers used to hang up by their bedsteads. I will not here raise the question whether under any circumstances designs such as these are ever suitable for the embroiderer's art. That would open on to a large field of argument, and it would occur to you at once to remind me of the fine effects of pictorial and naturalistic treatments to be seen in either the golden orphreys of the fifteenth century, or in noble arras hangings, or French, Spanish, and Italian tapestries. Raffaele himself considered that great compositions like his well-known cartoons were specially suitable for tapestry. The particular phase of art-needlework analogous to modern Berlin woolwork which I think is worth studying in its special relation to cross and tent stitch is that as we find it in Italy of the sixteenth century. Before canvas was generally used as the ground for this cross and tent stitch-work embroiderers regulated their stitches by the wool and warp of a linen material. Sometimes they drew out threads of the wool and warp to make an open reticulated ground, and this sort of work went under the name of *Reticella*. In pattern-books of this period you will see many designs for squared work. Black and red silks were often used, and the designers, conscious of the restrictions which were imposed upon them in this style of work, had the happy knack of adapting to the particular requirements of the materials to be used the ornamentation which they considered might be successfully produced thereby. An important point to be noticed in regard to Italian cross and tent-stitch work is that most of it was done in two colours, that is, the ground might be white linen and the embroidery would be done either in black silk or in red silk. From simplicity in employment of colour followed simplicity and real richness of effect, a matter which, in embroidery, is important, if not above, very correct and careful draughtsmanship. Neither of these qualities does Berlin wool-work, in its ill-judged attempts to attain to polychromatic pictorial effects, possess. The charm of modesty, as we might call it, in colour, has not taken sufficient hold on us in much of our so-called art-work. I am afraid, as a rule, we like something which we call bright or handsome. Brilliant green leaves, vivid red roses, bright-rendering blues, and what not. On the other hand, we sometimes, I think, imagine that we are scrupulously seeking for pleasant harmonies in shallow or dirty tones of colour, and thus we become as and in this direction as we may have been outrageously rollicking in the other. Please do not be alarmed if I venture to mention a *via media*. It is, as I know, an expression frequently associated with religious thought. The *via media* I offer for your consideration affects the less important atmosphere of art-needlework; and one means towards reaching it in respect, say, of cross-and-tent stitch embroidery is, I think, by studying examples of the sixteenth-century work done after the patterns published at that time, and by endeavouring to absorb the reason why these patterns are so suitable to embroidery of this class. Before quitting this section of work, I may remind you that cross-and-tent stitches were also used in the thirteenth and fourteenth centuries.

There was quite an outburst in England of embroidered linen works in the sixteenth century, and in evidence of this we have here some charming specimens of simple and effective embroidery on linen, lent by Lord Middleton. Less useful work in the true Berlin wool-work style were produced by great personages, such as the famous "Bees of Hardwicke," Queen Elizabeth, and Mary Queen of Scots. The latter is said to have worked little satires in this sort of stitch,—depicting Queen Elizabeth as a cat and herself as a mouse. Amy Robsart's name is connected with crewel work in long and short stitch of this style, and this sort of embroidery is much practised nowadays, but usually less extravagant and cumbersome. At the same time, such modern work as this specimen of woolly irises upon a velvet ground, however skilfully they are made, is not, I think, of very commendable taste.

The admirable scale of colours obtainable in

crewels is at present superior to that of our old friends, the Berlin wools, and it no doubt rather encourages us to portray with our needles many subjects we should, with better judgment, reserve for our paint-brush. The idea that needle and thread should be expected to produce effects similar to those of painting does not sufficiently weigh with us. We give way too easily to our inclinations to do something, without respecting the conditions which the materials and their use and suitability for use place upon us. In the many pretty specimens before us, like the mirror-frame, the bellows, the bookcase, not to mention the gorgeous plush table-cover,—(think how the plush will get marked when anything heavy is put upon it, and what a snug home it is for dust, which the housemaid must inevitably rub in when she brushes it down),—in all these articles, pretty and attractive as they are, what a lesson of unsuitableness do they teach? But besides this sort of unsuitableness,—the admission of which rather affronts us than otherwise,—there are other instances of misapplied workmanship. For instance, in the last century it seemed to be necessary for embroiderers to follow the then prevalent taste for a spurious classicism, by representing figures such as those which Angelica Kauffman frequently designed and Bartolozzi engraved. There was no real occasion for embroiderers to have done this. The previous century had supplied Europe with magnificent specimens of Oriental needlework of all sorts. Fine quiltings, as in this exceptional example of Indo-Portuguese work lent by Mr. Montague Guest, as well as sumptuous chain and satin-stitch work from India and China. However, the embroiderers would persist in their pseudo-classical bent, and the result has been that we have numerous curious relics of a pastoral character. Phyllis, Corydons, Amazonas, and Lavinias, neatly portrayed in feather stitches, mounted into oval medallions, and so made to serve as fire-screens. Then there were phases of mixed work,—works which displayed the ingenuity of the embroiderer to evade difficulties by using substitutes for needle and thread, as, for instance, in the case of this chair-seat, appropriately worked with a group of musicians, whose faces and hands are of painted silk. How far all such work was either congruous or charming I must leave to your opinion. The curiously wrong-headedness of some, that embroidery was to compete with painting, was carried to its furthest limits by Miss Linwood. Her workmanship was excellent, but her application of it quite misdirected. I do not think she could ever have known of such needlework as this Persian square of linen embroidered in silk, and exhibiting a nice harmony of colour and even distribution of surface pattern, or even of this bolder kind of work, which, I am told, was made by Bulgarians years ago. Miss Linwood probably never saw such suggestive peasant embroidery as this Cretan work, and so she (certainly just as the Persian, the Bulgarian, and the Cretan) had to comply with the circumstances influencing her taste. The result was that she became known as a skilful embroideress, who would work you portraits in cross stitch, just as the Roman mosaic workers will undertake to produce little miniatures done in minute square tesserae. Both these distinct sorts of work are, to my taste, quite inappropriate, however skilfully they may be carried out. The fact, however, of their existence weighs with a good many people, and because such things have been, a curious respect has grown up for them, and the admirers feel aggrieved if we tell them that their admiration or respect is misdirected towards an unworthy object. I do not sympathise with persons who, having become aware of the unworthiness of such works, would sweep them out of memory. I think that records of mistakes which have been made are sometimes quite as valuable as the records of successes. And so, whilst deploring much of the eighteenth century embroideries as I have done, you will not misunderstand me if I say that I am glad to have had the opportunity of being able to refer to them.

For much instruction in well-balanced ornament and harmonious colouring, we may, I think, profitably turn to many of the embroideries of Persia. Indian embroideries are frequently more gorgeous, and sometimes, indeed, almost tiresome in their gorgeousness. China supplies us with most accurately-worked embroideries, many of them in satin stitches, others in chain stitches. From Japan comes somewhat similar

work; and from China, Japan, India, and Persia we often get extremely fine specimens of gold-thread couchings. The antiquity of the arts of India is generally known. You may see here one or two drawings of native craftsmen at work upon pieces of embroidery, and this, as true of what now takes place in India, may be equally true of what took place then, perhaps a thousand years ago and more.

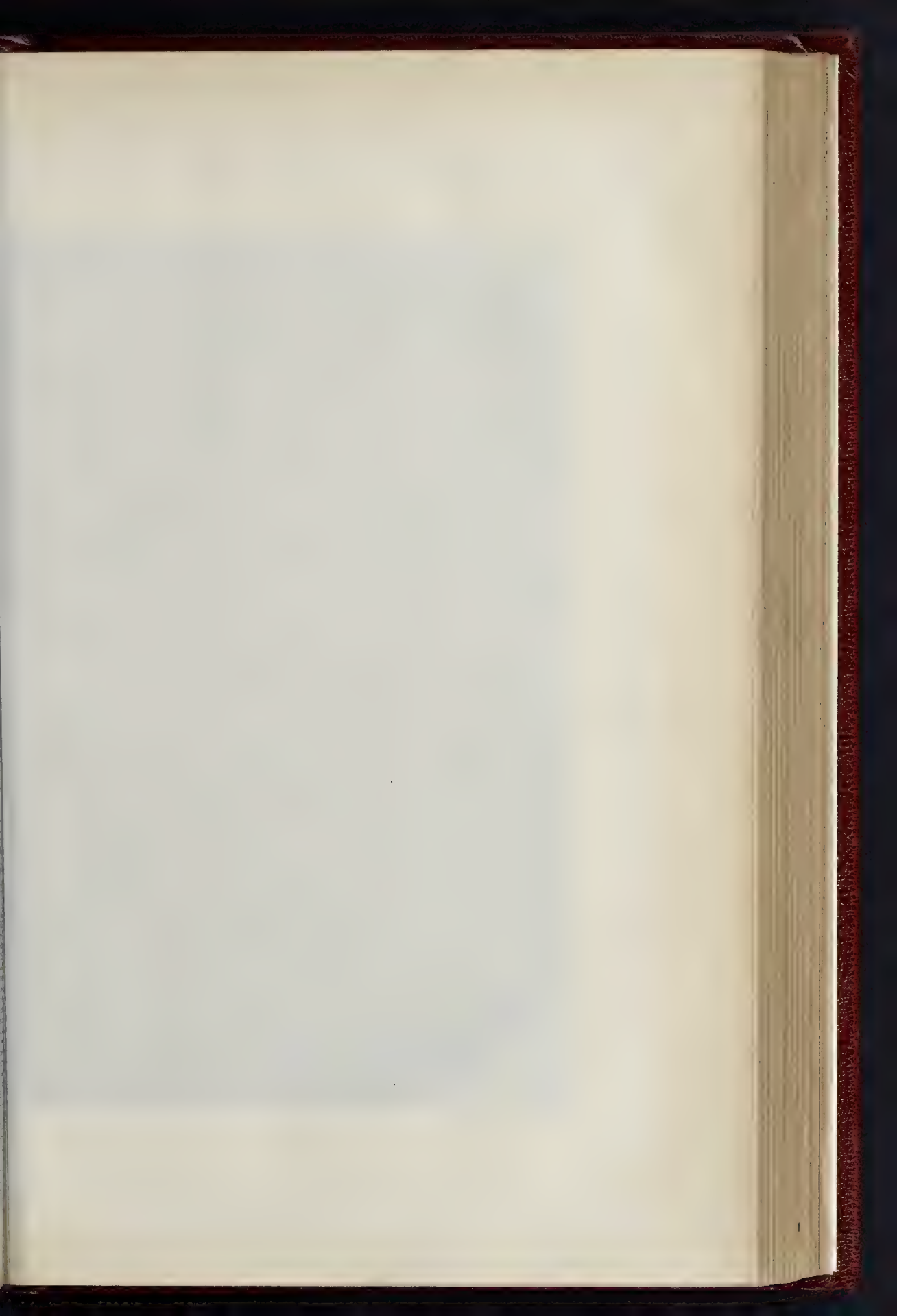
I have omitted many classes of embroidery which have an interest, such as English padded or "stump" work of the sixteenth and seventeenth centuries, which, however, was in a way an outgrowth of *appliqué* work. Then there was a phase of quilted work, when, besides elaborately quilting large coverings and hangings, flowers and highly-detailed ornaments were also worked upon the quilted ground. It is, however, an impossibility to include everything relating to ornamental needlework in a single lecture. If one takes a glance over the progress of the art during the last 1,900 years, we seem to pass from stage to stage somewhat in this manner. We commence with woven works, then we have cloths, &c., to which jewels are fixed; then comes working with gold threads, particularly for heraldic and ecclesiastical works, of conventional design; then we find an outburst of stitchery, and rich and well-considered patterns and motives are worked, and the character of materials duly respected; then comes an influx of Indian and Chinese embroideries, with naturalistic and conventional ornament rendered in very perfected stitchery; then there is the development of domestic embroidery, with pictorial vagaries, and many misapplications; and at length embroidery is turned to any purpose any one likes. It may be used to make a picture, to decorate articles of furniture, and so forth. The revival of the art which has taken place lately in this country is very much due to the desire of influential persons to trace out in a marked manner a remunerative occupation for women. Formerly men as well as women did embroidery as is instanced in Henry VIII's time, when George Giffard writes a report concerning the inmates of a religious house at Woolsthorpe, near Grantham, and speaks of there not being one religious person there who cannot either embroider or write books with a very fair hand, making their own garments, carving, painting, and graving,—a view of monastic life which has recently re-appeared in a romance called "John Inglesant," which is attracting much attention.

At the present time we are constantly hearing of aesthetics, which I take to mean a knowledge, and an understanding of principles which guide us in our practice of or liking for an art and its beauties. The pretence of having this knowledge, and the ludicrous results of this pretence, have excited the faculties of caricature artists like Mr. Du Maurier and Mr. Gilbert. The former week by week calls our attention to these affectations in *Punch*, whilst to many months thousands of people in England and America have been entertained by Mr. Gilbert's satirical humour in the opera of "Patience." There is a serious side to aesthetics, however, and all who are engaged in the pursuit of an art know the value of it.

Now, in regard to ornamental work done with needle, it is necessary for those who attempt this work to have some power of drawing and of harmoniously using colours. Besides this, they must be able to do various stitches. They should train themselves to understand the characteristics of the different materials they have to use, and perceive the suitableness of these materials for different purposes. Then there is the consideration of the suitableness of the different stitches in regard to different sorts of threads, cotton, flax, crewel, silks, gold and silver, and such like. Besides these points, the suitableness of the design which is to be embroidered has, of course, to be duly weighed, and in the construction of the ornament enter all those regulating principles of composition without which the imagination is apt to run wild, and uncontrolled exuberance render itself responsible for all sorts of grotesqueness and ugliness.

Ornament, produced as it must be in material, must, I think, be subservient to the material selected. We have noticed specimens of embroidery in which this principle is set aside, and materials by themselves satisfy you as being beautiful. I cannot help thinking that it is hardly wise to attempt to increase the beauty by any artifice. Feats of ingenuity which set such a rule at defiance as





THE BUILDER. APRIL 15, 1882



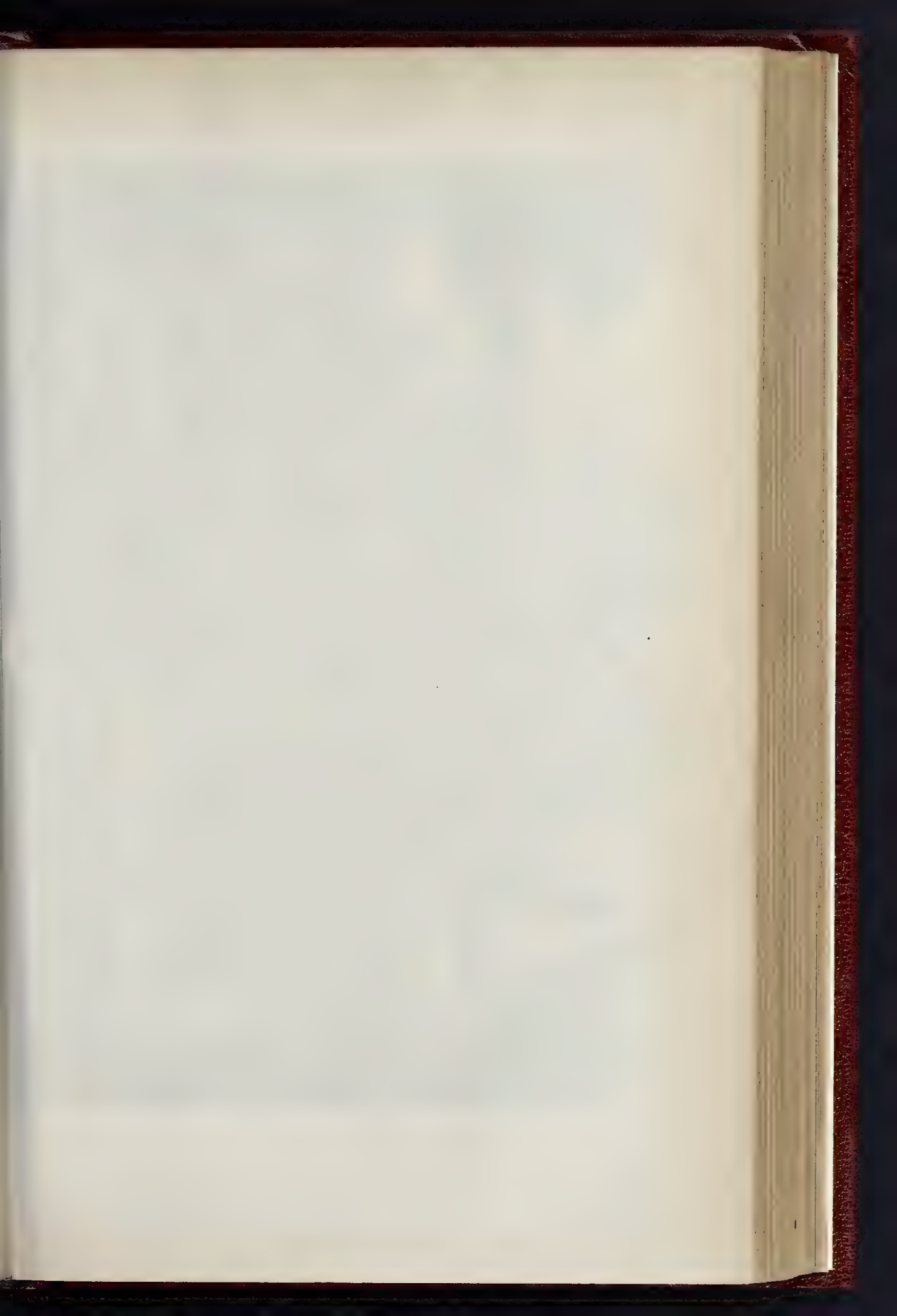




THE HALL OF HEROES, IN THE ARSENAL, VIENNA.







THE BUILDER, APRIL 15, 1882.







Whitman & Bass Photo Litho. & Engraving

Wymon & Sons Printers & Queen St

BUSINESS PREMISES IN LIVERPOOL.—MR. B. H. STONE, ARCHITECT.





often brought forward and quoted as justifications for stepping over the bounds of common sense. But we are not all capable of feats of ingenuity. We cannot all swallow swords or dance on ropes. In the scientific world experiments are, I believe, made in private, and not until what seems to be their truths have been ascertained are they brought forward publicly. In the artistic world so strict a practice does not, I think, prevail. Very vile artistic experiments,—experiments in the truest sense of the word,—are displayed in public, and this public exhibition of them seems to hallow them with a sanction of merit.\*

#### THE NEW UNITED WESTMINSTER ALMS-HOUSES.

THE ancient alms-houses in Rochester-row, Westminster, opposite St. Stephen's Church, known by the designation of the Emery Hill foundation, have just been rebuilt, in consequence of the old buildings having fallen into a state of dilapidation and decay. In the re-erection of the buildings an arrangement has been carried out by which the several alms-house foundations in Westminster are now brought together on one site in Rochester-row, the site of the Emery Hill buildings having been extended for the purpose. Under the name of the United Westminster Alms-houses, they will include the Emery Hill, the Butler, and the Palmer foundations, the old buildings belonging to the last-named charity, off Victoria-street, having been purchased and taken down in order to clear the site for the Army and Navy Hotel.

The buildings consist of a central portion, and two side blocks or wings, being in the form of a quadrangle. The two side blocks have each a frontage to Rochester-row, of 44 ft., extending in depth to 99 ft. 6 in. They are two stories in height, the Rochester-row frontages of the wings being surmounted by ornamental gables, under which there are niches containing busts of Emery Hill and Palmer, two of the founders, that of Emery Hill being placed in the south wing, and that of Palmer in the north wing. In close proximity to the niches there are also slabs, recording the dates of the foundations of the several alms-houses, the spelling and characters in the inscriptions being closely copied from similar original slabs as they appeared on the face of the old buildings. The frontages of the wings overlooking the open area within the quadrangle are also each surmounted by six gables. Each wing contains twelve houses, consisting of living-room, bed-room, scullery, coal-store, and conveniences. The central block at the rear of the quadrangle is 76 ft. in length, and 39 ft. in depth, and is carried to a height of upwards of 50 ft., having three pediment dormers in a high-pitched roof. Above the roof, in the centre, rises a belfry. In addition to the alms-houses, this block contains the master's residence, spacious board-room, nurses' rooms, wash-house, laundry, and infirmary. The buildings are in the Queen Anne style of architecture, the materials consisting of red brick facings, and Broseley tile roofs. The entire length of the Rochester-row frontage, including the open area, is 225 ft.; the buildings and grounds covering an area of about 23,000 superficial feet.

The buildings were designed by the late Mr. Arntz, of Victoria-chambers, Westminster, and since Mr. Arntz's death they have been carried out by Mr. Cole Adams, of Holden-terrace, Grosvenor-gardens. Messrs. Adamson & Son are the contractors, and Mr. T. Higgs is clerk of the works.

**Association of Municipal and Sanitary Engineers and Surveyors.**—The Northern District Meeting is to be held at Sunderland, on Saturday, the 22nd of April. The following papers, we learn, will be read and discussed:—"Street Lighting of the Future," by Mr. W. G. Laws, Borough Surveyor, Newcastle; "Private Improvement Apportionments," by Mr. Jas. Hall, Borough Surveyor, Stockton; "The Canal Boats Act," by Mr. E. C. B. Tindor, Surveyor, Local Board, Goole. During the day various works will be visited.

\* The various specimens exhibited were lent by H. R. H. the Princess Christian, Lady Marian Alford, Lady Lyndal, Mrs. Bayman, Mrs. Alan Cole, Lord Middleton, Mr. Montague Guest, M.P., the Committee of the Royal School of Art Needlework; photographs and reproductions of Italian pattern-books were lent from the South Kensington Museums; and diagrams of stitches were made by students at the National Art Training School at South Kensington, through the kindness of the principal of the school, Mr. John Sparke.

#### RELICT OF THE LATE SIR CHARLES BARRY, R.A.

WE hear, with much personal regret, of the death of Lady Barry, in the eighty-third year of her age, at her residence, 8, Cleveland-square, Hyde Park. In years gone by, when Sir Charles Barry was alive, and occupied a well-known house on Clapham Common, we remember Lady Barry the centre of a circle of love and brightness. For some few years past Lady Barry has been, so to speak, out of society; but she had previously the satisfaction of seeing her children, and relatives on her own side, taking prominent and honourable positions in the world, and well maintaining the high reputation which had been created by her distinguished and admirable husband.

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

VISIT TO HAMILTON PALACE.

By special permission, a party, limited to twenty members of the Association, headed by their president, Mr. John McLauchlan, had an opportunity of inspecting the art-treasures at Hamilton Palace on the 1st inst. The party were met on their arrival at Hamilton by Messrs. George and R. H. Paterson, who accompanied them on their tour of inspection of the magnificent collection of pictures and articles of *virtu* contained in the princely galleries of the noble mansion. Among the objects which specially excited the admiration of the visitors were the family portraits, the pictures by Rubens, Vanduyck, Leonardo da Vinci, and other celebrated old masters. Much admiration was expressed on beholding the magnificent vases, cabinets, tapestries, art furniture, and other decorative objects. Having expressed to the housekeeper the gratification afforded by the visit and thanks for her kindness in acting as *cicerone*, the party proceeded to inspect the mausoleum. The interior as well as the exterior of this massive structure was considered worthy of careful examination. On the invitation of Mr. John Watson, of Earnock and Nisland, the party drove to Earnock, where they were received by Mr. Mitchell, commissioner for Mr. Watson, who showed them over the new mansion-house (now in course of completion), stables, Swiss outgate, and other picturesque sights on the estates. The company afterwards dined together in Spalding's Hotel, Hamilton, and returned to Edinburgh highly gratified with the proceedings of the day.

#### HOUSES IN CYPRUS.

I HAVE thought the accompanying communication as to how the houses are built and planned in Cyprus might be interesting to some of the readers of the *Builder*, and therefore I have the pleasure of sending it to you.

Throughout Cyprus there is an abundance of limestone rock and also of clay of a plastic nature: of these materials, with the addition of wood, the houses of Cyprus are built.

The length and size of the wood which is used for rafters and floors, govern very much the mode of construction. This wood, I am informed, was procured, to a great extent in the island, and is of a very resinous character. The disforestation of the island has, however, been stopped, and it is now procured from Asia Minor, the coast of which is about sixty miles from the north side of the island, and the mountains are plainly discernible from thence. It is imported in lengths about 13 ft. long and 6 in. diameter: the bark is removed, resembling very much our scaffold-poles, only not so long. The colour is about the colour of pitch-pine, and the surface glossy. The pine used, I am informed, is the *Pinus maritima* Lambertii, and is evidently very durable, for in houses of old construction I have observed, when used for roof construction and projecting considerably beyond the walls, the weather does not appear to produce any action upon the projecting ends of the timbers. I have seen also large square pieces of timber, but in a country where there are no carriage roads it must necessarily be very difficult to transport, and therefore it is only rarely used.

Now, given these short lengths of small timber, the next step is how to support them. This is done by wonderfully well-constructed stone arches, which are built some 10 ft. to 12 ft. apart, just sufficiently far apart to carry

the poles. These arches are really bold pieces of construction. The abutments are of the slightest description, and the arches are not unfrequently 20 ft. span or more, and sometimes not more than 6 in. thick. All the arches are pointed. They generally spring only a few feet above the floor-line. The stones are about 12 in. or 13 in. deep, and are put together with the simplest appliances. The stones are bedded in gypsum. First the springing stones are laid without centre as high up as they will hold together, then a stage is formed on which are placed two boards, representing the chord of the arch, and on this the arch is built. The cost of the labour in cutting the stones and building the work is one shilling per foot span. Over the poles or joists to form the floor there is then laid a thick matting, formed of reeds, and very similar to the Indian matting we use in England. The reeds are woven together, usually forming a pattern of small squares, in each square the reeds running at right angles to those in the square adjoining thus:—



The matting is so strong as to lie quite flat between the rafters, which are about 6 in. apart, and on this, to form the floor, a layer of sea-weed or shavings is placed, and over that a layer of earth or clay, and then thin squares of marble, or rather alabaster, about 1 in. thick. This material admits of being cleaved without difficulty. It is easily sawn with an ordinary saw, the joints are quite close, and I am informed for good work that it is planed with a joiner's plane, and when finished it presents a smooth polished surface.

For the roof the poles which form the rafters are laid with a very slight fall. They are then covered with matting in the same way as the floor, and over this with clay incorporated with small pieces of straw to a thickness of about 6 in. I found the surface, after rain, is soft; but the rain does not penetrate, and it forms a waterproof covering. The roofs towards the eaves or lower part of the slope are generally formed into rounded ridges or furrows; and at intervals of about 6 ft. earthenware spouts are bedded, which project like gargoyles, and convey the water sufficiently far off to prevent splashing the walls.

The ceiling of the rooms is formed by the poles, which have a polished surface, and the flat matting which is seen between; but in the bettermost houses, several of which I saw at Nicosia, which is the capital of the island (and I believe there are others to be seen in the monasteries), the ceilings are formed of wood, with very ingenious arabesque patterns, formed by moulded slips of wood in relief laid on the flat boarding. The external walls are sometimes made of masonry; but where this is so it is generally of ready-worked stones taken from old buildings, and of which there appears to be an abundant supply throughout the island; but when no such supply does exist, then of sun-burnt bricks composed of clay and shreds of straw, not chopped, but drawn into shreds by a peculiar harrow used for the purpose. The size of some of the bricks I measured was 18 in. by 12 in. by 3 in. thick. They are bedded in clay, and are not so hard but that they are capable of bending when laid, so as to adapt themselves to any irregularity of the surface of the bed.

When the walls are thus finished they are plastered inside, and sometimes outside,—generally, however, this is not the case,—so that the light-brown-coloured walls are hardly different in tone from the hill sides which form their background; and were it not for the black shadows of the eaves, window, and door openings, the villages would hardly be distinguishable at a little distance. Such is the principle on which the houses are constructed. And now as to the finishings.

The floors, as before stated, are formed of thin slabs of stone or (more generally) alabaster. The plastering on the walls, which is very good, extends from floor to ceiling. In the villages and least expensive houses there are no casements or sashes,—shutters only,—hung on wooden frames. The window-board is stone; the jambs and soffits are sometimes lined with wood, sometimes not. The joiners' work generally is about 1 in. thick; the shutters are matched, and moulded with a delicately-shaped mouldings, and ledged. The fastenings to doors and windows consist of a wooden catch fixed to the soffit of the opening by a nail.




The head of the frame is rebated sufficiently to enable the catch to be lifted up so as to clear the door or the shutter-head, and it is opened from the outside either by placing the finger in a hole formed in the door-head, and lifting the catch, or by raising a ring placed outside the door, which is connected with a vertical rod inside the door, the lifting of which raises the catch.

In the better houses there are glazed sashes or casements; but these are also only about 1 in. thick. Casements are fastened in the middle by a vertical bar hung on a centre or pin half way up its height, which bar closes over the meeting-rails of the casement, and is locked into a top and bottom socket; but some of the more modern and best houses have casement-fastenings of French manufacture.

The hinges are of the most ordinary description, in small doors being formed of wire.

Where the windows are not made as casements they slide up into a cavity formed to receive them above the sash. They are not hung, but metal catches are placed on the casement, which may be pushed into holes in the frame, and so retained open at any required height.

In the towns the windows have outside blinds; the modern ones are wooden Venetian blinds, painted the conventional green colour. In the older houses the outside blinds are sometimes made to slide up into a cavity, as the sashes, but more generally, are fixed with the lower part hinged half-way up, so as to open outwards. These, particularly in the Mahomedan houses, are formed of close trellis pattern, so close that those inside may see out, but cannot be seen by passers-by outside.

The sashes are so put together that they may be pulled to pieces to admit of broken glass being replaced, for no putty is used in the glazing,—the sash-bar, which is rather wide, being grooved to receive the glass. The vertical bars generally do not come over each other, but are formed thus:—  
  
This, I apprehend, is done to preserve the strength of the horizontal bar by not mortising it quite through, and it appears also to be done simply to bring in a piece of glass of some special size. The sash is taken to pieces by removing the lower rail, which is simply halved into the side vertical bars and pinned with a wooden pin. This being done, the sash is easily taken to pieces.

The doors, as the windows, are generally ledged, moulded outside; but in the better houses they are, on the inside, much more elaborately made, being formed in small panels, and in some cases in the Louis XV. style. The doors are often made in two folds, and frequently so low that it is necessary to stoop in order to enter, which is difficult to account for with a race of people who are certainly not short in stature.

The houses, of course, are of various sizes. The smaller houses have an arcade in front, and are one room deep. If more than one room is required it is obtained by lengthening the house. Except in the towns the houses are seldom more than one story high, and the stairs to the upper story are formed outside the house, generally of stone, and steep. In the towns the ground-floor appears to be chiefly used as store-rooms, the living-rooms being on the first floor. There are no fireplaces in any of the rooms, except in that required for cooking, which consists of a raised hearth with a hood over it, having an outlet just through the wall to allow the fumes of the fire to escape. Any warming of the rooms is by braziers or rude earthenware substitutes. The fuel used is charcoal. Thus, there are no chimneys, and no smoke is visible. Outside the houses ovens are frequently found. In the better houses there is usually a bath, more or less extensive, generally two rooms only, with the heating apparatus outside. In one small town on the north coast,—Kyzenia,—I observed a bath consisting of three chambers, used in common by all the Moslem inhabitants, who pay a small fee (one piastre, a little more than 1d., I was informed), and when in use by the women, a shawl is suspended outside the entrance door, which excludes the men.

Beginning with the simple form of house of one or two rooms, there are, of course, houses much more elaborate in form. In the Moslem houses there are two divisions,—one for the men, another for the women.

I append a plan of a house in Nicosia, the capital of the island, formerly the residence of a wealthy Turk, which illustrates the arrangement and distribution of Turkish houses. It shows the division of the house into two, with separate entrances from without, separate courtyards and gardens. The rooms on the first-floor are lofty, with windows all round; the upper windows seem to be for the purpose of ventilation only. In each house there is a spacious gallery of communication and an external open gallery. On the women's side is a central hall, forming part of the gallery of communication, which projects beyond the body of the building, thus commanding a view up and down the adjoining street; and this overhanging projection, with windows on three sides, like a large bay-window, is one of the characteristic features of all the bettermost houses. By the plan it will be seen that the male and female sides of the house are separated by a wall, in which there is only one door, and an opening in which is placed a circular turn-table to pass the cooked food from the women's to the men's side of the house.

There is also a door from the pasha's private room leading on to the outer gallery of the women's apartment; and the windows of the room also overlook the courtyard and garden on the women's side.

The central hall on the women's side is surrounded by their sleeping apartments, from the side windows of which it is overlooked, so that dancing or other amusements carried on there may be seen from the women's adjoining apartments.

In some of the bettermost houses I visited at Nicosia, I found the chief room in the house handsomely decorated, and divided into two parts; that at the entrance is about 6 ft. wide; the other or upper part of the room is raised one step. The walls are sometimes panelled, but whether panelled or not, at about 7 ft. from the floor is a cornice and shelf, on which are placed any decorative objects of value, and the ceiling, if of wood, is decorated by somewhat intricate patterns formed by interlacing fillets of moulded wood.

It is rare to see windows on the ground-floor, and if the rooms cannot be lighted from the street, they are lighted from the inner courts or gardens, as, although there seems to be no law on the subject, the Moslems are extremely jealous of having windows formed so as to overlook their adjoining land.

EDWARD PANSON, F.R.I.B.A.

#### THE HALL OF HEROES, IN THE ARSENAL, VIENNA.

THE Imperial Arsenal at Vienna was placed on the highest point of the city, to the rear of the Belvedere, commanding the capital in all directions, for military reasons which were weighty at the time of its erection (after 1848), but which have now no further value. At that time Vienna was still considered a fortress; and on the other hand, the fortifications were intended to be used also, in case of need, against the inhabitants. It thus happened that the arsenal was originally designed to be a fortified town by itself, and provided with all the adjuncts of such a place, barracks, workshops for preparing food and manufacturing carriages and arms of all descriptions, cannon foundries, railways, church, and museum with a "heroes' hall," its total area being no less than 168 acres.

The barracks and workshops, inevitably buildings of a monotonous character, erected in brick, enclose in their exterior, like a pearl in a shell, the "museum." The plans for the arsenal were drawn up by the architects Siccardburg and Van der Nüll, who for some years previously had designed all the larger public buildings of Vienna. They were assisted in matters of detail by the architects Rösler, Förster, and Hansen. To the latter the museum is indebted for its sumptuous Mauresque style of architecture, and while externally a plain brick building, in its interior it develops a mass of picturesque and finely membered details, which, because unexpected, create not a little surprise. From a large vestibule, supported by dark pillars, and in which fifty-two statues in white marble are placed upon pedestals, access is gained by marble stairs to the first floor, occupied by the Ruhmeshalle or Heldensaal (Hall of Heroes). In the vestibule, two remarkable pieces of ordnance,—a breech-loader of the sixteenth century, and a leather cannon surrounded by an

envelope of brass, a trophy of the Swedish war,—attract attention. The vestibule contains allegoric frescoes by Rahl. The large paintings in the Heroes' Hall, by Karl Blas, which meet the eye on entering, remind us at the same time that we have here the decision of an art battle, fought stubbornly for some time between allegory and reality. The emperor decided at last that, instead of to Mars and Jupiter Tonans, &c., the wall-spaces should be devoted to the representation of personages renowned in Austrian history, such as the emperors Rudolf and Maximilian, Prince Eugenius, Laudon, Archduke Charles, &c. The frescoes by Blas which fill the spandrels and panels form an eloquent pictorial history.

The Heroes' Hall (which we illustrate in our present number) has three cupolas, one large one in the centre, a small one in each wing, separated from each other, and at the same time joined by a double row of slender pillars. The view to the right and left is charming. The statues illustrate, for the most part, recent Austrian history, and Radetzky occupies the place of honour. Three glass bells, supported on appropriate pedestals, contain,—that in the centre the trophy presented to Admiral Tegethoff by Trieste, the two others the marshal's baton of Prince Radetzky, and the cup of honour which the Austrian army gave to the poet Grillparzer for his poem, "In deinem Lager ist Oesterreich." As a matter of course, there is in the museum a valuable collection of trophies and arms. The whole museum has been historically arranged, with much labour, by its present director, Quirin von Leitner. A large portion of it, especially arms, is the private property of the emperor. Artists, men of letters, and antiquaries will find here a great treasure in a splendid shrine.

#### BALHAM HOUSE, BALHAM HILL.

THIS house has recently been rebuilt for Mr. Jas. Maden Holt. The walls are faced with gauged yellow malm bricks, with Portland stone dressings. The principal joiners' work is in pitch-pine, moulded, carved, and French polished. A marble mosaic floor is laid to the entrances, and the columns and pilasters throughout are in Devonshire marble. The principal staircase is 7 ft. 6 in. wide, and the steps and landings to this and to the other staircases are in blue Bamley stone. The strings, balusters, and handrails are of pitch-pine, carved, and French polished. The Baths are in porcelain (Finch's patent).

The whole of the rooms and offices in the basement are paved with Wilkinson's patent paving. The house is warmed throughout by hot-water coils. Electric bells, thief-alarms, speaking-tubes, and hot-water pipes are laid throughout the house.

The house has been built and decorated by Messrs. Trollope & Son, from the designs of Mr. J. T. Smith, of 19, Parliament-street.\*

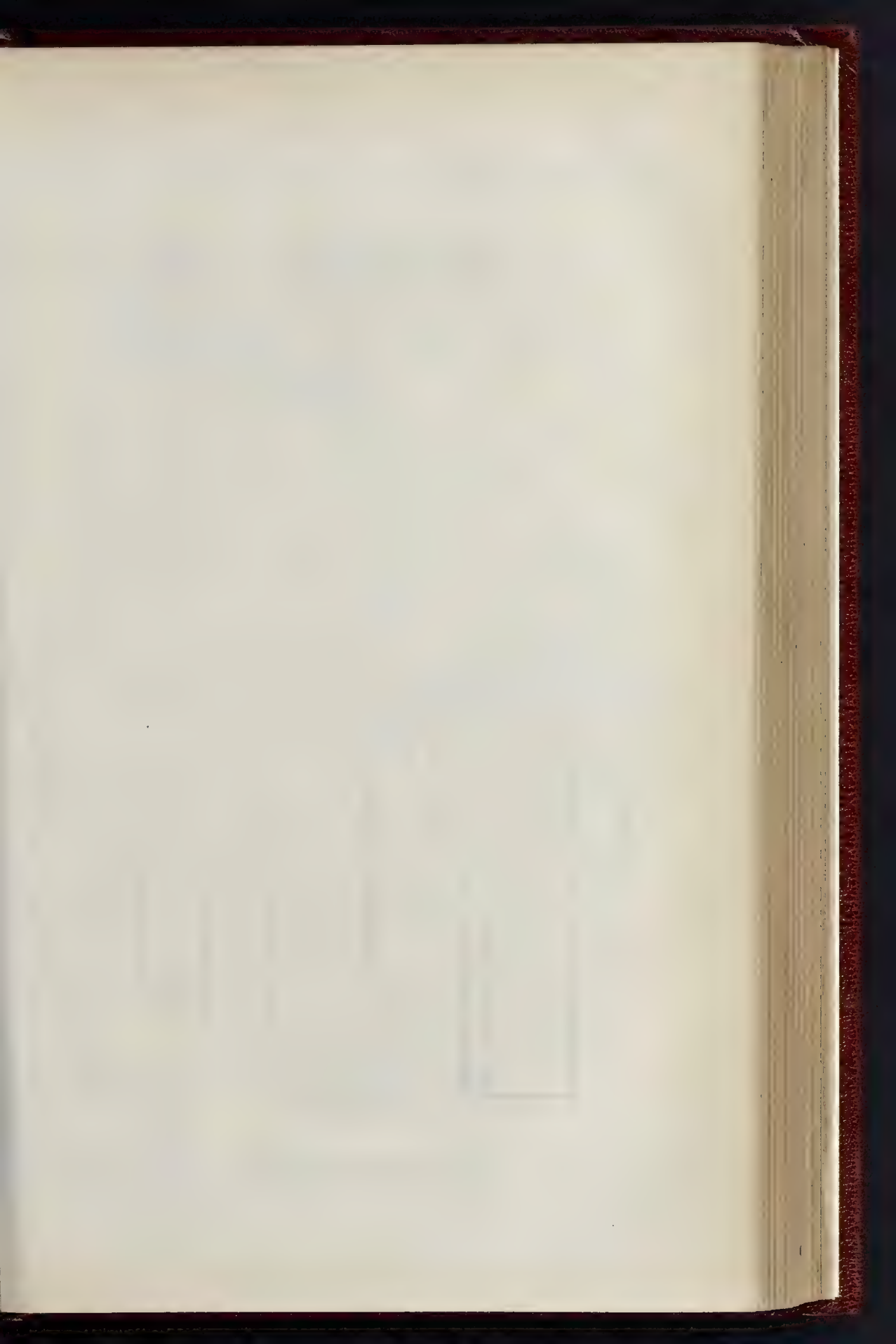
#### BUSINESS PREMISES, LIVERPOOL.

THESE premises are about to be commenced, for Messrs. Bird & Sons, in Liverpool. On the ground-floor is a spacious shop, with a show-room at the back, lighted from the roof. The first floor is one large show-room, lighted back and front, with private offices, &c. The second and third floors are offices to be let, with a separate entrance from the street. The materials to be used externally are white brick and stone dressings, with terra-cotta panels. Mr. B. H. Stone is the architect, and the tender of Mr. James Brown to execute the work has been accepted.

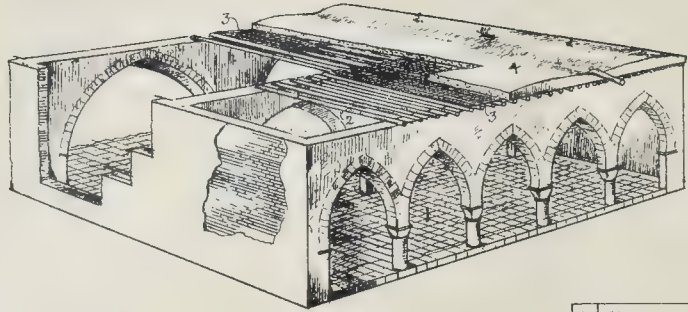
**The New River Company.—Sale of an Adventurer's Share.**—Last week, at the Auction Mart, Messrs. Farebrother, Ellis, Clark, & Co., submitted for sale one quarter of an Adventurer's Share in the New River Company. The property was divided into twenty-four lots, the whole of which, with three exceptions, fell into the hands of one purchaser, each lot realising 1,000l. The total produce of the sale amounted to 24,000l., which is almost the nominal value of a full share,—25,000l. The price at which the property was sold represents 98,000l. per share, or 71,000l. premium.

\* We shall give in an early number plans of the house, together with those of another building by the same architect.



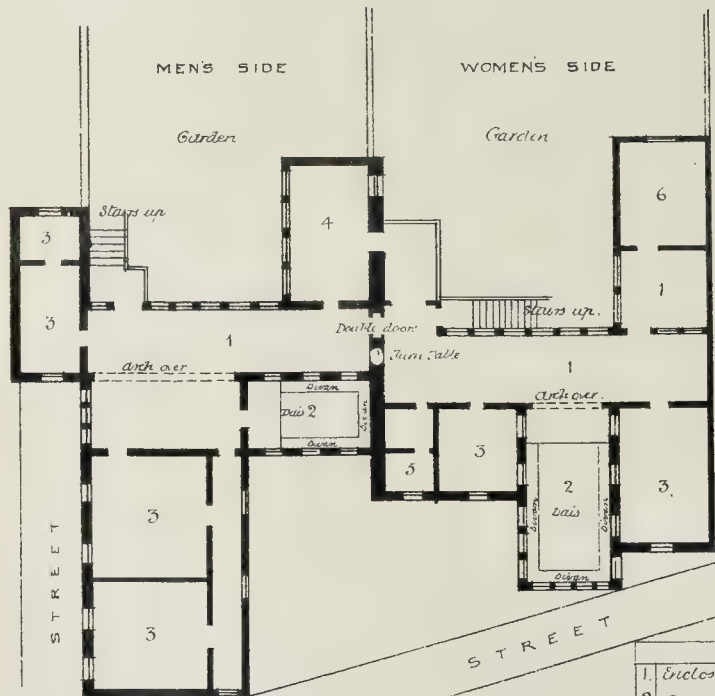


*A Cypriote House.*



- |    |               |
|----|---------------|
| 1. | Stone paving  |
| 2. | Stiles        |
| 3. | Thick Matting |
| 4. | Clay Roof.    |

*A Mussulman's house at Nicotia.*

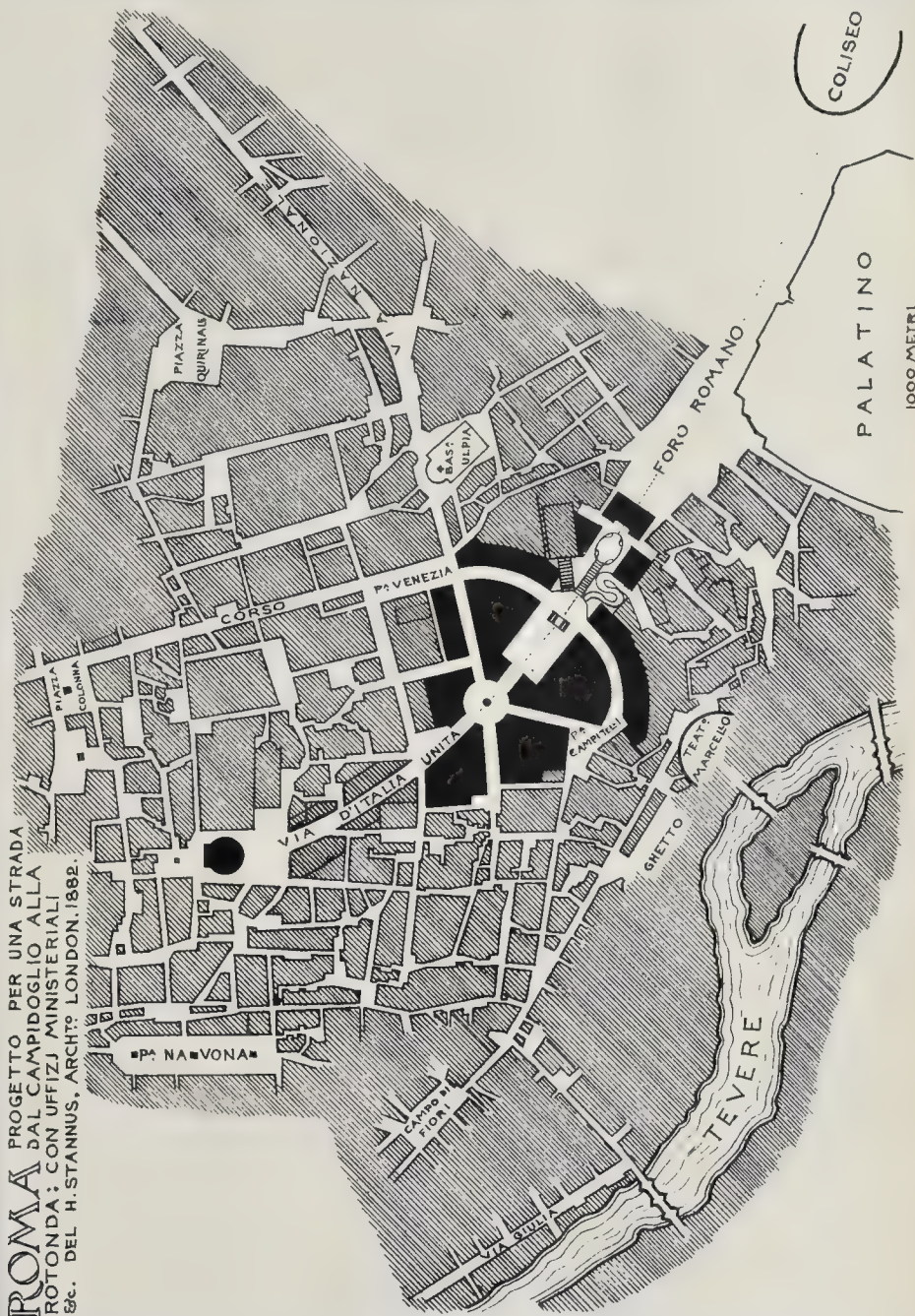


*Plan of First or Principal Floor*

- | References. |                      |
|-------------|----------------------|
| 1.          | Enclosed Corridors   |
| 2.          | Reception Rooms      |
| 3.          | Bed Rooms.           |
| 4.          | Pasha's Private Room |
| 5.          | Ablution Room        |
| 6.          | Kitchen and Seneents |



**ROMA** PROGETTO PER UNA STRADA  
DAL CAMPIDOGLIO ALLA  
ROTONDA: CON UFFIZI MINISTERIALI  
Etc. DEL H. STANNUS, ARCHTº LONDON. 1882.



Arch. Stannus

1882





## STREET IMPROVEMENT IN ROME:

IN CONNECTION WITH THE VICTOR EMANUEL MEMORIAL.

I READ your account of the competition for the memorial to the late King with much interest, and as a further contribution on the subject I enclose a plan, drawn out a little time ago, for improving some of the thoroughfares in the Eternal City. This was the result of thought both during my stay at Rome and since; and if it comes within the usual scope of your illustrations I should be glad if you would publish it, as it might thereby elicit opinions and suggestions from others who have been struck with similar ideas when on the spot.

My project consists of three suggestions:—(1) To form a crescent (to be named "Via del Capitol") commencing at the south end of the Corso by the Piazza Venezia, passing the steps of the Campidoglio, and communicating at its other end with the Via de' Falegnami at the Piazza of Sta. Caterina de' Funari. (2) To widen the present crooked and ill-paved Via di Araceli, and to continue the street to the Pantheon, forming a Piazza (to be named "Piazza del Mausoleo") in the rear where the vestibule has been lately discovered by the Via Palombara: the white street from the Capitol to the Pantheon to be named "Via d'Italia Unita." (3) To continue the Via Nazionale along the line of the Via Magnanapoli, the Via S. Marco, and the Via di Botteghe-oscuire, widening these on the south side, and continuing the first name throughout the entire length from the Piazza delle Terme to the little Church of Sta. Lucia in the last-named street.

It will be seen from the plan that the "Via d'Italia Unita" would cross the crescent, and that it might at that point be spanned by a triumphal arch, fronting towards the Capitol, as shown. It would also cross the continuation of the Via Nazionale, and the radiation of Via here would make a fine position for a memorial column or any monument of a similar circular plan.

As regards sentiment (which is a strong factor in these questions), the crescent would form a natural connecting link between the modern Corso at one end and the Papal part of Rome at its other, while its centre would touch the Capitol which typifies the ancient greatness. Again: the "Via d'Italia Unita" would make a connecting street from the Capitol to the tomb of the first king of United Italy, and thus the threads of Italian history,—the Flavian Colosseum, the Forum, the Capitol, the Mausoleum, with the railway-station through the Via Nazionale, the Trastevere over the Ponte Sisto, the Pope's Rome through the Via Giulia,—the Ancient, the Medieval, the Renaissance, and the Modern,—would be all gathered together, and their interest focussed at the small circular Piazza shown on the plan.

On the score of utility: the importance of connecting the Via Nazionale with Trastevere, the necessity of opening out the end of the Corso by joining it with the Campidoglio and the doing away with the Ripresa de' Barberi will be admitted. The new streets would give ample opportunities for Houses of Parliament and all departments of the Government and the Municipal offices which are not yet provided for. The new buildings on the outer side of the Crescent would mask the present ugly view of those which flank the Capitol and the Araceli, leaving a fine vista of these latter in the centre. The alleys in this neighbourhood are much congested, and a wide boulevard would greatly relieve the traffic; they appeared to be somewhat low in character, and would be all the better cleared away, while the chance of concentrating the Government and other offices is worth consideration. Also it will be noticed that if the new street from the circular Piazzetta to the Campitelli be diverted at its lower end, a little towards the east, for the purpose of avoiding the Church of the Campitelli, it could be continued through the Piazza Montanara alongside the remains of the Theatre of Marcellus to join the Via di Bocca della Verità; thus forming another useful wide street through a miserable neighbourhood to the Tiber side of the Palatine.

The above suggestions would destroy no historical antiquities (I lay stress on this); they would, on the contrary, give chances of finding further traces of Imperial Rome. The important buildings which would be affected are, a portion of the Pal. Antonelli, at the present end of the Via Nazionale, to be set back; the east wing of the Pal. Venezia to be

set back to align with the Piazza, but the Church of S. Marco not to be touched; the south-west facade of the House of the Gesù to be set back (?), but the Church of the Gesù not to be touched; and the small Palazzo Strozzi, by Sta. Caterina de' Funari, to be removed, but this is of no value either historically or aesthetically.

The whole project works out so well on paper that a suspicion might be raised as to its having been "cooked"; hence I beg to say that the neighbourhood has been scrupulously traced from a large map of recent date.

Though it was primarily evolved along the lines of utility, it would give opportunities for fine buildings and noble monuments, all above the level of inundations. The cost would not be great, as the neighbourhood is poor and the property must be cheap; and this need not be an obstacle, as the work could be carried out in the three separate sections. If so, of course, the main Via to the Tomb would be considered as the memorial of the great Re Galantuomo.

HUGH STANNUS.

## SEETHING LANE.

ANOTHER portion of Old London is disappearing. Just within the eastern line of the wall of London, and in close proximity to Great Tower Hill, the "bad eminence" on which so many of the great and good of this realm have been done to death by the hands of the executioner, and extending from All Hallows Barking Church, in Tower-street, to St. Olave's Church, in Hart-street, is the lane which, according to Stow, was formerly known as Sydon-lane, "now corruptly called Sything Lane." [In a grant of Edward III. to the Prior of the Holy Cross, it is termed Sydene Lane.] In this Sydon Lane divers fair and large houses are built, namely one by Sir John Allen, some time Mayor of London, and of Counsell until King Henry the Eighth; Sir Francis Walsingham, principal secretary to the Queen's Majesty that now is [Elizabeth] lodged there," and died there on the 6th of April, 1590, at midnight, and on the night following his friends, and they were few, fearful lest his corpse should be arrested for debt, buried him in St. Paul's without solemnity. In the account of this hurried interment, the lane is called Seething-lane. In the same year, 1590, Robert Devereux, Earl of Essex, married the widow of Sir Philip Sidney, and daughter of Sir Francis Walsingham, and entered into possession of the mansion in Seething-lane, which afterwards became the property of the Lumley family. In "A Collection of Names of the Merchants living in and about the City of London, licensed October 11, 1677: Roger L'Estrange," only two merchants are mentioned as residing in the Lane; and Strype, writing of it in 1720, says "it is now a place of no great account; but,"—by a desire on the chronicler's part to keep up a little of its ancient dignity,—"amongst the inhabitants some are merchants." In "A Complete Guide to all Persons who have any Trade or Concern with the City, &c.," which appeared in 1740, the number of merchants residing in the Lane shows an increase during the foregoing twenty years; and in Kelly's "London Directory" for 1882, the names of merchants in the Lane, and its alleys and courts, may be counted by the hundred.

Huge blocks of buildings dedicated to trade and commerce occupy nearly all the sites of the once "fayre" dwelling-houses, and very little of the Seething-lane of two centuries ago is left. A large extent, front and back, of the portion on the west of Tower-street end has lately been doomed by inevitable improvement, and is in process of demolition. Still, throughout, and notwithstanding all these changes, the lane will ever be haunted by the shade of Samuel Pepys, Clerk of the Acts of the Navy.

In 1584 the chapel and college attached to the Church of Allhallows, Barking, were pulled down, and the ground was utilised as a garden during the reigns of King Edward VI., Queen Mary, and part of Queen Elizabeth's, until Sir William Winter, surveyor of the queen's ships, built up of timber and brickwork a storehouse for merchants' goods brought from the sea. Lumley House, originally the residence of Walsingham, was pulled down, and on its site rose the Navy Office, Winter's "large, strong frame of timber and brick" made way for the courtyard of the office, a representation of which is given in a plan of the Tower Ward in Strype's "Stow." A very plain building it seems to have been. It was, however, very commodious, and here

the Commissioners met, and the several clerks kept their books, which were placed in the midst of a large court, apart from the rest of the buildings round about it to avoid loss or damage by fire.

In January, 1660, Samuel Pepys, along with his wife and servant Jane, lived in a garret in Axe-yard, Westminster, which in 1768 changed its name to Flindery-street, and at that time was mainly dependent on the bounty of Sir Edward Montague. In the summer of 1660 Montague was rewarded for his services to King Charles II. with the earldom of Sandwich, and made keeper of the Great Wardrobe and Clerk of the Privy Seal, and he forgot not Pepys, who was immediately afterwards nominated Clerk of the Acts of the Navy. Pepys and his wife go on a house-hunting expedition; for his abode in the west did not become the dignity of his official position, and was also too far distant from the scene of his new labours. Their hunt is brief and successful. On the 15th of July, 1660, Pepys records:—"My wife and I mightily pleased with our new house that we hope to have." In three days after they enter on possession. "July 18, 1660. I dined at my house in Seething-lane." One of the entrances to the Navy Office was in Seething-lane, whence also there was access to St. Olave's Church, of which congregation Pepys was an exemplary member. "November 4th, 1660, Lord's Day. In the morning to my own church [St. Olave's], . . . My wife seemed very pretty to-day, it being the first time I had given her leave to wear a black patch." Many references does Pepys make in his Diary to St. Olave's. One more must suffice here. There is a rumour on the morning of June 6th, 1666, that the terrible Dutch fleet has been defeated. Pepys sets forth westward from Seething-lane, and after a forenoon of inquiries, that result in a confirmation of the rumour, "So home to our own church, it being the common fast-day, and it was just before sermon; but, Lord, how all the people in the church stared upon me, to see me whisper [the news of the defeat] to Sir John Mynnes and my Lady Pen,"—patriotic Pepys! but,—

"but what pleased me as much as the news was to have the fair Mrs. Middleton at our own church, who is, indeed, a very beautiful lady." Pepys had an anxious and busy time during the Fire of London, the spreading of which he did so much to check by employing the men from the naval dockyard to blow up the houses round the fiery circumference. "September 6, 1666. About two in the morning my wife calls me up and tells me of new cries of fire, it being come to Barking Church, which is at the bottom of our lane." Saving his money and valuables is the work of the morning, and necessitates his going down to Woodwich. "Home, and whereas I expected to see our house on fire, it being now about seven o'clock, it was not." The Navy Office is the next object of solicitation. From his record we may guess his feelings as he hurried up the lane. "I durst not ask anybody how it was with us." As the day wears on he discovers the fire has not touched the lane,—not quite,—it had "only burned the dial of Barking Church, and there was quenched. I up to the top of Barking Steeple, and there saw the saddest sight of desolation that I ever saw. . . . I became afraid to stay there long, and therefore came down again as fast as I could."

Pepys removed from Seething-lane in 1669, at which time he concluded his Diary. He died in 1703. "Yesterday, in the evening, were performed the obsequies of Samuel Pepys, esq., in Crutched Friars [St. Olave's] Church."—*Post Boy*, June 5, 1703. Dr. Hooke, under same date, writes to a friend, "Last night, at nine o'clock, I did the last office for your and my good friend, Mr. Pepys, at St. Olave's Church, where he was laid in a vault of his own making by his wife and brother."

In the reign of William III. the chief business of the Admiralty was removed from the old Navy Office to Whitehall, and what remained, to Somerset House, as soon as Sir William Chambers, the architect of the latter noble building, was ready to receive it.

What a change has passed over Seething-lane in three hundred years! Sir Philip Sydney, the "Astrophel" of Edmund Spenser, strolling pensively along the Lane in the summer of 1582, to woo and win Frances, the fair and only daughter of Sir Francis Walsingham, the trees and gardens around him filled with the singing of the birds. And now, not a green leaf, not a bird,—save the irrepressible and timeless sparrow,—no "fayre houses," but tall buildings



blackened with smoke, crowds hurrying hither and thither intent on business, and over all, the rattle of the wagon and the shouting of its driver.

### THE GAS ENGINE.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, the 4th of April, Mr. Brunless, vice-president, in the chair, the paper read was "On the Theory of the Gas-Engine," by Mr. Dagald Clerk.

The practical problem of the conversion of heat into mechanical work had been partially solved by the steam-engine; but its efficiency was so low that it could not be considered as complete or final. Hot air in the past had been looked upon as a possible advance. Owing, however, to many futile attempts, it had long been deemed useless to look in that direction for better results. The great progress made in recent years with the gas-engine, from the state of an interesting but troublesome toy to a practical, powerful rival of the steam-engine, had shown that air might, after all, be the chief motive power of the future.

Three distinct types of gas-engines had been proposed:—

1. An engine drawing into the cylinder gas and air at atmospheric pressure for a portion of its stroke, cutting off communication with the outer atmosphere, and immediately igniting the mixture, the piston being pushed forward by the pressure of the ignited gases during the remainder of the stroke. The in-stroke discharged the products of combustion.

2. An engine in which a mixture of gas and air was drawn up in a pump, and was discharged by the return stroke into a reservoir in a state of compression. From the reservoir the mixture entered a cylinder, being ignited as it entered, and without rise in pressure, but simply increased in volume, and following the piston as it moved forward; the return stroke discharged the products of combustion.

3. An engine in which a mixture of gas and air was compressed or introduced under compression into a cylinder, or space at the end of a cylinder, and then ignited while the volume remained constant, and the pressure rose. Under this pressure the piston moved forward, and the return stroke discharged the exhaust.

Types 1 and 3 were explosion-engines, the volume of the mixture remaining constant while the pressure increased. Type 2 was a gradual combustion-engine, in which the pressure was constant, but the volume increased. Calculating the power to be obtained from each of these methods, supposing no loss of heat to the cylinder, it was found that an engine of type 1, using 100 heat units, would convert 21 units into mechanical work; in type 2, 36 units; and in type 3, 45 units. The great advantage of compression was clearly seen by the simple operation of compressing before heating, the last engine giving for the same expenditure of heat 2.1 times as much work as the first.

Compression made it possible to obtain from heated air a great amount of work with but a small movement of piston, the smaller volume giving greater pressures, and thus rendering the power developed more mechanically available. Seeing the great difference produced between types 1 and 3 by the simple difference in the cycle operation when there was no loss of heat through the sides of the cylinder, the question arose which engine in actual practice, with the cylinder kept cool by water, would come nearest this theory? In which of the engines would there be the smaller loss of heat? Comparing the two engines, with equal movements of piston, it was found that the compression-engine had the advantage of a lower average temperature, and a greater amount of work done; also of less surface exposed to the flame, and consequently it lost less heat to the cylinder. Taking all the circumstances into consideration, it was certainly not over-estimating the advantage of the compression-engine to say that it would, under practical conditions, give for a certain amount of heat, three times the work it was possible to get from an engine using no compression.

The amount of gas consumed was as follows:—

Type 1. Lenoir,	95 cubic feet per I.H.P. per hour.
" Hugon,	85 " " "
" 2. Brayton,	50 " " "
" 3. Otto,	20 " " "

The Otto engine converted about 18 per cent. of the heat used by it into work, while the

Hugon engine only converted 3.9 per cent. Taking the loss of heat to the cylinder as given by the comparison of the adiabatic line of fall of temperature with the actual line of fall, as shown on the indicator diagram, it appeared much less than was really the case, as shown by the gas consumed by the engine. The maximum pressure produced was much less than would be expected from the amount of gas present; this was due to the limiting effect of chemical dissociation.

In calculating the efficiency of the gas-engine from its diagram all previous observers had fallen into error, through neglecting the effects of dissociation, and, accordingly, their results were much too high. To account for this so-called sustained pressure, Mr. Otto had advanced the theory that inflammation was not complete when the maximum pressure was attained at the beginning of the stroke, but that by a peculiar arrangement of strata he had made it gradual, and continued the spread of the flame while the piston moved forward. Mr. Otto called it slow combustion. This designation seemed to the author to be erroneous; such an action should rather be called slow inflammation. It existed in the Otto engine, but only when it was working badly, and was attended with great loss of heat and power. This was proved by a diagram, and by certain considerations deduced from Bunsen and Mallard's experiments on the rates of propagation of flame through combustible mixtures.

From the considerations advanced in this paper, it would be seen that the cause of the comparative inefficiency of the modern gas-engines over the old Lenoir and Hugon type was to be summed up in one word, "compression." Without compression before ignition an engine could not be produced giving power economically and with small bulk. The mixture used might be diluted, air might be introduced in front of gas and air, or an elaborate system of stratification might be adopted, but without compression no good effect would be produced. The gas-engine was as yet in its infancy, and many long years of work were necessary before it could rank with the steam-engine in capacity for all manner of uses. The time would come when factories, railways, and ships would be driven by gas-engines as efficient as any steam-engine, and much safer and more economical of fuel. The steam-engine converted so small an amount of the heat used by it into work that, although it was the glory and the honour of the first half of this century, it should be a standing reproach to engineers and scientists of the present time, having constantly before them the researches of Mayer and Joule.

### NOTES, HISTORICAL AND STATISTICAL, AS TO HOSPITALS.

MR. HENRY C. BURDETT, F.R.S., in the course of a paper "On the Administration and Hygiene of British Hospitals," recently read before the Sanitary Institute, said that so much misapprehension prevails as to the origin of hospitals that it seems desirable to show by actual evidence that they were known previously to the birth of Christ. The inhabitants of Arabia, Persia, and India, possessed hospitals, some of which were supported by their Governments long before the Christian era. The Buddhists put on rocks their edicts on hospitals, one of which, dated B.C. 220, can be seen near Sourat to this day. Medicines were provided and skilled physicians were appointed to these hospitals at the expense of the State. All the physicians attached to the court, male and female, were compelled to give their services gratuitously to each of the hospitals as they might be required. Hospitals were established among the Fire Worshipers of Persia from the earliest times, the people being compelled by law to maintain suitable houses for the suffering poor of their community, whilst the king provided the best medical treatment for the inmates, free of cost. It is declared, upon evidence not entirely unauthenticated, that the sick were treated so far back as 1124 B.C. in the temples of Æsculapius, at Titaneus, a city of Peloponnesus. The Æsculapian temples had some features, at any rate, in common with our hospitals. Certain of these buildings were set aside for the exclusive treatment of patients suffering from infectious diseases. Tablets were suspended upon the walls, on which were recorded the history and treatment of each patient. Finally, the Valetudinariae, referred to by Seneca and

others, were in reality private pay-hospitals or hydropathic establishments for the well-to-do. The first Christian hospital was founded at Bethlehem, by St. Jerome, in the year A.D. 300, and he it was who first used the word "Hospital" to describe an institution devoted exclusively to the reception and relief of the sick St. Ephraim or St. Faviola is entitled to the credit of founding infirmaries which were supported exclusively by voluntary contributions, and for the sole purpose of treating the sick.

The oldest hospital in Europe now in use is the Hôtel Dieu, which was founded A.D. 600 by St. Landry, bishop of Paris, and the first hospital opened in England was built at Canterbury by Archbishop Lanfranc. Mr. Burdett pointed out, as a remarkable fact, that Guy's Hospital, which is one of a very few, if not the only English hospital founded on the monumental, as opposed to the Christian idea, has recently been the scene of serious controversy, which report declares to be due, at the bottom, to differences of opinion on religious matters. This circumstance, he says, is noteworthy as showing that money left for a specific purpose by a benevolent founder may, in process of time, come under the absolute control of those whose views, and whose mode of administration, are probably very little in accord with the views and intentions of the originator himself.

Passing from the past to the present, Mr. Burdett showed that the number of beds available in the general, special, and convalescent institutions throughout Great Britain approached 25,000, exclusive of Poor-Law and cottage hospitals. The number of in-patients relieved every year at some 200 institutions was nearly 190,000; the number of out-patients relieved at 250 general and special hospitals, and provident and general dispensaries, was nearly 2,000,000 annually. The average gross annual income from all sources received by British hospitals, convalescent institutions, and dispensaries amounts to 1,450,452*l.*, and the average gross annual expenditure to 1,447,601*l.* These figures, which are based upon the average receipts, expenditure, and work during three years, prepared upon an identical basis, and checked by an accountant, went to prove that if the incomes of the different medical charities were fairly distributed according to the requirements of each centre of population, the funds available would be equal to the demand. As a matter of fact, many of the leading London hospitals are now very seriously embarrassed from want of funds. No less than three of the chief of them,—St. George's, King's College, and Westminster,—have lately brought their impecuniosity prominently before the public.

### GERMAN TECHNICAL SCHOOLS.

It is a significant fact that the Legislatures of two of the smaller States of Germany have passed resolutions in favour of the eventual closing of their two principal technical colleges. On the second reading of the Budget in the Second Chamber of the Grand Duchy of Hesse, the following resolution was adopted:—"That the Grand Ducal Government be requested, in case the present paucity of students in attendance continues, to close the Technical High School at Darmstadt at the termination of the present (triennial) financial period of 1882 to 1885." The resolution was passed by a majority of four votes, there being twenty-six members in favour of it to twenty-two against it. The other case is that of the Duchy of Brunswick. On the 8th inst. it was resolved, (a) "To request the Ministry not to increase the expenditure on the Technical High School, and in particular to grant no additions to salaries;" and (b) "To request the Minister to take the question into consideration whether preparations ought not to be made for the abolition of the Technical High School, since the outlay upon it is altogether out of proportion to its expected utility, and for this purpose to lay a suitable Bill before the next Parliament."

It is, of course, not yet certain that these proposals will be approved by the Upper Chambers or by the Governments; but it is difficult to see what prospect there is of an improvement in the numbers of the students in attendance. Brunswick and Hesse are mainly agricultural, and have a population only equal to that of English counties like Nottingham and Kent. Technical students belonging to those duchies find much greater advantage in attending the magnificent technical schools recently founded



or enlarged by Prussia, like the establishments in Aix-la-Chapelle or Berlin. The rews of the resolutions just passed has produced much consternation among the local technical circles, architects, engineers, and others, and an effort is being made to preserve the schools now threatened; but the chances appear against the ultimate success of the movement. In England we are still suffering from the opposite evil,—too great a scarcity of technical schools; but the vigorous action which has of late been taken in the City of London, and the labours of the Technical Commissioners, will, there is no doubt, before long succeed in supplying this important deficiency.

#### NOTES AT THE NAVAL EXHIBITION.

The Naval and Submarine Engineering Exhibition, opened on Monday last in the Agricultural Hall, is, although the first of its kind, one of the largest and completest of the many exhibitions which have been held under the same roof during the last few years. In addition to its claims on the attention of naval and seafaring men, and of all who "go down to the sea in ships," it is replete with interest to civil, mechanical, and marine engineers. In a less technical way the Exhibition has also numerous attractions for the general public, and we are not surprised to hear that it has been largely visited by holiday folk during the present week.

The exhibition includes almost everything required for the construction, fitting, and safe navigation of steam and sailing vessels, and for loading and discharging of cargo, besides innumerable appliances in the form of rafts, boats, belts, and buoys intended to save life at sea under almost all conceivable circumstances. A very interesting section of the exhibition is the large collection of models of some of our finest ocean-going steamers. Particularly noticeable are those lent by Messrs. John Elder & Co., of Glasgow, whose collection includes a large model of that naval curiosity the *Ras-lan* Imperial yacht *Livadia*, built by the exhibitors for the late Czar, Alexander II. Many of the models exhibited are of historic interest, and this is notably so with regard to the model (shown in the Gallery) of the shield used by Brunel in the construction of the Thames Tunnel. This is exhibited by Messrs. Mauchley, Sons, & Field, who also show, on the floor of the Hall, a large working model of engines supplied by them to the "White Star" mail steamers *Britannic* and *Germanic*. Steam steering-gear, steam windlasses, hoists, pumps, and a variety of other appliances used to ensure safety or economise labour on board ship, whether at sea or in dock, are on view. An enormous circular iron tank in the centre of the hall (specially made for the purpose) is filled with water in order to enable divers to display the advantages of the various diving dresses and apparatus exhibited, glass windows being provided at intervals through which visitors to the exhibition can watch operations. In this connexion the working models of Messrs. Clark & Standfield's self-adjusting gripping "camels" for raising sunken vessels should not be overlooked by visitors. They appear to be capable of rendering much valuable service. Dutton's fire-extinguishing apparatus, as proposed to be applied on board ship and in theatres and other buildings, consists of a series of shallow metallic gutters placed near the ceiling, and fitted with covering plates in such a manner that, when the gutters are filled with water or other liquid, it overflows in sheets or cataracts upon the flames.

Among inventions connected with the construction of breakwaters, groynes, or piers, we noticed Mr. George H. Beamish's suggested method of construction with concrete or other blocks (Stand 235). The blocks are made, apparently, of a section somewhat similar to the double-headed or reversible rolled rails used for the permanent way of railways, but, of course, very much larger in section, though in considerably shorter lengths. Blocks of this form are placed upon end, so that the flanges, so to speak, dovetail into each other, thus securing, it is claimed, cohesion of the whole mass (although no cement is used), with freedom for uneven settlement of foundation. At Stand 541 (in the Gallery), Mr. John Thomas, of Bangor, exhibits models of his patent method of construction for seawalls, breakwaters, &c. A casing of iron or

steel of the required form and strength is used for the outer or exposed face of the work. Within this casing the concrete or masonry is built up, but the casing is allowed to remain as a protection against damage by storms. Messrs. Bruce & Batho (Stand 365) exhibit their patent hydraulic dredgers and excavators, which appear to be very effective. They are in use on important public works in India and elsewhere. Messrs. Clark, Bennett & Co. exhibit (Stand 152) drawings and working models of dredging apparatus invented and patented by Mr. W. Smith, C.E., Engineer to the Aberdeen Harbour Board, for raising and clearing sandbars at mouths of rivers and harbours. At Stand 370 Decauville's patent portable railway, with tip and other wagons for use in manufactories and by contractors, are shown. These appliances are in use at the French end of the Channel Tunnel works.

A few inventions connected with railways are shown. Messrs. P. & W. MacLellan, of Glasgow, show (Stand 359) MacLellan & Smith's patent embossed steel sleepers and fastenings, as laid on the Oude and Rohiknod Railway; also their embossed steel buckle-plates for bridges, &c. Askew's patent coupler, shown by the same firm, is a simple appliance or tool for coupling and uncoupling railway wagons without the necessity of sending a man between the wagons. At Stand 512 (in the Gallery) Messrs. Alexander & Co. show Bezar's patent railway lock-out as applied to fish-plate joints. By means of the insertion, in a very ingenious manner, of a looking wire, it is claimed that the nuts cannot become loose for a long time. The invention is at present being tried by the Great Western Railway Company.

Messrs. Eadale & Co., of City-road (Stand 105), show a variety of patent ships' blocks, made by improved steam machinery. Messrs. Cayley & Cayley (Stand 66), the London agents of Messrs. J. A. Fay & Co., of Cincinnati, Ohio, show a number of American wood-working machines in action, driven by an "Otto" gas engine. These machines are all characterised by simplicity and compactness of design, and the workmanship is very good. Especially deserving of notice are a planing-machine, planing up to 24 in. wide, and the "Variety" wood-worker, capable of doing the varieties of work done by what are called in this country "General Joiners." The first-named machine, it is stated, is in use in every ship-building yard on the Clyde. Messrs. Tanyge Bros. (Stands 49 and 191) have a variety of useful machinery and tools, but among their specialities may be mentioned as particularly worthy of notice Cherry's patent "whipping and cargo hoists" for discharging coal, grain, &c. They are very simple and rapid in action, and exceedingly easy to control. The "Palomenter" patent steam-pump is shown at Stand 46. The simplicity and effectiveness of this invention have won for it a high place in the estimation of engineers and contractors. Messrs. R. Nones, Head, & Jeffries, of Ipswich, Mr. E. S. Hindley, of Bourton, and Messrs. Robey & Co. of Lincoln, are among the most well-known of the exhibitors of steam-engines and boilers. Hodson's patent high-speed expansive rotary engine is shown at work at Stand 62, driving one of De Bay's screw-propellers, which appears to be capable of effective service as a fan or ventilator. Among other exhibitors of ventilators suitable for ships we noticed Messrs. Robert Boyle & Son (Stand 384), Messrs. C. Kite & Co. (Stand 272), and Messrs. Moses & Mitchell (Stand 128). Mr. Bellamy, of Millwall, shows ships' tanks, a drum-bay, and an 8-ft. conical water-ballast beacon-buoy, with internal bulkheads, and surmounted by mast and ball, as made for the Corporation of the Trinity House. Messrs. Burney & Co., of Millwall, are also exhibitors of painted and galvanised tanks, for ships' use. Mr. E. Clements (Jeakes & Co.), at Stand 367, shows a ship's cooking-apparatus, with five large ovens. At Stand 490, the capabilities of the Bower-Barff process for preventing the destruction of ironwork by rust are illustrated by numerous specimens. Mr. J. Westwood, jun., exhibits, at Stand 497, Hawkeley's patent stair-treads, which are well known for durability combined with excellence of foot-hold. Messrs. Johnson, Gregson, & Curry exhibit, at Stand 242, Johnson's patent sleeping-berths, for married emigrants and their families; they have many advantages. At Stand 430, Messrs. W. Woolfame & Co. show their patent embossed and varnished floor and other papers, suitable for decorations for ships' saloons, &c. The United Asbestos Company show (Stand 120), among other products,

their asbestos fireproof paints. The Sanitary Paint Company (Messrs. Griffiths, Berdce, & Co.), Liverpool, exhibit, at Stand 424, various paints and compositions specially manufactured for marine purposes, including "Griffiths's Patent White." Balmains's Luminous Paint is shown by Messrs. Thies & Horne, at Stand 3138, as applied to life and mooring buoys, ships' figure-heads, &c. The Indestructible Paint Company exhibit (Stand 415) Brown's Patent Preservative Paints for ships' use. Messrs. Chubb & Son (Stand 3114) show locks and safes, and pursers' and ballion chests. Mr. George Jennings, of Stangate, has generally some new and useful invention to display, and here, at Stand 345, he shows a very good self-acting closet suitable for use not only on board ship, but in railway stations and in other places where rough usage has to be withstood. It consists of a cast-iron hopper, enamelled inside, and fitted with a seat which springs up when the user rises from it, leaving the hopper free for use as a urinal or slop-sink, and at the same time giving a good flush. Other ships' closets, and some excellent tip-up lavatories provided with splash-rims, especially for use on ship-board, are shown by Mr. Jennings. Messrs. Ewart & Sons (Stand 391) exhibit ship's baths; Mr. J. L. Hancock (Stand 335A) exhibits india-rubber goods and diver's dress; Messrs. Hayward Bros. & Eckstein (Stand 150) show ships' deck-lights; Mr. T. W. Helliwell (Stand 347) exhibits his patent systems of roofing with glass or metal; Messrs. Rendle & Co. show (Stand 342) the "Acme" glazing and the "Electric" paint-removers and cleaners; the Silicate Paint Company (Stand 111) put forward their paints and an anti-fouling composition for ships; and Messrs. Wilson & Co. (Stand 130) their alkaline composition for removing paint.

We have only mentioned a few of the things to be seen in this exhibition, which closes on Thursday next, the 20th inst. The catalogue is well got up, and, as far as we have had occasion to test it, carefully compiled.

#### NEW LIBERAL CLUB-HOUSE AT LEEK.

ALTHOUGH the celerity of the action of Aldin's lamp cannot be claimed for the movements of the building trade in general, in many other respects the magic lantern immortalised by Scheherazade might have been at work at No. 6, Russell-street, Leek, henceforth the comfortable caravanserai of the Liberal politicians of the town. The former dingy habitat of Leek's board of "city fathers," who seem to have had a hardy fortitude enabling them to subsist sans licht, sans air, sans every sanitary essential, has been transformed into the model of a modest club-house, endowed with sweetness and light in the shape of thorough-paced ventilation and ample windows and artificial illumination, and well supplied with cory, not to say luxurious, appointments. The accommodation consists of a pair of fine, lofty billiard-rooms, an excellent reading-room, committee, chess, and card-rooms, with manager's house, lavatories, cellaring, &c. The billiard-tables and their accessories have been supplied by Messrs. Orme & Sons, and leave nothing to be desired. The seating throughout is upholstered in peacock blue rep on grained walnut woodwork, contrasting agreeably with the light and cheerful tones of colours adopted in the decoration of the premises. The alterations have been carried out under the designs and superintendence of Messrs. William Sogden & Son, architects, of Leek, by Messrs. Thomas Grace, J. & J. Mathews, and Isaac Heath, builders, Leek.

**Drinking Fountain, Westminster.**—On the 29th ult. the Baroness Bardett-Counts, in the presence of a large number of friends, uncovered a new drinking-fountain at St. Stephen's Schools, Westminster. It is constructed of polished Cornish grey granite to a height of 4 ft. 6 in., the upper part being in Portland stone, with carved panels and crocketed pinnacles and spire in Decorated Gothic, to harmonise with the adjoining church, St. Stephen's, which was built and endowed by the Baroness some years since. The fountain is set back on to the school-ground by a curve in the railing, and has two drinking-basins useable by the schools and the public, with a dog-trough in the granite step. Mr. A. Bradford was the sculptor, and Mr. H. H. Bridgman was the architect.



### THE MANCHESTER TIDAL NAVIGATION SCHEME.

The intercommunication between Manchester and Liverpool is probably greater than between any two places elsewhere in the world. The improvement of the natural channel to the sea afforded by the Mersey-Irwell, if affected after the manner of the improvements of the Clyde Navigation, would provide a mode of communication for the enormous traffic between the two cities far cheaper than the most favourable rates that railways could afford to offer. This obvious consideration has led to the inception of a movement for the organisation of a syndicate for the carrying out of the projected Manchester tidal navigation. The distinctive character of this scheme is the construction of a channel from Manchester to the sea of sufficient depth to allow of a range or rise and fall of tides such as occurs in the harbour of Glasgow as the result of the deepening of the Clyde, and as at Newcastle from the deepening of the Tyne. Owing to the slight elevation of Manchester above the sea-level, together with its comparative nearness to the sea, and its connexion therewith by an easily improvable natural water-way, there is no difficulty whatever in an engineering sense to interfere with the proposed undertaking. The existing Mersey and Irwell navigation is only suited to barges of 40 to 60 tons. The improved navigation would provide a depth of water by which Manchester would be accessible from the sea by the largest ocean-going steamers with the same ease that London is now reached by the Thames or Glasgow by the Clyde.

We should be disposed to expect great advantages as the result of such an undertaking.

### PLYMOUTH MARKETS COMPETITION.

This competition, like too many others, is producing much squabbling. The referee, Mr. Waterhouse, hesitated somewhat between two designs,—one, "Ye Cheaps" found to be by Messrs. C. King and the late H. Alty, the Borough Engineer; the other, "Measure for Measure," by Messrs. Coe & Robinson. The Town Council have given the first premium to the latter, but decide to carry out the former, to which the second premium is awarded, and that, too, in face of the opinion given by the referee that it will cost much more than the stipulated amount. It is regarded as very objectionable that Mr. Alty, as an officer of the corporation, should have entered the competition, in which we fully agree. Moreover, the authors of the design "Experience," to which the third premium has been given, Messrs. G. B. Nichols & Sons, assert that many of their views, discussed confidentially with the late Borough Engineer, have been adopted in the plan which bears his name. Mr. King writes to deny this entirely, but the fact that such an assertion can be made shows that Mr. Alty had placed himself in a wrong position.

### DUST REMOVAL.

The following passages occur in the last Report of the National Health Society (41, Berners-street):—

A sub-committee was formed in the spring of the past year for the purpose of endeavouring to effect a reform in the systems of dust removal and disposal in the metropolis. Under the system of collection which now exists, houses are made unhealthy by the decomposition of animal and vegetable refuse, which is allowed to remain too long undisturbed, and which can seldom be completely removed from dust-bins. As things are now hundreds of people are employed in the revolting occupation of sorting the refuse. It is unnecessary here to enlarge on the evil influence upon the health of the community of this plan of dealing with house refuse. After full inquiry into the arrangements adopted in various large towns throughout the country, the sub-committee issued a circular to the metropolitan vestries, requesting them to take some action in the matter, and offering a few suggestions for their consideration. It was proposed that dust-bins should be abolished and metal tubs substituted; that the collection should be systematised, and each house should be visited not less than twice in every week; that the household should be obliged to allow this frequent removal of the refuse; that the refuse should be destroyed by fire (the latter suggestion inferring that the plan of sorting should be abolished). From the letters

which were received in answer to this circular we find that the majority of the vestries cordially approve of the suggestions offered. The Vestry of the Parish of St. John, Hampstead, has been foremost in its endeavours to introduce the use of tubs in the place of dust-bins, and other vestries are also endeavouring to effect a similar improvement. In the parish of St. Mary Abbott's, Kensington, the vestry clerk reports that a house-to-house visitation at frequent and regular intervals has been in force for three or four years, and has worked well. At St. Mary, Newington, the district has been divided into six sub-districts, each of which is visited once a week, and great care is taken to prevent the accumulation of refuse in the dust-bins. In Bermondsey, also, the plan adopted is superior to that of some other parishes. The St. Pancras Vestry have for a long time past been inquiring into the subject, with a view to reforming the old-fashioned system. They have issued a voluminous report, which shows how many difficulties have to be dealt with. Their chief aim appears to be the effectual disposal of the refuse. It will thus be seen that there exists a great desire upon the part of the metropolitan vestries to adopt improved systems of dust and refuse removal, but it is a noteworthy fact that hitherto they are considerably hindered by many of the northern towns. Fryer's process of carbonising and of destroying the refuse has been used for some time (for several years in some instances) at the following places:—Leeds, Manchester, Bradford, Warrington, Stafford, Rochdale, Bolton, Birmingham, Blackburn, Rotherham, Derby, and Bury. Dr. Sedgwick Saunders, Medical Officer of Health for the City of London, has published a report upon the disposal of refuse, which shows that active steps are contemplated by the authorities of the City district as well as by the St. Pancras Vestry, and doubtless before long reformation with regard to the disposal will be effected, but an improved system of collection and the abolition of house dust-bins are less likely to be enforced by the authorities. The sub-committee of this Society believe that such improvements must be brought about chiefly by individual action, and they urge all householders to adopt the following suggestions:—(1.) To abolish the dust-bins, and substitute metal tubs or sacks. (2.) And insist upon the regular and frequent collection by the dust contractors. A lady member of the committee (Mrs. Priestley) has instituted the plan of employing a few sacks, which are suspended upon parallel bars. When the dustman calls, he carries away the sack or sacks full of dust, and returns them empty upon his next visit. By this means all the material is carried away, time is saved in the collection, and many of the evils of the present system are avoided.

### NEW PUBLIC HALL FOR WANDSWORTH AND BATTERSEA.

THE Wandsworth and Battersea Public Hall Company are about to erect a large new public hall, near the Clapham Junction Railway-station, the site of the intended building being at the corner of Lavender Hill and St. John's-road, and about midway between Wandsworth and Battersea proper. An enormous population is at present springing up in the immediate locality of the proposed hall, the site scored being at the north-western angle of an extensive property known as the Lavender Sweep Estate. This estate, which is upwards of eight acres in extent, and stretches in an easterly direction to near the north-western boundary of Clapham Common, and on the south side to Battersea-riars, was until recently the seat of a well-known City capitalist, lately deceased, the mansion being surrounded by thickly-wooded grounds. Within the last few months the property has been laid out as a building estate, spacious roads, from 40 ft. to 50 ft., having been constructed, and the valuable timber cleared away. It is estimated that the total number of houses to be erected on the estate is between 200 and 300, at rental values ranging from 55s. to 90s. Upwards of 100 of these residences have already been erected, and builders are at present actively at work in the erection of others. The public hall about to be erected on the estate will have two frontages, one facing Lavender-hill, and the other St. John's-road. The ground-floor will consist of shops, the public hall, and committee and other rooms in connexion with it forming the other portion of the building.

The hall will have accommodation for an audience of 1,000 persons. It may be added that another estate between Battersea-riars and Clapham Common, close adjoining that named, has just been covered with a similar class of buildings, having been converted from a purely suburban neighbourhood into a very numerous, populated locality.

### THE RESTORATION OF TRING CHURCH.

AFTER having been more or less in progress for twenty years, the restoration of this fine church is now complete. The works were commenced in 1861 under the late Mr. Slater. There was originally an Early English church, of which a beautiful south doorway and a window exist,—then a fourteenth century rebuilding on a large scale,—with a nave and two wide aisles, and the lower part of a west tower, followed by a fifteenth-century reconstruction, involving new arcades of grand proportions, including oak roofs, screens, &c.

In the seventeenth century, in the days when Gothic art was expiring, the aisles were reconstructed, the chancel roof lowered, and its windows recast; and, later still, the whole was covered with rough-cast and Roman cement outside, and whitewashed inside; it was filled with pews, and every available space in the interior excavated for graves and vaults.

It was found that the foundations, originally but shallow, had gradually given way, and the whole church had settled northward; but, excepting in the case of one column (which was renewed), there seemed then no danger to be feared, and the first works, therefore, only included new oak roofs according to the old detail, and new seating also in oak, and a cleansing and repair of the interior. These were executed by Mr. Cooper, of Aylesbury.

In 1871, the architects reported on the exterior, which, like most churches of the district, had been covered up with cement, owing to the decay of the soft Clunch stone dressings, the flint work, of course, remaining sound. However, it was not till some years later that the works were resumed by the building of an organ-chamber and vestry, as a continuation of the north aisle, and then by the complete restoration of the exterior of the south side and clearestory; every sound old stone was retained, and all the internal work of the windows. The defective stone was replaced with new Ancaster stone, and the flint facing was repaired and pointed.

In 1880, the works were again resumed and carried forward to completion; the tower was first stripped of its rough-cast and cement, and each decayed stone marked and replaced by a new one corresponding with it, all weatherings and string-courses, &c., being required to be renewed. On investigation, the design of the old parapet in checker-work of flint and stone was found, and has been reproduced.

During the progress of these works it was discovered, after repeated trials, that the whole north arcade, with its clearestory, and the north aisle wall, were going over slowly to the north. It therefore became necessary immediately to erect an extensive system of shoring to carry the heavy oak roof of the nave, while the north side was taken down and rebuilt. In the rebuilding, the crashed Clunch pillars were placed by new shafts and bases of Portland stone.

The rebuilding of the north aisle followed, and there were discovered many stones of the ancient fifteenth-century windows; these have been reproduced. There were also found numbers of stones of the piers, arches, and capitals of the long-since-destroyed fourteenth-century arcade. These are preserved, and will be rebuilt in the nave of the district church of St. Marthas, which is already commenced in that style. The ancient piers and bases of the fifteenth-century arcades removed are about to be rebuilt in the new neighbouring church of Long Marston, as they will be amply sufficient there for their purpose.

Traces of the fourteenth-century porch were found cased up with brick; these have been sufficient to guide the design of the new one, on which the old stones are retained *in situ*.

The piers of the south arcade were then taken in hand, the foundations being in a dangerous state, and the columns themselves showing signs of crushing and splitting. Each column was, therefore, taken out, one at a time, and replaced by a new one of Portland stone.



From first to last upwards of 8,000l. have been expended on the restoration, under the direction, first, of the late Mr. W. Slater, and then under Mr. R. Herbert Carpenter and Mr. B. Ingelow, of London, the greater part of the work being carried out by Mr. Fincher, of Tring, builder, with Mr. Lingard as mason, Mr. Smith being latterly clerk of the works.

## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 1,432. W. Bartholomew, Lambeth. Flushing-tanks. March 24, 1882.  
 1,434. E. G. Banner, London. Sewers. March 24, 1882.  
 1,435. B. Finch, Westminster. Chimney flues. March 25, 1882.  
 1,458. L. A. Grotti, London. Composition for rendering wood, &c., unflammable. (Com. by H. R. P. Hoeemann, Berlin.) March 27, 1882.  
 1,466. W. L. Fison, Stourmarket. Perforated tiles. March 27, 1882.  
 1,498. W. R. Lake, London. Metallic shingles for roofing purposes. (Com. by C. Comstock, New Canaan, U.S.A.) March 28, 1882.  
 1,522. J. B. Denton, London, and G. Butler, Turbam-green. Apparatus for flushing sewers, &c. March 29, 1882.  
 1,553. G. H. Wilder, London. Looks or fastenings. March 30, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named.

March 28, 1882.

- 5,118. H. J. Haddon, Kensington. Construction of roads and pavements. (Com. by J. Salvat, Moreux, France.) Nov. 23, 1881.  
 5,351. T. Rowan, London. Warming and ventilating apparatus. Dec. 7, 1881.  
 5,377. D. G. Cameron, Lambeth. Water-closets, &c. Dec. 8, 1881.  
 258. R. G. Greig, London. Stoves for heating and ventilating. (Com. by the Detroit Stove Works Company, Detroit, U.S.A.) Jan. 18, 1882.  
 1,213. R. Wright, Richmond. Firegrates, &c. March 13, 1882.

March 31, 1882.

- 5,232. W. Hutchinson, London. Portable heating apparatus. Nov. 30, 1881.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending April 1, 1882.

- 3,428. F. H. Beattie, Soho. Roof principals, &c.  
 Instead of making holes in the frames, &c., clipping pieces are used to grip the rafters or compression-booms, to which are connected the accessory parts. Aug. 8, 1881. Price 10.

- 3,447. W. G. Macvittie, Sutton Coldfield. Attaching knobs and handles to their spindles.

On one of the faces of the square spindle is a rack, and a square tube inserted in the knob fits this spindle; a catch passes through the tube and engages a tooth on the rack. Aug. 9, 1881. Price 6d.

- 3,507. E. G. Brower, London. Plastering and plasterer's moulds.

Moulds are made by which the plaster is moulded immediately on the wall in its place. (Com. by D. W. Sacchetti, J. M. McGeary, & E. W. Anderson, Washington, U.S.A.) Aug. 12, 1881. Price 6d.

- 3,512. T. Redmayne, Sheffield. Stoves and fireplaces.

These have solid bottoms, and a midfeather is arranged towards the back, with a cover on the top through the passage between which the gases, &c., from the fire are allowed to flow, and the midfeather is a space under the bottom of the fireplace, whence they pass to the chimney. Aug. 13, 1881. Price 6d.

- 3,582. C. Winn, Birmingham. Water-waste preventers.

A syphon is placed inside the cistern, the open leg of which is covered by a cap. When the cistern is full the ball-valve closes the filling-cock, and when the cap is lifted off, the syphon empties the cistern. Aug. 17, 1881. Price 6d.

- 3,620. J. Craig, Kilmarnock. Dressing enamelled bricks, &c.

After the bricks have been dipped in the enamelling or glazing composition, they are dressed or "mossed" by an endless travelling mill, which rubs off the enamel from the edges. Aug. 19, 1881. Price 6d.

- 3,633. S. Mead & J. W. Tiptaft, Birmingham. Adjusting action for swing sashes, &c.

On the standard is a bracket carrying a stand, on the end of which is a toothed disc, and on the frame is a socket, in which a spring-bolt engages one of the teeth of the disc. (Pro. Fro.) Aug. 20, 1881. Price 2d.

\* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

- 3,689. A. H. Windsor, Brentwood. Bolts for fastening doors.

Attached to the bolt is a plate, which shows through the door on the outside, and indicates whether the bolt is closed or withdrawn. (Pro. Fro.) Aug. 24, 1881. Price 2d.

- 3,708. A. MacLeod, Shrewsbury. Floors or surfaces for skating upon.

These are made of lac, or resin, or bitumen, &c., which, after being spread on the surface, are fused, and then allowed to cool. Aug. 25, 1881. Price 2d.

- 5,590. H. H. Lake, London. Door-checks or devices for preventing the slamming of doors.

A cylinder with a spring piston is fitted to the door. There is an automatic valve in the cylinder in the rear of the piston, and when the door is opened air is admitted into the cylinder. As the door is closing, the door-post drives the piston-rod in and compresses the air in the cylinder, thereby preventing any slamming. (Com. by L. C. Norton, Boston, U.S.A.) Dec. 21, 1881. Price 6d.

## SMOKE ABATEMENT EXHIBITION AWARDS.

THE Executive Committee of this exhibition have made awards, after receiving the reports of the jurors, in the following sections:—

*Gas Section.*—To Messrs. Thompson Brothers, of Leeds, a gold medal for their patent kiln and baker's oven, being a distinctly new application of the use of coal-gas, and one calculated to largely promote the abatement of smoke.

*Cooking Stoves, suitable for about twelve persons.*—To Messrs. H. & C. Davis & Co., of Camberwell, silver medal; to Messrs. Beverley & Wyld, of Leeds, silver medal; to Messrs. J. Wright & Co., of Birmingham, silver medal; Messrs. Stark & Co., of Torquay, silver medal, in recognition of the principle adopted by them of burning the gas outside the oven in which the cooking is carried on; Messrs. Billing & Co., New Oxford-street, bronze medal; Messrs. Leoni & Co., New North-road, London, bronze medal; Mr. G. Wilson, of Leeds, bronze medal; to Messrs. Waddell & Main, of Glasgow, bronze medal.

*Stoves suitable for Large Establishments.*—To Messrs. Slater & Co., of Holborn, silver medal, for excellence of material and workmanship.

*Heating Stoves.*—For close stoves, from which the heat is conveyed into the apartment by conduction from pipes or chambers through which the heated products of combustion pass:—To Messrs. Stark & Co., of Torquay, for Cox's ventilating gas-stove, a silver medal; to the Sanitary and Economic Supply Association, of Gloucester, for Dr. Bond's anthracite ventilating stove, pattern A, a silver medal. Open stoves, or combination fires, in which gas is burned in combination with solid materials, and the heat radiated into the apartment.—To Messrs. Waddell & Main, of Glasgow, for Dr. Siemens's gas and coke fire, a bronze medal; to G. Wright & Co., Rotherham, for Dr. Siemens's gas and coke fire, a bronze medal. Gas-baskets or fires from which the heat is conveyed by radiation.—To Messrs. Leoni & Co., New North-road, London, for hanging gas-fire, a bronze medal.

## DOUBLE COMPETITIONS.

SIR,—Will you permit me to say, with reference to the discussion of this subject, that the example of the Manchester Town-hall hardly applies in the recent competitions; for in the three large ones now in progress on the system of double competitions, viz., Glasgow, Dublin, and Birkenhead, there is little or no latitude respecting the sketches. Very stringent rules are laid down for the sake of uniformity, and it is distinctly stated that there must be a certain number (and a very unnecessary number) to a prescribed scale, finished in pen and ink. In these cases the cost to each of the selected men must be very considerable.

The scale in the Manchester competition was only one-sixteenth for the final plans, and quite sufficient for any building. The remuneration was 300l. to each of the selected men, instead of 150l. Whatever can have induced the assessors to sanction the one-eighth scale is beyond comprehension.

Under the present tendency of the age for competition in everything, unless the number of drawings and scale are reduced to the minimum, architects will rue the day the double system was entered into, for the public have been quick enough to perceive that it enables them to ask for and obtain two sets of plans, one of which is large enough for working drawings.

MANCHESTER.

## A MEMORIAL OF THE LATE SIR ANTONIO BRADY.

As a memorial of the late Sir Antonio Brady, who died a few months ago, St. John's Church at Stratford is about to be enlarged. The deceased, who for many years took much interest in the welfare and improvement of the East End, was one of the Verderers of Epping Forest, and was also amongst those who took active steps with the view of freeing the Forest for the use of the public. Sir Antonio, amongst other efforts, also worked hard with a view of promoting technical education at the East End, and did much to bring about the establishment of the Bethnal-green Museum.

## THE SITES FOR ARTISANS' DWELLINGS AND THE METROPOLITAN BOARD OF WORKS.

THE following statistics show the loss which the Metropolitan Board of Works has sustained in the purchase and re-sale of sites under the Artisans' Dwellings Act. We are not to be understood as condemning the proceeding without qualification, for all that. We may consider this question more at length on another occasion. By the operation of the Act the Board have acquired twelve of these sites in different parts of London, which from time to time have been re-sold. The total area of the sites which have thus been purchased is forty acres, at a cost of 1,571,500l., or an average of 39,300l. per acre. Some of the sites, however, cost more than double that sum. The highest price paid was 81,000l. per acre for the Bedfordbury site. For the Great Wild-street and Drury-lane site, 75,600l. per acre was paid. The Whitecross-street site cost 54,800l. per acre; and that in Gonston-street, Whitechapel, 49,400l. per acre; whilst one in High-street, Islington, was purchased for 37,600l. per acre. The lowest price paid was for a site in Wells-street, Poplar, for which the Board paid 22,800l. per acre. On the re-sales of the land to the Peabody Trustees and the industrial dwellings companies, the highest price which the Board have received is at the rate of 11,000l. per acre, or 355,000l. in all, showing a loss on these land purchases of 1,215,600l. Although forty acres were purchased, not more than three-fourths of this area,—about thirty acres,—can be used for building upon, the remaining portion being utilised for street improvements.

## A GIPSY NUISANCE AT WOODFORD.

FOR some time past a tribe of gipsies has been invading several districts in the neighbourhood of Woodford, and the evil appears to have attained to such dimensions as to be depreciating the value of property in the localities affected. The matter came before the Woodford Local Board at their last week's meeting, when the resolutions which had been passed at a meeting of owners and occupiers of property were laid before the Board, who were asked by the terms of the resolutions to take steps for removing the nuisance caused by the encampment of the gipsies in various parts of the district. Whilst the matter was under discussion by the Board, the clerk stated that he had found out three of the owners of property on which the gipsies were encamped, and had served them with notice to abate the nuisance within three days. Two of these owners had communicated with him, one of them stating that the gipsies had no business on his grounds, and that he had ordered them off, but they declined to leave. Another owner said he had given the gipsies notice to quit. In answer to a member of the Board the clerk said that the owners would be summoned on sanitary grounds, for not having complied with his notice. Mr. Nicholas, a member of the Board, said it was a very serious matter, as he knew several persons who had property which they could neither let nor sell in consequence of these people being in the neighbourhood.

## FUR IN KETTLES.

SIR,—The best way to keep down the incrustation of kettles is to partly refill them with cold water immediately after the boiling water has been poured out. The sudden change in temperature chips off the fur, and the sediment can be emptied out. It does not prevent incrustation, of course, but it keeps the evil in check in proportion to the way it is used.

THOS. C. BERRY.



## THE ROYAL COMEDY THEATRE.

SIR,—I am glad to find that the *Builder* is properly appreciated, and that good advice given is followed. The matters of which I complained (vol. xii, p. 559) have been chiefly altered. The meeting of the pituites and gallery gods has been severed; the latter entering from another street, whereby the door to the pit (formerly the gallery door) is opened to the full (the doors still open inwards), and a larger space is allowed before reaching the stairs leading to the pit, and the money-taker's place is on the middle landing. The act-door, which was anything but a passable piece of execution and design in the shape of art, has had a large fan painted over the position where formerly the extraordinary assembly of Capitols was shown, looking as if the fan was held up to hide that which should not have been exposed to critical eyes. Booking fees are also done away with. The wasteful avenue down the centre of the pit has been filled up with seats. The avenues are now at each side against the walls. But there are still objectionable things left unaltered. As to the wooden staircase to boxes, I do not know what answer can be given to the question why it is not of "stone or other fire-proof material," as required by the Building Act. Y.

## PUBLIC INTEGRITY.

## INSURANCE AND GUARANTEE COMPANIES.

SIR,—No less than 1,800 joint-stock companies in this country within the past few years have either collapsed or become bankrupt, involving a total loss to innocent and helpless shareholders of millions of capital. Now the object of public integrity, insurance, and guarantee companies is to guarantee to each shareholder the repayment of the money actually paid by him on his share against the events of either the collapse or of the bankruptcy of the joint-stock company, each shareholder yearly paying to such company a small ascertained premium. As a guarantee of good faith, then, to the great body of shareholders and to the public, every joint-stock company should be compelled, by Act of Parliament, to insure the whole of its paid-up capital in one of these companies. As between, therefore, directors of joint-stock companies on the one hand and the shareholders or the public on the other, public integrity, insurance, and guarantee companies would stand in the position of protectors and indemnifiers.

AUGUSTUS J. HARVEY.

## THE PARKES MUSEUM.

SIR,—With regard to the complaint made by "Householder," I beg to be allowed to say:—

1. That the means at the disposal of the committee are insufficient to allow of the museum being opened on more than three half-days in the week.

2. That the museum cannot be opened on Saturday afternoons at present because University College, in which the museum is now located, is, by order of the Council of the College, closed at two p.m. on Saturdays.

The executive committee are taking steps to incorporate the museum and establish it on a more independent footing, and, as soon as the preliminary arrangements are completed (which will probably be in a week or so), an appeal will be made to the public in order that the Parkes Museum may be thoroughly established as a national institution.

To do this a considerable sum of money will be necessary, and it will rest with "Householder," and others interested in questions of health, to help, by their contributions, to make the museum more generally useful than it is at present.

G. V. POORE, Honorary Secretary.

**The New Westminster Abbey Gardens.**—The new Westminster Abbey Gardens were opened on Wednesday without ceremony. The old gravestones have all been removed, and in their place there is now a grassy surface, which is divided into plots enclosed by small iron fences. Around the outside boundary are erected iron railings with stone pillars at intervals, within which are planted a number of trees facing the public road. The principal entrance to the Abbey is paved with a broad stone pathway.

## THE CONDITION OF OPERATIVES.

SIR,—Would you kindly render a service to a number of deserving people by publishing this letter? It is said that one half of the world does not know how the other half lives: so upon an impulse I send you my practical experience as a *bona fide* London workman,—and, I presume, a good mechanic, in the prime of life, aged 39, having had a diversified experience, and at one time a masterman,—to show the unthinking portion of society the affliction that is at present being borne by a deserving and productive class. I am a born Londoner, and served my apprenticeship, which having finished, I continued as a journeyman until, by dint of perseverance, I saved what I considered sufficient to enable me to start in business on my own account, good patronage having also been obtained. After having been wearied by overwork and bad debts, I took charge of premises for a gentleman, and returned to journey-work. Though I have a wife and mother to keep, and have not been blessed with a family, I can feel for those who have one. Five months ago I had a slight altercation with the managing man of the firm at which I had been employed for twelve years, and in consequence of a very frivolous misunderstanding I left their employ, and can now give some idea of the condition of the operatives,—the consequence, I believe, of the competition amongst a class of employers who profess to be what they know best to be, and who will give estimates for work at random, resulting in a deplorable grinding down of labour and skill as a rule. I am a moderate man, and not a teetotaler, so that I see and have chances to observe the different conditions as they meet my notice of the dejected, careworn, good, honest, and careful men whom I have taken to task upon their condition through want of employment, and I give you, sir, one example out of many with which I have met.

I went out early yesterday morning to seek employment, and walked continuously for about eight hours, a very long round, and called in vain at thirty-four picked good shops, in company with a very respectable-looking man, that I met leaving a shop where he had been applying for work, and who, in the course of the day, showed me about a dozen testimonials of his ability and character. He had had the charge of some very good work as foreman of works, was a married man with six young children, and had had but three weeks' work of varied employment, for the past nineteen weeks, and, as he reluctantly informed me, through sickness and death in his family, was so reduced that he had had to part with his tools for existence.

I could relate many similar cases, but will not further encroach: suffice it that I could not have believed some time ago there was so much patient misery about as I have seen these few months past.

I will hope this appeal to a wealthy and charitable public will induce a little healthy speculation to provide employment for the thousands who depend, at best of their time, from hand to mouth. Surely some inducement might be given to stimulate emigration. There is such fierce competition between our modern employers, that what with a scarcity of work and continually increasing activity in the workshop, and such an ever-increasing use of machinery, the prospects of our class are neither refreshing nor hopeful. Will some of our retired capitalists or reflective gentry kindly interest themselves in this question?

ONE NOT BLESSED WITH INCUMBRANCES.

## SKILLED WORKMEN.

SIR,—Having read with great interest what has been written by other contributors on this question, I am led to ask your kind indulgence to add to my former letter a few more remarks on the subject.

I am the more induced to do so, because I believe that until we can succeed in tracing this evil to its proper source, we can arrive at no satisfactory understanding as to what course should be recommended as a means to bring about a remedy, and if this discussion is to come to an end without some suggestions being made in that direction, it might well not have taken place.

But to proceed. No one needs to be reminded of the fact that during the last, say, twenty-five years, the building trade, not only in the metropolis, but in many provincial towns, has been visited by frequent strikes; some have been of large dimensions, and lasted over a considerable period of time. These disputes, which wherever they happen, are certain to create,—and, while they last, maintain,—a tedious demand for hands; for the employers use, as they have a perfect right to do, every endeavour to fill up the places of the men on strike. They hold out every inducement so as to attract men to their works, engaging all that present themselves, and willingly pay to do so without discrimination the full current rate of wages, not caring to look too closely into the capabilities of the new comers, the majority of whom are, as a rule, either young fellows who have had no opportunities of acquiring skill, or men who never had any capacity to do so; because an experienced artisan, although he may have no sympathy with a strike, has a natural repugnance to be designated a "black sheep."

Again, strike or no strike, young men in country

districts have at all times a hankering after the opportunity to taste the novelties of town life, more especially life in London. This desire is stimulated by the fascinating accounts they hear of high wages and plenty of work. In days gone by their ambition was kept within reasonable bounds by the difficulties of distance, and only the more venturesome would have the pluck to make a start. But, nowadays, have removed that barrier. Therefore, nowadays, by the time a young fellow has begun to learn the names and uses of the tools, and acquired the smallest amount of manipulative skill, he is off to town. In consequence of this there is an over-increasing stream of such as these flowing into London, and it is an axiom well understood that once a countryman gets a start in London, he will suffer any amount of privation rather than return to his native place to stop.

Not that I wish to imply that because a young man gets his first lessons as a craftsman in the country he is the worse for it in after-life, providing he shapes his course in the right direction. I was born and apprenticed in the country myself, and I can not but believe it may be better, as well within the truth than I say the majority of the leading men in the building trade were originally from the country. But what I mean is this, that, owing to the circumstances I have narrated, the influx is greater than is justified by the demand; for be it understood, the large number continually coming in (as I have described in my letter of the former letter) in the metropolis do not migrate,—they are here, and here they stop. Consequently the market is glutted with workmen whose previous training has been of a very limited character, and it is ridiculous to suppose that an experienced workman can, like a garment, be made to order.

Of course, if these, in my view, are the facts, as their predecessors have done, turn out to be good men; for, as I have been justly remarked, there are now, as there always were, plenty of good men to be found, men that are able to go anywhere and do anything, but their development is the result of time and opportunity, blended with diligence and industry. I am not, however, aware that the metropolis has sent out in too many cases lamentably conspicuous by their absence.

It is argued that unskilled artisans are preferred to good men because they are cheap. I do not deny this may be the case with some small jobbing firms, and in the more subordinate branches of the trade, but with larger contracting firms, and in the constructive branches, especially, it is notorious that the men are as a rule paid at a uniform rate so as to avoid conflicts, and because it is erroneously believed that by following that course none but fairly experienced hands will be engaged; but, unfortunately, it only too frequently leads to opposite results, because then one often finds the principals in the firm are interested. And here lies the pith of the whole question, because if novices or improvers were paid only in accordance with their qualifications, there would not be so much attraction to draw so many into the trade, nor so many incitements for a middleman to "manufacture" and foster them to suit his purpose, to the detriment of the matured and experienced men. And if the unions were sincere in their statements, and thought less of the importance of large numbers on their books than the status in skill of their members, they would have done long ago what they would have people believe they are now doing,—looking after the best interests of their particular craft, and defending and protecting the *bona fide* skilled workman against the encroachment of the pretentious duffer and the greed of the employer. ONE OF THE OLD SCHOOL.

**The Improvements in Little Bridge street.**—Good progress is being made in clearing away the old buildings acquired by the Commissioners of Sewers for the widening and extension of Little Bridge-street, Blackfriars. The *City Press* says:—"An interesting portion of the work is the demolition of that well-known remnant of the old Roman wall which originally extended from Lud Gate, and followed the course of Pilgrim-street, at the angle of which still remains the corner-stone of the old postern. The wall appears to have been continued down the northern side of Pilgrim-street, and to have crossed the present St. Martin's-court as far as the old Fleet Ditch. The part now being demolished is situated at the south-western corner of St. Martin's-court, and extends above the present surface some 30 ft. westward; but the foundations of the ancient structure will still exist at a considerable depth under the new street level, as well as under Dolphin-court and the old Dolphin Tavern, as far as the railway arch of the London, Chatham, and Dover line. In the improvements in progress the last vestiges of a curious relic of old London social life will disappear. This relic was originally a bowling or skittle alley in connexion with the Blue Last Tavern, the flooring of which was actually on top of the London wall fragment now being pulled down."



## OBITUARY.

*Henri Lehmann.*—The announcement of the death of Henri Lehmann, at the age of 68, will recall to many English artists a name that for years has been familiar to them as that of one of the famous Parisian painters. In Paris, Henri Lehmann has long held a position of the highest honour, a position to which he was fully entitled, if for no other reason than that he was a consistent and sincere lover of what may be called perfectly correct art, a strong supporter of historical traditions, and, as a professor, an unwavering adherent to a style of art the very opposite of the modern school which, since the advent of the Spanish painters, has made such progress abroad. The younger painters are disposed to regard Lehmann's work as entitled only to the merit of extreme respectability, and it is rarely that the modern artist is found at the Luxembourg with his easel before the picture that we all remember of the group of Italian peasants. But if modern art just now disregards the methods represented and defended by Lehmann, it was only a few years since that Sir Charles Eastlake spoke at a Royal Academy dinner of the honour conferred upon their body by Henri Lehmann exhibiting as he had done that year a portrait, which hung behind the President's chair. It is not, however, alone as a portrait-painter that Henri Lehmann made his fame. The works by which he first attracted public attention were chiefly historical and Biblical subjects, while in later years, in the important decorative paintings of the Hôtel de Ville and the Palais de Justice, all destroyed during the sad days of the Commune, he developed a new and unexpected power. Born at Kiel in Holstein in 1814, at seventeen he went to Paris and entered the atelier of Ingres. In 1835 he exhibited his first work. In 1847 he was naturalised a Frenchman, and in 1864 admitted as a member of the Académie des Beaux Arts, in the deliberations and labours of which his broad-minded culture gave him a foremost place. Henri Lehmann, a naturalised Frenchman, has, it may be mentioned, two brothers naturalised Englishmen; one Mr. Rudolf Lehmann, the highly-esteemed painter; the other, Mr. Frederick Lehmann, a well-known figure in the commercial world.

*Professor Friedrich Drake*, a well-known German sculptor, died at Berlin on the 7th inst., in his 77th year. He was born at Pyrmont, but went to Berlin at an early age. After working as an ordinary carver, he was taken as a pupil by Rauch, who also came from Waldeck. Among his best achievements are his statues of Justice Meuser at Gumbach; of Melancthon and the Elector John Frederick at Wittenberg; of Frederick William III. in the Thiergarten; Bismarck and Moltke in the Berlin Rathhaus; and of the Emperor on the Rhine Bridge at Cologne—the last-named a work which won for its author the Grand Medal at the Paris Exhibition of 1867.

## WORKING OF THE EMPLOYERS' LIABILITY ACT.

GREEN V. CUTLER.

AN important action was tried, under the Employers' Liability Act, at Bow County-court, on Monday, April 3rd. The plaintiff, James Green, an angle-iron smith, sued the defendants, Messrs. Cutler & Sons, of Millwall, for an injury sustained by him while in their employ.

It appeared that in October last the plaintiff was engaged, assisted by a hammerman, in "flattening corners," and the hammerman, in striking the flatter held by the plaintiff, caused a piece to fly off the flatter, which struck the plaintiff's eye. He went to the hospital, when it was found necessary to remove the eye. It was contended, on behalf of the plaintiff, that the flatter was a defective one, it being too short, and, in fact, worn out. Also, that a boy who had been previously working with the plaintiff had been taken away by the defendant's foreman without his consent, thus materially helping to bring about the accident. The plaintiff complained to the foreman about the defective state of the tool, upon which he informed him he must make shift with the same, as the work he was doing was required as soon as possible. The plaintiff, in endeavouring to make shift with the tool, and the boy having been taken away, the accident occurred. It was also contended that angle-iron smiths ought not to make their own tools, but that a new one should have been given to the plaintiff when he made the complaint.

On the other hand, it was contended that the tool was not a defective one, but that the accident was due to the plaintiff's negligence. When he complained to the foreman about the defective tool, an order was given him for steel (which was kept in

store), so that he might make a new flatter when he thought fit. The defendant's foreman had reason to complain of the plaintiff's work, and told him he would have to do it over again. An angle-iron smith is paid according to the work produced, and he has, out of his wages, to pay the persons that assist him with his work. The plaintiff, in order to save time, did not make the new flatter, but continued working with the alleged defective one, and to avoid further expense asked the foreman to remove the boy as he would not require him. Thus the accident occurred. It was also contended by some well-known engineers that pieces must of necessity fly from all flatters, whether new or otherwise, and that therefore it was not owing to the defective state of the tool the accident occurred. Further, that it was the custom for all angle-iron smiths to make their own tools.

The jury, after an hour's deliberation, returned a verdict in favour of the plaintiff, damages 100*l*.

Mr. J. A. Cross appeared for the plaintiff, and Mr. Bompas, Q.C., for the defendants.

## PROVINCIAL NEWS.

*Batley.*—The new cottage hospital at Batley is approaching completion. It stands upon a commanding site near the new Grammar School, and opposite to the Carlinghow railway station. The style of architecture selected by the architect (Mr. Walter Hanstock, of Batley) is of the Renaissance character. The edifice stands in the centre of grounds which have a frontage of 46 yards and a depth of 111 yards. The main façade measures 115 ft., and has a depth of 80 ft. On the plan the building assumes the form of the letter T. The hospital is built wholly of Holmfirth stone, and exhibits some good masonry. All the carved work is by Mr. Harry Home, of Eretor. The ground-floor of the principal front is occupied by a central vestibule. To the right are waiting-rooms, female accident ward, and Board-room; and to the left the matron's room, male accident ward, and male convalescent room. Behind these is a continuous corridor, as well as matron's and servants' bedrooms. Behind, again, are the surgery, matron's store-room, and kitchen offices. The first floor is approached by means of a triple staircase, and contains other wards. Messrs. W. Preston & Sons, of Batley, are the builders; and the entire cost is not expected to exceed 6,000*l*.

*Malton.*—A new block of buildings has just been erected on the site of the old Friends' Meeting-house in Spittle-street, their purpose being to serve as a mission hall and school for adults. For nearly seven years an institution known as the Adult School has been in existence, and has done a good work in the quiet, unobtrusive manner so characteristic of the Society of Friends, by whom, hitherto, it has been principally supported. There are schools for both men and women, and we are told that there are many who are indebted to the Malton Adult School for great improvement not only in their mental but also in their moral condition. The old building was itself possessed of some historic interest. In pulling down an old wall which had formed the end of the house a stone was found bearing the inscription "Anno Domini 1677," and there was also found amongst the foundations a portion of a tombstone bearing date 1691; so that it is reasonable to conclude the old building was one of the oldest Friends' Meeting-houses in the country. It is equally reasonable to conclude that the renowned George Fox, the founder of the Society of Friends, had preached within its venerable walls, for in his evangelising tours, as appears from his journals, he frequently came to Malton. The new buildings include—on the ground-floor a day-school for Mr. F. Rawling, a school for the adults, and a library and class-room adjoining for the use of the latter. Each of the schoolrooms is about 24 ft. by 20 ft., and 13 ft. in height; and the principal entrance to the buildings is from Spittle-street. The Mission Hall is a spacious room on the first-floor, the dimensions being about 50 ft. by 24 ft. and 16 ft. high. The building is built of brick and stone, the style of architecture being that of "Queen Anne." The bottom lights of the windows are glazed with Hartley's rough plate. The work has been executed by the following contractors: Brick and stone, Messrs. H. & W. Oldfield, of Castle Howard; joiners' work and internal stings, Mr. G. Hill, Malton; plastering, Mr. W. Lonsdale, Malton; plumbing, glazing, and gas-fitting, Mrs. Smiddy, Malton; painting, &c., Mr. Walker Widdon, Malton; ironwork, Mr. J. Keenan, Malton. The architect was Mr. J. L. Webster, of Malton.

## STAINED GLASS.

*Bristol Cathedral.*—An addition has been made to the stained glass in this building by the filling in of the south window in the Newton chapel. The window consists of four lights and tracery, and in each of the former has been introduced a subject panel, the four groups being so designed as to embrace the six acts of mercy. The window is in memory of the widow of Mr. John Lucas, and is by Messrs. Joseph Bell & Sons, of College Green.

*Kirkwall Cathedral.*—The Kirkwall Cathedral trustees under deed of mortification of the late Mr. Gilbert Masson, of Mordoun, who left 1,000*l*. for beautifying and repairing St. Magnus Cathedral, having now a considerable surplus in hand, have resolved to have a large window in the east end of the cathedral filled with stained glass, but before doing so they ask the sanction of the Town Council, heritors, and kirk-session of the Established Church. The Council have approved of the plan.

*Radwinter.*—Two two-light windows have just been added to the west end of the Parish Church of Radwinter, near Saffron Walden. They illustrate, by means of four subjects in each window, Baptism and the Holy Eucharist. In the first window Baptism is illustrated by the children of Israel crossing the Red Sea (in the distance is shown the pillar of cloud), also by Noah and his family entering the Ark. Beneath these two types is represented Our Lord's last charge to His disciples to "Go into all the world"; and, lastly, Infant Baptism in a Christian church in the Middle Ages. In the tracery above is the Dove, the emblem of the Holy Spirit. The subjects in the Eucharist window are the Two Spies returning with the Cluster of Grapes, and the Children of Israel gathering Manna in the Wilderness. Beneath these are two subjects illustrating Our Lord's institution of the Holy Eucharist and its Celebration in the Church of Christ. In the tracery is the chalice, and on the scrolls at each side the word "Jesu." Much care was bestowed upon the arrangement of the windows by the Vicar, the Rev. J. F. W. Bullock. The windows are from the studio of Messrs. Isaac A. Gibbs & Howard, of Charlotte-street, Fitzroy-square.

## Books.

*A Hunter's Wanderings in Africa.* By FREDK. COURTENAY SELOUS. London: R. Bentley & Son. 1881.

We have received a copy of Mr. Selous's handsome book, and although we cannot pretend that it has much connexion with the subjects ordinarily treated of in our pages, beyond showing the difficulties under which a substance used in the arts, ivory, is obtained, we cannot refrain from bearing testimony in a few lines to the spirit with which it is written and the fascination it exercises over the reader. It is a narrative of nine years spent amongst the game of the far interior of South Africa, containing accounts of explorations beyond the Zambesi, and full notes upon the natural history of all the large mammals. It is a fortunate thing for England that amongst her sons are to be found men ready, indeed anxious, to brave any difficulties and to meet any dangers for mere love of adventure, ready to leave a luxurious home and loving relations for the pathless wilderness, with its accompanying fears, wild beasts and wilder men. Mr. Selous appears to be of that happy temperament that enables him to find consolation for any disaster in the feeling that it might have been worse; and to consider after being nearly ninety hours without food, water, or protection from the cold during three winter nights, the first hearty meal and a couple of good blankets near a fire so delightful as to be almost a compensation for the hardships he had endured. The author comes of a literary and artistic family, and handles the pen as effectively as the rifle.\* The principal illustrations of the book are the work of his sister, Miss A. E. Selous, which, drawn from the author's oral descrip-

\* Many of our readers will remember one of the author's relatives, Mr. Henry O. Selous, as the painter in earlier life of "Burford's Panoramas," more recently of many pictures, and the designer of the famous "Pilgrim's Progress" Orlans, sent all over the world by the Art-Union of London. And a second, Mr. Angiolio R. Selous, is known as the author of some excellent plays produced by Mr. Charles Kean and by Mr. Pinche, and of the very successful melodrama, "True to the Core," the one satisfactory result of the much-mismanaged T. P. Cooke Trust. The daughter of Mr. A. Selous, Mrs. Fennessey, has made her mark as a sculptor.



tions, give an excellent idea of the incidents set forth.

The fact that Mr. Selous dedicates his book to his friends the elephant hunters, missionaries, and traders of the far interior of South Africa, from whom he "has met with the truest kindness and the most generous hospitality," is a valuable assurance to intending travellers in that distant region of what they may count on finding.

#### VARIORUM.

LAST year's bound numbers of the *Art Journal* form a beautiful volume, fit for the library or the drawing-room table. It includes a dozen page-engravings, the same number of excellent etchings, besides smaller illustrations, and much interesting and instructive reading. A new and improved edition of Collingridge's *City Directory* has been issued. It exhibits a considerable increase in comparison with the size of its immediate predecessor, mainly due to the increasing number of occupiers of offices and small warehouses. New streets of offices have sprung up in various localities, and Leadenhall-market, Wardrobe-chambers, and Fountain-court, Temple, have further augmented this portion of the work by making additional contributions of names. The information supplied in the pages of this Directory respecting the City Livery Companies, their fees, their charities, and also the names and addresses of their Masters and Wardens, are the most complete that can be obtained. The compilers further state that they have brought down their corrections to the very latest hour, and that the latest additions to the Directory include the very useful one of a street index to fire hydrants. The Directory, as a whole, well sustains its high reputation. A writer in "Our Homes, and How to make them Healthy," is strong in his observation as to sanitation and consumption:—"I once visited a new and pretty row of houses in a London suburb to see a young lady there who was suffering from pulmonary consumption. The house was literally saturated with moisture. This patient died from the disease that had been lighted up into activity there. On making further inquiries, I found that in the same row of houses, twenty in number, there occurred within the first two years of their occupation six other instances of pulmonary consumption and fourteen instances of acute rheumatic fever. A patient who was once under my care, and who was a confirmed cripple from rheumatic disease following upon acute rheumatic fever, gave me, in language as simple as it was truthful, the history of her case at its origin. Newly married, she and her husband bought a new house which, in their desire to settle quickly, they inhabited while the walls were still bedewed with moisture. She sickened with acute rheumatism fever, and never fully recovered from its effects. Worse than all, every one of her children,—and she gave birth to seven after her attack,—were affected with rheumatic disease, three dying from heart affection dependent upon the rheumatic constitution. A lesser degree of moisture in a dwelling than is sufficient to produce the above-named acute and serious diseases may be sufficient to cause much painful suffering. In a large number of instances neuralgia and sciatica are either induced directly, or are greatly promoted, by residence in a damp house." *Cassell's Magazine* speaks thus as to female employment abroad:—"In France and Belgium the idea seems to prevail, either to lay up a sufficient provision for the children, or to place them in some business which will support them. Even professional men who have perhaps a sufficient income for their present needs, but not enough to endow their daughters, will often engage in business for their sake. Of this I have seen many instances. A gentleman with a large family of daughters, having come into possession of a small fortune, has invested it in a large grocery business. His daughters, though beautiful and accomplished, serve in the shop, and they are not the less thought of in society for doing so. The same thing is done when a reverse of fortune is experienced. I know a hosiery and trimming shop which is kept by the daughters of a lawyer. They are making a comfortable living, instead of starving in genteel poverty, as is often done by ladies placed in similar circumstances in our own country. It will thus be seen that in the countries I have mentioned there are none of those foolish prejudices against trade which are now fortunately disappearing from English minds. In Belgium, whence I write, the employment of

women in shops and offices is much more general than in England. It would be difficult to mention any kind of shop where they are not to be found. At the railway stations they serve not only in the refreshment-rooms, but in the ticket office. While I write, instances of women occupying themselves in an unusual way, at least to our ideas, crowd upon my mind." Messrs. George Bell & Sons have in the press a somewhat notable book. For many years Mr. Edwin W. Streeter has been engaged in collecting materials for something like an authoritative history of the world's famous diamonds. In collaboration with Mr. Joseph Hatton and Mr. A. H. Keane (a well-known Oriental scholar) he has completed a volume entitled "The Great Diamonds of the World."—"Cassell's Concise Cyclopædia," the publication of which in parts is just now commenced, is intended to be complete in one volume, and to meet the wants of that large number of persons who cannot afford to purchase an expensive work in many volumes. It will include a number of small illustrations.—Laxton's Price-Book for 1882, the sixty-fifth edition, shows the continuance of that careful superintendence which has given it its established character. Amongst the additions is a section devoted to the subject of sanitary work.

#### Miscellaneous.

**Lead Poisoning in Factories.**—We get a paragraph on this subject from the *Lancet*. "Public attention has at length been aroused to the fact, well known to the profession, that the provisions of the Factory Laws with respect to workers in lead are either inadequate to prevent cases of poisoning by the metal, or are disregarded by factory owners and their employees. On Saturday last an inquest was held at Shoreditch on a young woman, twenty-seven years of age, who succumbed to lead poisoning after but ten months' exposure to the deleterious substance in the factory in which she worked. Dr. Forbes, of the Shoreditch Infirmary, stated during the inquiry that he had admitted into that institution sixteen cases of lead-poisoning in a few months, and in one case a girl had been employed at the work for two weeks only, and absorbed so much poison that she lay between life and death for six months. We believe that there are in existence very stringent regulations as to workers in lead; but these cases, and the numberless instances of lead paralysis arising in consequence of exposure to the powder-dust in white-lead factories especially, that come under the notice of physicians to hospital outpatient departments, afford evidence of culpable laxity somewhere. We are glad to see that Mr. Broadhurst has brought the subject under the notice of the Home Secretary, and we may hope to learn that, without delay, a Government inquiry by the medical officers of the Local Government Board will be instituted into the precautions taken at these factories to prevent the dissemination of the deadly dust."

**New English Church in Rome.**—The corner-stone of the new English Church in the Via Babuino, dedicated to All Saints, which is to take the place of that outside the Porta del Popolo, in which the English congregation has met since 1818, has been laid by his Excellency Sir Augustus Paget. The area was crowded, not only with the members of the Church of England, both English and American, in Rome, but with many members of the Protestant denominations now established here, and numbers of Italians. From the hoarding were flying English, United States, and Italian flags, together with the red and orange flag of the city of Rome. The church was designed by the late Mr. Street. Upon the foundations,—always a most costly affair in this city,—60,000*l.* have been spent. The site cost about 6,000*l.*, and the committee have 5,000*l.* in hand. About 70,000*l.* more are wanted to complete the building.

**Middlesbrough.**—Mrs. Caan has given a stained-glass window to the Church of St. Peter's, Middlesbrough. Messrs. Isaac A. Gibbs & Howard, of London, are the artists, and the subjects illustrate Christ blessing Children, and the Raising of Jairus's Daughter.

**Art Union of London.**—The distribution of prizes will take place at the Royal Adelphi Theatre, on Tuesday, the 25th inst.

**Royal Academy.**—The private view is fixed for Friday, the 28th inst.

**Street Improvements in Edinburgh.**—The improvements made on many of the thoroughfares throughout the city of late have added much to the convenience and comfort of the community. The carriageway of Fountain-bridge, for example, which was formerly macadamised, and in wet weather was usually very dirty, has recently been paved from Whitebank westwards to Angle Park, and when the whole of the improvement at Mr. M'Ewan's ground, including the widening of the street, has been carried out, it will certainly add to the amenity of the locality. The cost of this work will be about 2,000*l.* The carriage-way at Hope Park and Causewayside, one of the oldest thoroughfares in the city, and the bad condition of which had long been a cause of complaint, has now been paved from Gifford Park to the Grange-road, a distance of nearly half a mile. This operation, which is just being completed, and will cost about 3,300*l.*, cannot fail to be appreciated, as the old macadamised surface was a great source of annoyance, especially in windy weather, in consequence of the clouds of dust flying about. A very much-needed improvement has been carried out at St. Leonard's-hill, which has been paved in a satisfactory manner, the joints of the stones being filled in with asphalt. Formerly the road was macadamised. Many of the private streets and roads in the city have also received attention from the Town Council, and have been, or are being, put in good order. The whole of the roads in the Merchiston district are being macadamised, and rolled with the 20-ton steam roller.

**Old Dunnikier House, Kirkcaldy.**—A correspondent of the *Scotsman* says:—"This fine old mansion, a conspicuous object in the High-street of Kirkcaldy, and for more than a century the residence of the Oswalds, is about to undergo extensive alterations, with the view of converting the ground-floor into shops, rather urgently required for the increasing needs of the town. This will necessarily impair, on the street front, at all events, the antique character of the building, which is a sort of representative seventeenth-century house. It is a large and imposing dwelling, particularly at the back (which is really the front), partaking a good deal of the Elizabethan type of architecture, with two curved gables to the street, and surmounted by an octagonal dome or cupola which towers above the surrounding houses. The staircase is very handsome. It is oak, with massive balusters, and nearly 100 steps. The principal rooms are wainscoted with panelled oak, and until lately several of the fireplaces were lined with painted Dutch tiles of the period. By some it is thought that the builder was Captain James Oswald; others suppose that it was erected by his father-in-law, Provost Matthew Anderson, probably about 1640-60, as a dowry for his daughter. Some historical interest also lingers about it. Adam Smith, who lived just across the street, was a frequent visitor, Mr. Oswald of that day (the Right Hon. James, M.P., and a Lord of the Treasury) being his intimate friend."

**The Victor Emanuel Memorial.**—Our correspondent from Rome adds to his notes on the competition given in our last the following information:—"1st Prize, 50,000 francs. No. 2491. Design for the systematising of the remains of the Theatre of the Baths of Diocletian (to which I referred in my notes) embracing a triumphal arch, column, &c. The author is said to be a student of the French Academy—(M. Menot). 2nd Prize, 30,000 francs. Authors, Messrs. Ferrari Ettore e Pincentini Pio. Contractors, No. 194. This is the design to which I referred as proposing to widen two sides of the Corso and heap up terraces and fountains to hide the Capitol. 3rd Prize, 20,000 francs. No. 2591. Alteration of the Piazza di Venezia and monument in centre."

**Warley (Wigan).**—New Board School, consisting of three departments, viz., for boys, girls, and infants, with class-rooms, lavatories, &c., have been opened here. There are also teachers' residences, spacious play-grounds, boundary walling, and out-buildings. The contract for the whole of the work was 1,831*l.* The work has been carried out by Messrs. Stockton & Son, builders, Oldbury, from plans and under the superintendence of Mr. R. F. Matthews, architect, Birmingham.

**Professor Adolphe Menzel** will send a picture to the Exhibition of the Royal Society of Painters in Water Colours.



**Fog and Smoke.**—The Medical Officer of Health for Marylebone, in his "Sanitary Chronicle," says,—"The repression of fog, or, rather, the purifying of the air from sulphur compounds which are slowly corroding alike the finest works of art and our own masonic members, though presently needed for comfort, and even existence, yet with the present appliances and ideas, it seems a hopeless task to deal with; the more so, since those who have pretended to speak with authority upon the matter have turned their attention almost entirely to the visible and palpable smoke, neglecting the invisible vapours which do the main injury. A greenhouse in the parish emitted black smoke; the neighbours complained; the owner then substituted coke for coal. Now the chimney poured out in bountiful profusion carbonic acid, carbon oxide, and sulphurous gases, all perfectly invisible; but the complaints were more bitter, and the first evil was preferred to the remedy, for the palpable and thick smoke could be, in some degree, excluded, but exclusion of the subtle gases was impossible. It is therefore evident that so-called smokeless fuel, and even the use of ordinary coal-gas itself (the latter containing 17 grains of sulphur per 1,000 cubic feet) would by no means purify the London atmosphere. The solution of the problem demands an entire revolution of all our domestic and social habits, and the utilisation of some combustible product which contains no sulphur. That this revolution will take place within the next fifty years appears in the highest degree improbable."

**Statue of Burns in Dumfries.**—Last week a statue of the poet Burns was unveiled in Dumfries by Lord Rosebery, and the event was made the occasion of a national demonstration. At one o'clock a large public procession paraded the streets of the town. It was composed of representatives of all the trades and societies of the counties of Kirkcudbright and Dumfries. At three o'clock the unveiling ceremony was commenced. The statue is placed on the space in front of Greyfriars Church. It is cut in Sicilian marble, and was executed at Carrara from the model designed and prepared by Mrs. D. O. Hill, and it stands on a pedestal of gray-stone at a height of 5 ft. from the ground. The bard is represented as resting easily on an old tree root. In his left hand he holds a cluster of daisies; the head is turned towards the right shoulder, with the eyes gazing into the distance. Near by lies a collie dog, a broad bonnet half covering a well-thumbed song-book, a rustic flageolet being added in further suggestion of this ploughman's relations with the Muses. The costume other than the plaid is that derived from the well-known Nasmyth portrait, which has also been followed in the features.

**Epping Forest.**—It is understood that her Majesty will travel by train to Chingford Station, and thence visit the numerous romantic portions of the forest which are reached by the ascent leading to the Royal Forest Hotel. A map has just been issued by Mr. Henry Sell, Bolt-court, Fleet-street, showing at a glance the whole area of the forest, extending from this point to its extremities in each direction, together with the new roads, the Royal or "Green" Ride, which, when completed, will traverse the entire extent of woodland and glade, the Comnaught Waters or series of lakes, and the new roads, paths, and improvements as arranged by the Commissioners to the latest date. As an appropriate guide this map will be found useful.

**Protest against the Removal of the Old Edgystone Lighthouse.**—At a recent meeting of the Catewater Commissioners, the Chairman (Mr. J. Bayly) remarked that he had lately been in communication with Sir John Lubbock respecting the removal of the Old Edgystone Lighthouse. Sir John expressed it as his opinion that it was a great pity that the structure could not be allowed to stand in its original place as a mark of Smeaton's great engineering work, without having to be altered or removed. In his letter Sir John said, "I hope ere long the Government will appoint an inspector of ancient monuments, and in this way we shall be in a better position to prevent such acts of vandalism."

**Electrical Engineers.**—We understand that the Hammond Company have started an Electrical Engineering College in order to provide a thorough scientific and practical training necessary to young men of good education who wish to become electrical engineers.

**The Dawson Memorial Statue, Birmingham.**—A meeting of the general committee in the matter of the George Dawson Public Memorial was held on Wednesday night, to receive and consider a report from the Executive Committee embodying a proposition by Mr. Woolner, R.A., the sculptor of the statue. Mr. Sam Timmins presided. Mr. G. J. Johnson read a report from the officers of the committee, who stated that in compliance with the resolutions of the General Committee on the 8th of November, they prepared a formal request to the Town Council that the Council should instruct the Public Works Committee to allow certain alterations, which had been suggested by Mr. Woolner, to be made. After a formal communication with the Public Works Committee respecting the alterations, Mr. Woolner came down to Birmingham, and after again inspecting the statue, met the officers of the Memorial Committee. The result of the conference between them was that Mr. Woolner considered that alterations to the present statue would remove certain minor objections as to costume, but would not remove the principal objections that had been made. Notwithstanding, Mr. Woolner was quite willing, if desired by the subscribers, to make these alterations. But he suggested that he would execute a larger statue in bronze for the cost of the material and the casting, which he estimated at about 600*l.*, taking nothing for his own work. Towards the 600*l.* there would be about 200*l.* available, being the estimated balance after paying Messrs. Barney for the building work of the canopy. The proposal would, therefore, involve the raising of about 400*l.* Mr. Johnson moved that the report be received, and this was carried.

**The Edison Electric Light** is now being tried along the whole length of the Holborn Viaduct, and in many of the shops and warehouses on that thoroughfare. In each of the lanterns which surmount the lamp-posts are two of the incandescent lights in vacuo. There are nearly 1,000 lights in all. The district lighted is supplied by four circuits. In the first circuit there are sixty-six street lights and seventy-eight lights, of sixteen-candle power each, distributed in eleven buildings; in the second circuit, forty street lights and forty-nine lights in seven buildings; in the third circuit, twenty-four street lights, twenty-six lights in the Imperial Hotel, six in a shop, sixty-eight in Messrs. Spiers & Pond's Hotel, of which twenty are in the restaurant, nine in front of the London, Chatham, and Dover Railway station, and fifty-two in six warehouses; and, in the fourth circuit, thirty-one street lamps, 147 sixteen-candle and fourteen eight-candle lamps in the City Temple, seven sixteen-candle and four eight-candle lamps at No. 31, 216 sixteen-candle and sixteen eight-candle lamps in the company's central station, and nine sixteen-candle and twenty-two eight-candle lamps in the Viaduct Tavern. In this circuit also will be placed fifty sixteen-candle lamps, which are to be tried in the General Post-office.

## TENDERS

For the first section of the additions to the Eastern Counties Asylum for Idiots, Colchester. Mr. R. F. Valance, architect:—

Stone Floor Slates and Blue Bricks.		
Thomas Boyd, Hackney .....	£3,590 0	£3,590 0
D. C. Jones & Co., Gloucester ..	2,961 0	2,942 0
H. Rumsdale, Ealing .....	2,767 0	2,776 0
C. H. Oldridge, Colchester .....	2,772 10	2,737 10
Oliver T. Gibbons, Ipswich .....	2,750 0	2,700 0
George Lee, Colchester .....	2,650 0	2,567 10
N. Saunders & Son, Dedham .....	2,555 0	2,524 0
H. Everitt & Son, Colchester .....	2,550 0	2,526 0
R. S. Smith, Ipswich .....	2,547 19	2,547 19
G. Grimwood & Sons, Sudbury ..	2,495 0	2,495 0
F. Dupont, Colchester .....	2,490 0	2,452 0
Geo. Dobson .....	2,486 0	2,449 0
E. Bado, Exeter (accepted) .....	2,300 0	2,263 0

For additions, &c., to the King of Prussia, Deptford, for Messrs. Fox & Sons, Mr. St. Pierre Harris, architect:—

Amer .....	£234 0 0
Bridel .....	312 0 0
A. & F. Smith .....	300 0 0

For new roof and attics to Start's Hill, Farnborough, Kent, for Mr. J. L. Lovibond, Mr. St. Pierre Harris, architect:— Taylor & Son, accepted.

For two stables, coachhouses, and coachman's dwellings, Kinnerton-street, Wilton-place, Messrs. A. & C. Harrison, architects:—

C. Wall .....	£1,240 0 0
Nash .....	1,070 0 0
Sharnor .....	1,036 0 0

For additions to the Central Schools, Brimington, for the Brimington U.D. School Board. Messrs. Rollinson & Son, architects:—

John Cropper .....	£847 4 6
Joseph Cropper .....	833 10 0
Chadwick & Co. ....	630 0 0
Drabble .....	601 0 0
Forrest .....	598 0 0
Margeson .....	540 0 0
Wright .....	575 0 0
Handby .....	568 0 0
Gough & Glossop .....	560 0 0
Gough, Chesterfield (accepted) ..	542 10 0

For a church at Temple Normanton. Messrs. Rollinson & Son, architects:—

Messrs. Waller, and Plasterer's Work.		
Hopkinson .....	£712 0 0	
Chadwick & Co. ....	700 0 0	
Aikew .....	389 0 0	
Forrest .....	684 0 0	
Bingham .....	651 0 0	
Fisher Bros. ....	647 0 0	
Langley .....	639 0 0	
Wright .....	637 0 0	
Heath .....	690 0 0	
Margeson & Sons .....	585 0 0	
Handby .....	557 0 0	
Roole, Hasland (accepted) .....	556 0 0	

Carpenter, Joiner, &c., Work.		
Pitch Pine. Oak.		
Fisher Bros. ....	£281 16 9	£201 16 9
Forrest .....	639 0 0	583 7 0
Meskin .....	457 16 0	497 16 0
Smedley .....	424 0 0	454 0 0
Statham .....	415 0 0	478 0 0
Davenport .....	417 0 0	393 0 0
Valence .....	413 0 0	448 0 0
Chadwick & Co. ....	393 0 0	416 0 0
Langley .....	389 0 0	409 0 0
Rollinson .....	378 0 0	410 0 0
Roole .....	354 0 0	400 0 0
Brown, Hasland .....	351 0 0	401 0 0
Handby .....	347 0 0	392 0 0

\* Accepted for pitch pine.

For the erection of a house in Church-road, Acton, for Mr. Joseph Bick. Mr. Edward Monson, jun., architect:—

Penny & Co., Ealing .....	£1,111 0 0
F. R. Tozer, Notting-hill .....	9 9 15 0
C. Maton, Kew .....	885 0 0
T. Nye, Ealing .....	840 0 0
M. W. Rowles, Acton .....	825 0 0
J. Dorey, Brentford .....	812 0 0
J. Parker, Acton (accepted) .....	958 0 0

For a dwelling-house and shop, 468, Bethnal-green. Messrs. A. & C. Harston, architects:—

Jackson & Todd .....	£297 0 0
Johnson .....	587 0 0
Sharnur .....	883 0 0
Farish .....	869 0 0
Cox .....	844 0 0
Sergeant .....	797 0 0
Russell .....	767 0 0

For new police-station and lock-up, Fakenham, Norfolk, for the magistrates of the county, Mr. R. Makiwane, Phipson, architect:—

Barnard, Norwich .....	£1,020 10 0
Grimwood, Weybread .....	971 0 0
Mayer, Dereham .....	977 14 0
Bardell Bros., Lynn .....	950 0 0
Smith, Fakenham .....	913 0 0
Tarver, Fakenham .....	898 0 0
Tutthill, Fakenham .....	785 0 0
Dawes Bros., Lynn (accepted) ..	765 0 0

For alterations and additions to stabling in Windsor Castle-yard, Hammersmith, for the London General Omnibus Company (Limited). Mr. Alfred Toot, architect. Quantities supplied by Mr. A. J. Bolton:—

Apsey & Son .....	£216 11 0
Garrud .....	823 15 0
Kilby .....	818 0 0
Niblett .....	797 0 0
Richens & Mount .....	789 0 0
Genry .....	745 0 0
Beale .....	732 0 0
Wheeler .....	730 0 0
Burch & Moor .....	697 0 0
Parker (accepted) .....	639 0 0

For taking down and rebuilding the Horseshoe Inn, Kintbury, Berks, for Messrs. Hawkins, West Mills, Brearley, Newbury. First portion of works. Mr. Money, architect. Quantities by the architect:—

C. Broaden, Kintbury .....	£745 0 0
R. N. Hastings, Hungerford .....	620 0 0
J. Woodridge & Son, Hungerford ..	670 14 2
A. Bailey, Thatcham .....	498 0 0
D. Pope, Woodhay .....	464 0 0
J. Bance, Kintbury .....	461 0 0
George Elms, Stockcross .....	428 0 0

For sewerage, draining, &c., Ashfield-road and Smith-street, Urmston, for the Barton-upon-Irwell Sanitary Authority. Quantities supplied by the engineer, Mr. John Price:—

S. Holt, Newton-leath .....	£249 8 0
E. Bird, Charlton .....	363 4 6
J. Oaks, Kearsley .....	325 13 0
M. Naylor, Hulme .....	300 17 0
J. Randall, Westate (accepted) ..	273 4 3

For two shops at High-road, Kiburn, for Mr. D. J. Pash. Mr. Walter Graves, architect. Quantities by Mr. H. E. Pollard:—

Spencer & Co. ....	£1,555 0 0
Swain .....	1,520 0 0
Vears & Co. ....	1,353 0 0
Hallett & Stewart .....	1,312 0 0
Stimpson & Co. ....	1,313 0 0
Ward & Lambie .....	1,297 0 0
Beach .....	1,235 0 0
Anderson .....	1,208 0 0
Densford .....	1,170 0 0
Kelond .....	1,170 0 0
Niblett .....	1,147 0 0



For the erection of Board schools to accommodate 424 children, masters' rooms, &c., near Shanklin, Isle of Wight. Mr. James Newman, architect:—

Tiled Roof.	Slated Roof.
D. C. Jones & Co. ....	£5,250 0 0
John White .....	4,985 0 0
A. A. Wrenham .....	4,600 13 6
James Hayden .....	4,400 0 0
Isaac Barton .....	4,344 0 0
George Hayes .....	4,240 0 0
Wm. Newman .....	4,229 0 0
Alfred Young .....	4,100 0 0
	3,990 0 0

For taking down eight houses, shops, and outbuildings in High-street, Notting hill, and the Mall, clearing site, building vaults, and carrying out other works in connexion, for the Vestry of St. Mary Abbots, Kensington. Mr. W. Weaver, surveyor:—

G. P. Kearley .....	£1,198 0 0
Nowell & Hobson .....	1,183 0 0
Munday & Sons .....	1,130 0 0
G. Aldred .....	1,85 0 0
Rogers & Dickens .....	1,030 0 0
J. Meares (accepted) .....	940 0 0

For alterations to the King's Arms tavern, Kingland High street. Messrs. Kirk & Walters, architects:—

Mark .....	£284 0 0
Temple .....	845 0 0
Younes .....	640 0 0
Williams .....	613 0 0
Jackson & Todd .....	613 0 0
Anley .....	610 0 0
Burmer (accepted) .....	585 0 0

Accepted for a public school, for the School Board of Glasgow. Mr. T. L. Watson, architect:—

Barclay Dismore (Masonry) .....	£3,926 12 10
Alex. Livingstone (Wright) .....	1,880 3 4
Henderson & Arnot (Plumbing) .....	343 10 0
William Lattie (Slating) .....	307 18 0
Rigby & Tomner (Plastering) .....	309 6 8
Gairbairn & Winton (Tiling) .....	240 0 0
G. & J. Rae (Glazing) .....	228 0 0
D. & G. Graham (Guttering) .....	94 2 3
J. Combe & Son (Roofing) .....	140 0 0
J. McCallie & Co. (Ventilating) .....	124 17 4
Brown & Whitehead (Smith's Work) .....	251 4 8
W. McGeach & Co. (Ironmongery) .....	91 6 7
McFarlane & Smith (Painting) .....	119 0 0
M. McCulloch & Co. (Cast Iron) .....	75 15 0

For new premises, Peckham, for the London and South-Western Banking Company. Messrs. Edmonson, architects. Quantities by Mr. Mark King:—

Higgs & Hill .....	£2,140 0 0
Boyer .....	2,900 0 0
Steel Bros. .....	2,885 0 8
Nye .....	2,470 0 0
Boice .....	2,469 0 0
McLachlan & Sons .....	2,446 0 0
Kilby .....	2,337 0 0
Sn-pherd .....	2,340 0 0
Smith & Son .....	2,327 0 0
Shapley & Sisford .....	2,353 0 0

For new flooring, plastering, and seating, in wainscot, to the church of All Saints, Beiton, near Great Yarmouth. Messrs. Eddle & Oley, architects:—

Davey .....	£470 0 0
Newby .....	459 0 0
Woodruff .....	447 0 0
Cornack & Gayer (accepted) .....	404 0 0

For new billiard-room and additions to Seafield House, South Beach, Great Yarmouth, for Mr. W. Holt. Messrs. Eddle & Oley, architects:—

J. Leggett .....	£400 0 0
E. H. Jones .....	375 0 0
W. Wright .....	388 13 0
T. Brown (accepted) .....	362 0 0

For villa residences, Freemantle, Southampton. Messrs. J. G. F. Cole & Son, architects:—

H. Wood .....	£750 0 0
Holt .....	743 0 0
Stevens & Son .....	735 0 0

For widening and for alterations to Norcott Lane, Tylehurst, for the Tyeburth-road committee:—

Middie .....	£583 1 6
Alcock, Camberley .....	583 0 0
Oliver .....	558 15 0
Culter .....	550 0 0

For the Royston Lock-up. Mr. Urban A. Smith, architect:—

W. Gibbons & Co., Buntingford .....	£3,970 0 0
J. L. Glascock & Son, Bishop's Cleeve .....	3,850 0 0
Wade & Edey, St. Neot's .....	3,610 0 0
G. Warble, Basingstoke .....	3,563 0 0
S. Redburn, Stotfold Baldock .....	3,563 0 0
A. Bunting, St. Ives .....	3,450 0 0
Willmott & Son, Basingbourne (accepted) .....	3,340 0 0

For the erection of an infants' school, Oorpart-street, Southampton, for the Southampton School Board. Mr. E. J. Howell, architect:—

Bailey .....	£2,291 0 0
Brimon & Borm .....	2,178 0 0
Stevens & Son .....	2,158 0 0
Rowland .....	2,098 0 0
Bull & Sons .....	2,043 0 0
Dyer .....	2,225 0 0
Crook (accepted) .....	1,937 0 0

For the construction of a sewer at Crouch-end. Mr. E. de Courcy-Mead, surveyor:—

Wilkes & Co., Elabopgate .....	£249 0 0
Ford & Everett, Westminster .....	741 5 8
Jackson & Son, Finsbury Park .....	730 0 0
Strachan & Co., Wood-green .....	707 19 4
Adams, Hackney .....	695 0 0
Bloodfield, Tottenham .....	633 13 8
Nichols, Wood-green .....	630 0 0
Hart, Clapham .....	598 0 0
McDowell & Dawson, Stoke Newington .....	598 0 0
Dunmore, Crouch-end (accepted) .....	581 0 0

For the erection of bus-stands at Horse-ridge, for Mr. J. M. Broad. Mr. Fred. H. Stringer, architect:—

Macfarlane Bros. (accepted) .....	£269 13 0
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For the ventilation of the ball-room, tea-room, staircase, &c., of the Northern Meeting-rooms, Church-street, Ipswich, for the ventilation committee. Mr. A. H. Henderson, architect:—

Alex. Mackay, Ipswich (accepted) .....	£269 13 0
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For coachhouse, &c., in Charles-new, Gower-street, for Messrs. Wolfe & Son. Messrs. Shoppes, architects. Quantities by Mr. S. Young:—

F. W. Cowper (accepted) .....	£1,857 0 0
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O. S. (we cannot repeat) lists of tenders. Names should be clearly written.—A. T. T. (say has come out so badly that it must be redrawn).—O. S. (letter is not before us).—E. W. (try the German Embassy).—T. H. W. T. T. B.—H. W. K. H.—H. R. O.—F. A. B.—H. B. F. H. B.—A. H.—J. A.—J. O. T.—W. P.—J. J. B.—A. R. H.—F. C. W. B. & Son.—W. & L.—R. F.—T. C.—W. T.—C. H. F.—H. A. & Co.—W. J. Newell.—D. H.—J. W. A.—A. H.—T. C. U. B.—D. W.—General F.

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WESTWOOD GROUND,  
Box Ground, Combe Down,

Corsham Down,  
And Farleigh Down.

RANDELL, SAUNDERS, & CO., Limited,  
Corsham, Wilts. [Advtr.]

#### Box Ground Stone.

Is the best for use in all exposed positions, being a well-known and tried weather stone.

50,000 feet cube in stock.

PLOTOR & SONS,  
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# The Builder.

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SATURDAY, APRIL 22, 1892

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### Chaldean Art.



FROM the lowland-marshy alluvial region of the Tigro-Euphrates delta have come some very valuable records of the most primitive population of Chaldea. For some years a warfare has been raging between two rival parties of Assyriologists as to the situation of the two primitive provinces of the land of Chaldea. The earliest records which have been recovered, the rude semi-hieroglyphic brick legends, all give the early kings the title of ruler of the lands of Sumir and Akkad; and it is only by means of inscriptions recently discovered by Mr. Hormuzd Rassam at Babylon and in the treasure-chamber at Abbo Hubba, the site of the ancient Sippara, that we have been definitely able to fix the situation of these two provinces. It is now shown clearly that Akkad, or, as the name means, the Highland, was the region of Upper Babylonia, in which were the ancient cities of Sippara, the Sepharvaim of the Bible, and Agane, the primitive centre of the Semitic rule in Chaldea; while Sumir was the southern region, the land of the delta, and, as M. Lenormant has shown, was identical with the "land of Shinar," in which the first post-diluvian inhabitants of the land settled after their descent from the "mountain of the East." It is in this region that we find the most primitive cities of Chaldea, and it is in this region that all the traditions of the childhood of Mesopotamian civilisation are located. It was in this region that the legends placed the dwelling-place of Xisuthrus, the Chaldean Noah, who dwelt in the Isle of Immortality, situated "at the mouth of the rivers." It was here that the Annetodus Oannes, the mystic fish-man,—the Chaldean Dagon,—whose form appears frequently in Babylonian-Assyrian art, first imparted to men the rudiments of arts, science, and letters, and laid the first germs of the culture and civilisation which, in after-time, became the glory of Nineveh and Babylon. The explorations carried out on the ruins of Ur (Mugher), Erech (Warka), Senkeresh (Larsa), and other primitive cities in this region, by Messrs. Layard, Loftus, and Rawlinson, have shown us how massive and time-defying are the edifices of the primitive builders of Chaldea.

The discovery of painted and decorated chambers at Ur and Erech and of Nipur (Niffer), and of neatly-engraved gems and cylinder seals of Urukh or Likkagas, the Orchamnes of Ovid, one of the most ancient kings of Chaldea, served

to show that these primitive Chaldeans had mastered the rudiments of art. But the discoveries now made by M. Sarzec in the mounds of the Tel-Ho, on the Shat-el-Hie, furnish us with examples of Chaldean art far in advance of any of the rude examples obtained by former explorers, and which tend to show that, close upon thirty centuries ago, the sculptors and bronze-workers of this primitive land had made great advances in art and art-work. Mr. Rassam, in a lecture before the Victoria Institute, which we have reported in these columns, gave an account of the site of this primitive city, and described the monuments he saw there. The explorations carried out by M. de Sarzec, the French Consul at Bassorah, for the French Government, have been most astonishingly successful in the recovery of interesting and valuable records. The mound of Tel-Ho is situated on the Shat-el-Hie, or River Hie, an ancient navigable canal, which joins the Tigris and Euphrates in their lower course. Leaving the former at Kut-el-Amarah, and taking a south-westerly course, it enters the Euphrates nearly opposite the ruins of the Ur. It forms, therefore, a diagonal, bisecting the province of Samir or Shinar, and any city situated on its banks would be in close proximity to the other ancient towns of the land. The mound of Tel-Ho is situated on the north bank of the canal, and about half way between the two great rivers. From time to time, European and Arab explorers have obtained from this site bricks and cones, and two statues out in black basalt; and shortly before his death, the late Mr. George Smith obtained some curious bronze statues, which are now in the British Museum. The inscriptions upon these objects gave the name of this ancient city as Zirgalla, that is, the "City of the Great Light," and the dedications, &c., proved that it was one of the great centres of Chaldean fire-worship. This fact is all the more interesting when we find that it was also the seat of the earliest "metal-workers' colony" in the land. From the explorations made on this site, M. de Sarzec has obtained statues of various sizes out in black granite, basalt, porphyry, in bronze and terra-cotta, and numerous inscribed records. The majority of these records were found in the ruins of an ancient palace and temple, and the valuable collection has recently been acquired by the French Government for the Musée du Louvre. The inscriptions on these records belong to the most primitive type, and contrast strangely with the very advanced character and finish of the art. The greater number bear dedications to the patron deities of the city by a monarch named Gudea, who was the son of Dungi, and grandson of Urukh, or Likkagas, one of the earliest of the post-diluvian kings of Chaldea. The first monument which we may notice is a seated statue of a priest or king, which is out with the most careful finish out of diorite. The head of the statue is unfortunately lost, but the remainder of the work is in excellent preservation. It has been suggested by M. Menant that this is the

statue of an architect or geometician, as on the knees of the seated figure there is a stone tablet on which is sketched the plan of some edifice or some geometrical problem. This plan or figure is also found on some tablets brought by Mr. Rassam from the site.\* There is, however, no reference in the inscription to the person holding any such appointment, but on other records persons who are sculptors and wise men are mentioned.

The figure is seated with the hands folded on the breast, and is clad in a long robe to the ankles. This robe is of very primitive cut, and could have been little more than a large sheet. It is worn so as to cover the left shoulder and arm, leaving the right arm free. The feet are bare, and are most carefully out, the toes and muscles being finished very accurately. The lower part of the dress and the stone or seat on which the figure is seated are covered with a long inscription out in very archaic characters. This inscription contains the names and titles of many of the ancient Chaldean deities, and is a votive offering by Gudea patesi (viceroys) of Zergalla to the god Nergal. The head of the statue being lost, it is a little difficult to judge the type of the nationality to which the person represented belonged. This loss is, however, fortunately remedied by other monuments recovered, first by a beautifully-out head of a porphyry statu, which has been recovered by M. de Sarzec, and also by the bronze statues of fire-priests obtained by Mr. Smith.† In the first example we have one type of features presented, and one which serves to connect the person represented with the Elamite and Sasanian inhabitants on the eastern bank of the Tigris. Indeed, if this head, an excellent reproduction of which by heliography appears in the *Gazette des Beaux Arts* for December, is compared with the bas-relief representations of Elamites given in the sculptures from the palace of Sennacherib at Nineveh, and now in the Koyunjik room of the British Museum, a very close agreement will be found to exist. In both the earlier representation from Zergul and in the Ninivite bas-reliefs the figure is represented as wearing a cap with a decorated turban worn round it, while the head-dress and the costume are quite in accord with the figures on an ancient seal in the British Museum. A second type of features is presented in the bronze statues. Here we have a long-bearded face with high prominent cheek-bones, and a close resemblance to the Turcoman type, while the other beardless type is certainly Ugro-Finnic, and both types clearly show that we have a primitive population of Tartar origin. Indeed, no more striking proof could be brought forward of the Turanian origin of the primitive inhabitants of Chaldea. One other statue or monument requires to be mentioned before we

\* We hope shortly to be able to give a description of these and other plans and drawings found on the recently-discovered monuments of the ancient Chaldean cities.

† Now in the British Museum, and figured in his "History of Babylonia."



proceed to state some of the important facts which may be gathered from the monuments of primitive Chaldean art. It is the statue in alto-relievo of a personage draped in the same manner as the other, but its mode of cutting and work furnishes us with some glimpses of the development of the art of sculpture in Chaldea. This statue has been cut out of a block of diorite, and exhibits a certain crudity compared with the other examples. A block of diorite has been chosen which, by its natural shape, could be turned into a statue of the human figure. Prominent parts of the surface have been utilised for the carving of the arms, and the trunk is that of the natural stone rounded, while for the extremities, by cutting away portions, the feet have been made to appear prominent below the long robe. Indeed, this a very valuable and interesting record of primitive art, as indicating the transition between sculpture in high relief and in the round. We have here examples but one step removed from *bastole* or *astaroth* figures of the Phœnician and Early Greek, or the Palladium of the Trojans. The statue of a goddess in the British Museum bears a remarkable resemblance to the rude figures from Hisarlik, discovered by Dr. Schliemann, and which were, no doubt, copies of the celebrated *Palladium*, and which, like the figures of the Ephesian Artemis and the Hittite goddess, were at one time roughly-shaped conical boulders. The seated figure which has come down to us is a similar work to the only statue mentioned by Homer. In the sixth Iliad the procession bears to the temple of Athens the sacred veil, where it is placed by the priestess Theano on the knees of the statue of the goddess. The statue must therefore have been a seated one, such as we have in the Chaldean example. The rude works, such as the statue of a goddess, dedicated by Gudea, now in the British Museum, or the bronze figure of the mother goddess, the Babylonian Cybele, which was a votive offering of Kudur-Mabug and his son, in the twentieth century B.C., are but one step removed from the *dairala* which Pausanias saw in the Greek temples. It was only by degrees that they began to represent the human form at all, and it was long then ere they assumed the character of works of art. It has always been the same in the history of religious art, and it is curious to see how rarely religious worship and true beauty have been associated together in images. From the palladium of Troy to the icons of the modern Greek Church the same fact is prominent. Now, as we come to consider these valuable examples of Chaldean art it soon becomes apparent that they occupy an important place in the history of Western Asiatic art. In the first place, when we come to compare them with the art exhibited on the seals and cylinders we see a very marked agreement. The attitude and pose of the figures have always been the same; with folded hands the gods receive the worshippers, seated on rude thrones. The more advanced example, dating from the ninth century B.C., furnished by the bas-relief from Abbo Hubba, gives us a representation of a statue which is only a more highly finished example of that found at Zergul or Tel-Ho, which was made some 2,000 years before. But this style adopted by the schools of Chaldea, spread to the West, and we see similar modes of representation,—similar conventional attitudes in vogue among the Hittite sculptors at Carchemish and at Eynk, and later examples on the Lycian tomb of Harpagus, and in the seated figures from the Sacred Way at Barchide in Caria. The diorite figure in high relief, and in which an advantage has been taken of the natural configuration of the stone, closely resembles the figure of a Hittite priest of the Asiatic goddess found at Carchemish. In this example of early art the surface of a round columnar boulder has been hastily prepared for the reception of the sculpture. We have already pointed out in our notices of early Syrian and Hittite art that the influence of Babylonia was far more strong in the earlier examples of Boghaz Keui and Eynk, and in the Hittite gems than that of Assyria. Though our knowledge of these works was then only deduced from a few very mutilated examples, the conclusions arrived at are now fully maintained by the rich find at Tel-Ho. The discovery of the bronze figures and implements in this ancient city show that at a very early period metallurgy was in an advanced state among the people soon after their settlement in the country. M. Lenormant brings much philological learning to bear to show that,

prior to the separation of the primitive Akkadians from the other members of the great Ugro-Finnic and Tartar tribes, the northern branch, the Finn and cognate tribes, used a similar word for iron to that which appears in the Akkadian, or Old Babylonian, for copper; we have a similar transition here, then, as between Sanscrit and Latin, where, in the former, iron was *ayas*, which, in the latter, became *æs*, bronze. These facts show that, as one branch were natives of an iron-producing, so the others were natives of a copper-producing country, and the name applied by each was that of the word for "metal." The ancient city of Zergul was the chief centre of Chaldean fire-worship, and as such it became the principal place of the metal-workers. It is only necessary to glance at some of the hymns of the Chaldean Veda to see how intimately the connexion of the fire-god with metallurgy was observed and made a point of worship. Such phrases as "Fire, with thy pure and brilliant flame, thou mixest copper and tin, thou purifiest gold and silver," while in another text mention is made of pure molten bronze "in the crucible." The discovery of these works in copper and bronze in the ruins of the temple serve to show that at a very early period in Chaldean history the working of metals had reached a considerably advanced stage. Mr. Gladstone, writing of the state of art in Greece in Homeric times, says of the Greeks, "they used articles of bronze, but we never hear of tin as a commodity among them. They fused metals in moulds, but there is no trace of their mixing metals together." The gold-worker was a gold-beater, and in this work he was but a copper-smith to whom Nestor had given gold to plate the horns of a sacred bull. Yet with his anvil, hammer, and pincers he does this work. The fusion of copper and tin was known and practised by the Chaldeans, and on one of the figures in the British Museum there are traces of a finely-graven pattern which has been filled in with gold. The Jewish traditions make the ancestor of metal-workers Tubal-Cain, a dweller in this region, where now we find the earliest traces of Chaldean art.

These brilliant and important discoveries made by M. de Sarzec only tend to show how much there is yet to be recovered; how, in the low marshy region of the *Afadj*, there lie buried or sunk in the morasses valuable records of the earliest chapters of the world's history. These discoveries, taken in connexion with the astonishing find of inscribed records in the Temple of the Sun-god at Sippra, the ruins of which have been found by Mr. Rassam, buried beneath the mounds of Abbo Hubba, are all the more valuable. The ancient records all state that Assyria was but a child of Babylonia, and it is the discovery of such remarkable works of art as these, or of such a mass of literature as the 10,000 tablets unearthed by Mr. Rassam from the library of the Temple of Sippra, that brings to us solid proof of the greatness and learning, skill and wisdom, of the ancient Chaldeans.

It is to be hoped that now that Babylonia, the war-swept country, has still been proved to have buried beneath her many grave-mounds such valuable records and monuments, a new and strong effort will be made on the part of all students of history and archaeology to extend as wide as possible, and in a thoroughly systematic way, the work of exploration in this ancient cradle-land of the human race. Were the work carried out in a manner worthy of the great cause of the recovery of the past, we feel sure that the greatest possible benefits would be gained by all branches of research, and many lost chapters and paragraphs of the world's history would be restored to us.

**The Alterations at the Manchester Cathedral.**—Under the directions of Mr. Crowther, the architect, the work of the restoration of the pillars of the Manchester Cathedral is rapidly proceeding, and the first arch, just in front of the north door, is finished. Now that the thick coating of plaster has been removed the beautiful original lines of the pillar are brought to view, and some idea may now be gained of the light and graceful aspect that will be presented by the arches when the whole work is complete. The stones which were loose and crumbling have been removed, and others substituted, so that not only will the interior of the cathedral be made more beautiful, but the supports of the roof will be rendered much safer.—*Manchester Courier.*

## REMARKS AS TO THE VENTILATION OF THE CHANNEL TUNNEL.

TRUTH STRANGER THAN FICTION.

THE accounts which have of late been so freely sent to the daily newspapers of the visits paid by Royal and otherwise distinguished people to the works in progress with reference to the Channel Tunnel, have been generally silent as to those elements of the case on which alone any judicious opinion of the prospects of the undertaking can be founded. The progress of the seaward driftway, as the public are aware, has now been, at all events for the time, arrested, by the interference of the Administration, on reaching low-water mark, beyond which limit the Government claims the ownership of the bed of the Channel, at least on the English shore. Pending this enforced idleness, some of the promoters of the undertaking have paid a visit to the trial-shaft at Sangatte, on the French shore. In the brief account of their visit one or two points are mentioned, the full significance of which will escape public attention without a word or two from some expert in railway construction.

The depth of the shaft at Sangatte is stated at 280 ft.,—the driftway, now advanced 300 yards from the shaft, being 10 ft. in height. We may here note that, on the English side, from the best information we can collect (for the application on the part of independent professional men to be allowed to see the works has been refused), the depth of the shaft is 140 ft., and the inclination at which the driftway falls towards the centre of the Channel is 1 in 50,—a depth of 170 ft. having been thus attained before the stoppage of the work.

The only hesitation which we have in speaking as to these depths, assuming them to be correctly given, is due to the fact that they are not referred to a definite datum level, such as high-water line. Still, taking the last-mentioned depth on the French coast as below that datum, and supposing the driftway to be run (as is usually the case) along what is intended to be the crown of the tunnel, the rails at this point will be nearly 295 feet below the top of the shaft. For the railway to rise to that level, at a gradient of 1 in 50, will require a distance of 4.47 miles. In that distance, however, according to the best information accessible to us at the moment, the level of the country will have risen by at least 25 ft. to 30 ft., requiring a further distance of half a mile before the railway comes to the surface. On the English shore, again, on the above date, it will require a distance of 2.65 miles for the incline of the rails to reach a level of 20 ft. above high water.

But when these distances are added to the 21 miles from shore to shore, they come to a length of 23½ miles for the tunnel. We will not insist on accuracy to a few feet, for the before-given reason that the references of the levels are not made to any recognised datum. But, as far as the public is in possession of information, 23 miles will be the minimum length of the tunnel; and even that length is only obtained, as a minimum, by the introduction of a gradient such as is usually regarded as highly objectionable on locomotive lines.

We have seen no statement of the minimum length at which it was proposed that the tunnel should be made. But we have here, on data which can only have been furnished by the promoters of the undertaking, a state of things which is very serious. For ventilation, which in itself is a very important consideration, we will only regard the distance from shore to shore, as large shafts are practicable as soon as the land is reached. But for first the construction, and then the working, of a tunnel twenty-eight miles long, what estimates have been prepared? It is surely high time that the public should be told something on this score.

A hundred thousand pounds, we were told by Sir E. Watkin at a recent meeting of the Submarine Railway Company, have been raised for the experiments now, or lately, in progress. We do not address the gentlemen who found that sum. They had their own information, and their own motives; and we do not feel entitled to put any questions to them as to either. But Sir E. Watkin further told the meeting that his proposal was to make one mile of tunnel complete, and then to call upon the Government to make ten or eleven miles more. As to this, we have a good deal to say. It is a proposal that comes home to every taxpayer, and we say that no man, or body of men, is justified in making such a demand, if even they can be held



to be justified in making a large outlay which will be fruitless unless such a demand is accorded, without in the first place making a plain statement of what they wish to do, and of what they consider to be the debtor and creditor account of this scheme when carried into effect.

Speaking now simply on the information accessible to the general public, we must say that the idea of a tunnel of twenty-eight miles long is a new one to us. The length is entirely without precedent. That of the Mont Cenis tunnel is 7-6016 miles; that of the San Gothard tunnel is 10-0688 miles. The questions of the working and of the ventilating of such a tunnel as that proposed beneath the Channel are of the gravest description. The public are not educated judges as to the details of such operations. All the more necessary is it that such clear, intelligible, masterly statements should be put before them as shall convince them that no doubt is entertained by competent and disinterested judges who have fully discussed the matter. Then, again, as to traffic. How many persons who have their choice of a trip across the Channel in the *Calais-Douvres*,—to say nothing of the yet more powerful boats that are in course of construction,—as compared with twenty-eight miles of a railway journey, of which their only anticipations can be obtained from the experience of the Metropolitan Railway, would choose the latter? Nay, more than that, if they did prefer the latter, what will be the actual capacity of a tunnel of that enormous length for the conveyance of traffic?

On these points we shall have, it may be, something to say. We will now only say this much, that the addition of each mile to the length of a tunnel constitutes not only a positive, but also a negative evil. Not only does it increase capital outlay, and increase working cost, per unit of traffic and of distance, but it diminishes earning capacity, and that in a very serious ratio. As to this, however, it is for the advocates of the line to speak first. The estimates which the public require are those of the intending makers of the line. We may be in error and behind-hand with the rest of the world; but we have kept our attention fixed on the subject from the moment of its first suggestion, and as yet we have seen no estimate, either of length, of cost, or of traffic.

Let us look for a moment at the question of the ventilation of the tunnel. It is one as to which the architect is pretty nearly as much at home as the engineer. We leave out of notice what may be called projects of "fancy ventilation," that is to say, of forming a special conduit for the products of combustion at the top of the tunnel, with the view of diminishing the exhaustion required. We do this for two reasons. First, we hold that any plan for the exhaustion of which the public are asked to find millions ought to be based on practical experience, and not upon theory; and secondly, considering the relative gravity of carbonic acid gas and common air, we are not of opinion that an exhaustion that would keep the tunnel pure could be readily effected by the suggested "separate system." Taking it, therefore, as the ground of inquiry, that such a ventilation must be maintained through the whole tunnel as shall prevent the atmosphere from being charged with more than a treble dose of carbonic acid,—that is to say, with 15 volumes of carbonic acid in 10,000 volumes of air,—let us turn to those rules and formulae for ventilating tunnels which are to be found in the best authority on the subject, the third edition of Mr. Simm's standard work on "Practical Tunnelling."

Neglecting the subterranean ends of the tunnel, and taking the length only as 111,000 ft., or 21 miles, in round figures, and allowing fifteen trains each way, or thirty in all to pass during the twenty-four hours, the engine-power required to effect ventilation, according to the formulae on page 342 of the work cited, will be more than 2,000-h.p. (2,187-h.p.). Allowing the very moderate proportion of 7 tons of coal per horse-power per annum (taking 330 days of twenty-four hours each), we have a quantity of upwards of 15,000 tons of coal per annum required for this purpose. At 11. per ton this comes to 7251. per mile of tunnel per annum for fuel alone. Then we have to add for labour, and for interest, maintenance, and replacement of machinery. Let us take these as low as possible, and we still come to the fact that the ventilation of the tunnel alone (according to the accepted rules), will cost more than the entire cost of working of the Scottish railways, taken mile for mile.

But the problem is by no means so simple as to be set at rest by a formula. The cost above given provides for the maintenance of a current of a little less than eight miles per hour through the tunnel, that being the rate required to keep down the proportion of carbonic acid to 15 in 10,000 volumes. But the wind very often attains three or four times this velocity. Assuming that, on the ground of the usual prevalence of westerly winds, the ventilating apparatus is erected at Sangatte, what will happen when a violent east wind arises? It would seem to be indispensable that there should be an apparatus at each end, to be worked according to the set of the wind. But here is a double expense in everything except fuel.

Again, we have kept down our estimate of the length to be ventilated to the submarine portion of the tunnel alone, because "the rapid increase of power," Mr. D. K. Clark tells us (in the work we have cited, page 343) "necessary for artificial ventilation, in proportion to the length of the tunnel, is very remarkable. The increase, in fact, takes place in the ratio of the fourth power of the length, so that a tunnel twenty miles long requires 10,000 times the power for ventilation required for a tunnel two miles in length." This is not a mere theory got up in order to oppose any particular scheme. It is the statement of a standard work, which is the latest authority on the subject in the English language. It is proper that the public should be made aware of the plans suggested for this end. The case is complicated by the presence of the ends of the tunnel. To make the ventilating apparatus effective at the shaft, the comparatively short length from that shaft to the outer air must be in some way closed, otherwise the exhaustive power would be at once reduced by half, and, indeed, by much more than half, as the friction through the two or three miles of the tunnel end would be so much less than that through the 21 miles of tunnel, that there is great question whether the body of air filling this latter space could be set in motion at all by exhaustion at the shaft, if the shore end opened into the same shaft. Thus, the ventilation is not a mere matter of cost, it is a question of physical difficulty; and only one of those questions of that nature the importance of which increases in a very rapid ratio with the increase in the length of the tunnel.

These figures are so large, that we are careful to cite our authority for them very distinctly. They are worked out by the formula

$$H = \frac{V^3 PL}{27,000,000}; \text{ where } H \text{ is the total indicator}$$

horse-power required;  $V$  is the velocity of current in feet per second;  $P$  is the perimeter of the tunnel, in feet; and  $L$  is the length, in feet. And Mr. Clark's table states that for a tunnel twenty miles long, with four trains per hour both ways (two each way) the horse-power required for ventilation is 15,140 horse-power, or more than seven times what we have taken.

It may perhaps be urged that the need of so much ventilation will be obviated by the use of some as yet untried mode of propulsion for the trains through the tunnel, so that the escape of the products of combustion will be avoided. Far be it from us to deny the possibility of such improvements. But the first requisite for any business-like discussion of an engineering scheme is, that the outlay of money should be based, not on hope, but on experience. As far as we are yet acquainted with the progress either of the compressed air locomotive, or the electric method of propulsion, the length and gradients of the tunnel offer very serious difficulties. We do not say that they are insuperable. But we say that it does not become men of business to commence an undertaking without both counting the cost, and having practical experience of the mode in which it is to be completed.

We may add that every method, possible and impossible, of working and ventilating a long tunnel was discussed at great length, on January 18 and 25, 1876, at the Institution of Civil Engineers, and that Mr. D. K. Clark's additions to the third edition of "Practical Tunnelling," which we have quoted, are given as the outcome of that discussion.

The Spring Exhibition of Modern Water-Colour Drawings, Brighton, was opened to the public on Thursday, April the 20th.

#### SOME PRACTICAL NOTES ON BUILDING WOODS.

In a previous paper we commented at considerable length upon the unmeaning terms so frequently adopted by architects when defining in their specifications the sorts of timber which they require to be used in their buildings.\* That such meaningless terms have been commonly used has arisen, we feel certain, less through carelessness than through an insufficiency of knowledge. The real state of the case, perhaps, is that the timber trade is a trade concerning which architects possess really very little information. It is a trade that is not only extremely difficult to learn, but it is one that is continually undergoing marked alterations and changes. Timber itself is a material which affords infinite scope for all sorts of arguments concerning its durability, its strength, its relative cheapness, and its suitability for the thousand and one purposes to which it is every day being applied. The changes that occur in the forms of manufacture in which it is shipped to this country have been less the outcome of fashion than they have been endeavours made to meet the ever-altering requirements of those whose business it is to make use of it. It is well that, now-a-days, the saw-mill owners abroad, having, perhaps somewhat tardily, recognised the economy and pecuniary advantage of sawing up wood into shapes convenient for immediate use, are now quite willing to listen to advice and suggestions made to them on this side, because until quite recently they, by obtusely declining to adopt any suggestions made to them as to alterations in modes of manufacture, not only foisted on to our builders a number of inconvenient sizes, but to retain what may be termed "orthodoxy of size" they wasted yearly an immense amount of exceedingly valuable wood. What this waste has in the aggregate amounted to will, doubtless, never be accurately reckoned; but it has been sufficiently extensive to well warrant us in saying to them, with Pomona's bard,—

"Attend my lay, nor hence disdain to learn  
How nature's gifts may be improved by art."

Some of the faults of form of manufacture are retained to-day, and little hope of any immediate alteration can be entertained. A notable instance is that of mahogany.

Every user of mahogany knows perfectly well that the soundest, and the most highly figured, wood is nearly always to be found on the outside of the logs. By the system, therefore, which is in practice of squaring the logs, a great portion, and, in fact, the greatest portion, of the most valuable wood is wasted. Why such a ridiculous and wasteful form of manufacturing mahogany logs should be adhered to would appear to be incomprehensible, and, indeed, is only to be accounted for on the supposition that in a square form the logs are the most suitable for transit. Surely, however, an octagonal form would meet the difficulties of transit. By adopting such a plan of hewing the logs, if all the valuable portions of the wood were not preserved for use, yet a much greater quantity than is at present retained would be preserved.

The shippers abroad, and the foreign saw-mills, have, however, not been alone in matters relating to the waste of wood. Perhaps the greatest offenders have been the architects on this side. The losses which, through want of intelligent manufacture, shippers have caused have, for the greater part, been borne by themselves. The losses that architects are daily causing, either by their carelessness or by their lack of knowledge, fall entirely upon the builders. In no cases do these losses occur more flagrantly and frequently than in those where weight-carrying beams are specified to be of what we will term "unequal sizes." It is necessary to define in the first instance what we mean by "unequal sizes." All log timber is hewn, and all sawn pitch-pine timber is sawn into equal squares—i.e., if a log squares 12 in. on one side, it will square 12 in. on all its sides. It is the same in every case, whatever the size of the log may be. Of course, a long pitch-pine log may taper in its length very much, but at each end its sides will be equal. To ensure economy, therefore, such unequal sizes as 12 in. by 7 in., 14 in. by 9 in., 18 in. by 10 in., or 12 in. by 5 in., and 14 in. by 8 in., should never be specified, unless it be imperatively necessary that such "unequal sizes" should be specified. It is obviously more economical to specify 12 in. by 6 in., 14 in. by

\* See p. 412, ante.



7 in., and 18 in. by 9 in., as then it will at once be seen that by simply giving one deep cut to a log two "equal-sized" beams are secured. It may possibly occur to some architects that the piece or pieces cut out of a log may be of considerable service to the builder, who may use them up for joiner's work. This, however, albeit a popular supposition, is quite an erroneous one. The thick slabs cut off the outside of logs in the conversion of beams are all but useless, in most cases, in consequence of their surface manufacture as well as through being either too coarse or too sappy. The slabs which come off hewn logs that are required to have sawn sides are valueless, and are not therefore as a rule sent with the sawn logs, but are retained at the saw-mills at the timber ports, and there used as fuel. The advantage, therefore, that architects can confer upon builders by specifying their beams to be of "equal sizes," is very apparent. Architects should also take care never to specify their beams to be of longer length than is quite necessary (i.e. when the lengths exceed, say, 20 ft. to 25 ft.), because the price of log timber per foot or load is largely regulated by the cubical contents of each log; it advancing in proportion just as the cubical contents of each log increase.

The same remarks apply, of course, equally to the size of the beams as to the lengths. Pitch pine is the cheapest and the safest wood to specify for beams. By the safest we mean that, it being a wood of more uniform quality than the others, it is more likely to be secured free from sap, knots, and shakes. We do not refer to its relative strength, tenacity, or durability, which, of course, is another question altogether.

The main sizes in which sawn deals and boards are shipped to us are as follow, and we place them in a tabulated form for the more convenient reference of architects. They are:—

4 by 12 inches.	2 by 6 inches.
4 " 11 "	2 " 5 "
4 " 9 "	1 " 7 "
3 " 11 "	1 " 6 "
3 " 9 "	1 " 7 "
3 " 9 "	1 " 6 "
2 " 7 "	1 " 7 "
2 " 9 "	1 " 6 "
2 " 7 "	1 " 5 "

There are other sizes of sawn wood that are also fairly common, but they come forward in smaller quantities than do the sizes we have enumerated above, and, as a consequence, they are somewhat more difficult to meet with, although, as we shall presently point out, they are, because less frequently called for, sold at a cheaper rate. We do not, however, on this account advise architects to specify their use, because should special lengths be required the builder may have great difficulty in meeting with the lengths. What may be termed as the second category of sawn wood consists of the following sizes:—

4 by 8 in.	2 by 4 in.
4 " 7 "	2 " 3 "
3 " 12 " and up.	1 1/2 " 9 " and up.
3 " 10 "	1 " 8 "
3 " 8 "	1 " 6 1/2 "
2 1/2 " 9 "	1 " 5 1/2 "
2 1/2 " 8 "	1 " 4 1/2 "
2 1/2 " 6 1/2 "	1 " 4 "
2 1/2 " 6 "	1 " 3 1/2 "
2 1/2 " 5 1/2 "	1 " 3 "
2 1/2 " 5 "	1 " 2 1/2 "
2 " 8 "	1 " 2 1/2 "
2 " 6 1/2 "	1 " 2 1/2 "
2 " 6 "	1 " 2 1/2 "

Further than the above there are what in the timber trade are termed "off sizes," that architects need not, however, take cognisance of, inasmuch as they come forward only in very small quantities.

We are convinced that true economy will be attained by specifying the standard sizes that are enumerated in the first list, because by specifying those sizes builders will have the opportunity offered to them of the cheapness which is always to be found in the competition that a large stock to select from affords.

The question of economy as to building woods involves many considerations.

It has often, as a case in point, been discussed whether broad or narrow flooring-boards are the most economical at their respective prices. 1 in. by 7 in. may be taken to be one of the standard sizes of flooring-boards. As 7 in. is a well-known width, there is a great demand for it, and in consequence it is the most expensive width, although a narrower board costs more preparing per square or per standard. The usual difference in price between a 1 in.

by 7 in., and, say, a 1 in. by 5 in. flooring-board, ranges from 20s. to 25s. per standard, or 1s. to 1s. 3d. per square. Against this, the saving in the first cost of a 5 in. board, however, comes in, and the way losses, which do much towards lessening it, indeed, they do not fully reduce, the first apparent difference of cost. There is a loss of wood of from 1/4 in. to 3/4 in. upon each 7 in. board laid down to make a floor, and of course, there is precisely the same loss incurred in each 5 in. board. Thus, reckoning the loss at the lowest estimate of half an inch, there is a loss of a tenth incurred in using a 5 in. board as against a loss of only a fourteenth in using a 7 in. board. As a matter of fact, the English planing-mills nearly always take off at least five-eighths of an inch when tonguing and grooving flooring-boards. In planing American spruce boards, which are rarely parallel, this may be a necessity, but it is not a necessity, as a rule; and, as a piece of advice to builders, we would suggest that, when ordering their flooring-boards, they demand that not more than half an inch of wood shall be wasted in the tonguing and grooving, which, indeed, should be abundantly sufficient. The loss of wood, however, incurred in using narrow in place of broader boards is not the only expense necessitated. It takes just the same number of nails to fasten down a 5 in. board as are required to fasten down a 7 in. board, and so the cost of the extra nails required for the 5 in. boards represents an additional cost in that particular, and seven required for the broader, as against five only wanted for the narrower size. Then, of course, the labour of driving home the nails must be divided in the same proportion.

Doubtless, a 5 in. board is somewhat lighter to handle than is a 7 in. board, but practical men tell us that it takes really the same length of time to lay a 5 in. as it does a 7 in. board. Whether this is exactly the fact may be doubted, but, at any rate, the difference does not appear to be appreciable. It is quite certain, however, that a floor made of 7 in. boards can be laid down in much less time than can one made of 5 in. boards. Thus to rank as against the saving in the reckoned price of 20s. to 25s. per standard, or 1s. to 1s. 3d. per square, in the using of 5 in. boards, there is, firstly, the loss of wasted wood by the increased number of joints; secondly, the cost of the extra nails, necessitated by the increased number of boards required to cover the same space; thirdly, the extra labour necessitated by the handling of the greater number of boards, and the driving home of more nails. Further than this there is the finishing off of a larger number of joints. On the whole, it may be taken that the saving of 20s. to 25s. per standard, or 1s. to 1s. 3d. per square, does not cover the loss, and also pay for the extra labour which the narrow boards necessitate. It would seem that a margin in price of something like 40s. per standard, or 2s. per square, would be required for the purpose. Of course, the narrow board supplies a better floor, but we have been considering the question of cheapness only, which is often the main consideration.

Four-inch deals are more costly than are 3 in. deals, because there are fewer of them to be got. It will be readily enough understood that it requires larger and better trees to cut 4 in. deals from than are required for the making of 3 in. deals, and thus the larger deals are less plentiful. Descending the scale, we find by the same rule that 3 in. by 11 in. and 3 in. by 9 in. deals are more costly than are 3 in. by 7 in. and 2 1/2 in. by 7 in. battens.

The difference in value between deals and battens of carpentry-quality ranges usually from 15s. to 20s. per standard, or from 10 per cent. to 15 per cent. The term "deals" is applied to any sawn wood that is 3 in. or 4 in. in thickness and more than 7 in. in width. The term "battens" is applied to any sawn wood that is 2 1/2 in. and not more than 3 in. in thickness, and that is 7 in. and under in width.

Sawn wood that is less in thickness than 2 1/2 in. is termed "board." Small stuff of square or nearly square sizes is termed "scantlings." "Timber" is a term applied only to logs.

It is worth while for architects to give their passing attention to these remarks, as the terms "timber," "deals," "battens," "boards," and "scantlings" are frequently more or less misapplied by them.

A correction of definition on the part of architects when specifying the materials they require to be used is likely to give to the builder confidence in their ability and general knowledge, and so they will be likely to take fewer liberties with them.

Inasmuch, as we have pointed out, that battens range in price from 10 per cent. to 15 per cent. less than deals, it is obvious that economy is insured by architects specifying their spars and other "scantling" sizes to be of such dimensions as can be symmetrically cut out of battens, instead of, as they are usually specified, such sizes as can only be got out of deals.

A saving of 10 to 15 per cent. in any one item is no little matter.

Economy in building, it will be admitted, is to be made up only by the savings extracted out of a number of items. It is not possible to largely reduce the cost of any particular material without too injuriously affecting its worth. Intelligent economies, however, may be practised in a thousand and one cases, and it is to the minute economies that are to be attained in the intelligently using of wood that these papers hope to usefully direct attention.

Allied with this desire is the wish to convey to architects a better knowledge of the building woods of commerce generally. With the ever-varying conditions of the wood markets, architects have little or nothing to do. They have, indeed, not sufficient time to bestow in that direction. It is to be expected of them, however, that they shall make themselves acquainted with some of the everyday terms of the trade, so that when using those terms as definitions they shall employ them in their proper and understood sense. In our next paper we shall give tables and rules for basing calculations upon that will be of material assistance alike to architects, builders, and others who desire to estimate the cost of the woodwork of buildings. In addition to these tables and rules, we shall give a number of notes relating to wood and wooden articles used in building that have been compiled during a long experience of the trade.

#### THE DELTA OF THE NILE.

The society we have already noticed in these columns as formed for the purpose of exploring the Delta of the Nile, amply shows, by the names of those who have given the project their approbation, the wide-spread sympathy that is entertained for the scheme.\* To Biblical students the interest attached to the land of Goshen, which it will be one of the first duties of the new society to explore, it is needless to dwell upon; while to Egyptologists the promise of discovery held out is perhaps even greater. The interest we feel in Egypt is one that from our earliest childhood is fostered by our Biblical studies; long before the history of our own country has assumed for us any definite existence, the whole story of the Egyptian sufferings of the Jews and their deliverer Moses is familiar to us in almost every detail. But though this for generations has been the case in all Christian, even Israelitish, countries, it has been left, by a curious series of circumstances, to our century to explore the land of the Pharaohs and its wonderful monuments. Biblical history has assumed a new aspect from the light thrown on its incidents by the discoveries in recent years in the land of the Nile and the neighbouring Assyria and Palestine. A fresh departure is now to be taken in the projected exploration of the Delta and the land of Goshen, the scene of the sufferings of the descendants of Joseph's brethren, the Israelites whom Moses, from this very spot, led forth from captivity and cruel bondage to the Promised Land.

The labours of the new society will not, however, be limited to the exploration of the land of Goshen, though its work will be strictly confined to the district of the Delta of the Nile, "the Delta" *par excellence*, the triangular slip of land which lies between the two principal branches,—the Rosetta branch and the Damietta branch,—into which the Nile at its mouth divides to flow into the Mediterranean. It was

\* The outline of operations, as now prepared, has received the approval of the Archbishop of Canterbury, the Bishops of Bath and Wells, Durham, and Lincoln, the Chief Rabbi, Archdeacon Anson, Mr. Robert Browning, the Earl of Carnarvon, P.S.A., Canon Cook, the Dean of Manchester, Miss Amelia B. Edwards, Mr. A. W. Franks, V.P.S.A., Professor Gardner, Hon. and Rev. E. Carr-Glyn, Miss J. B. Harrison, Mr. B. V. Head, Professor Huxley, F.R.S., Mr. Constantine Loides, Mr. Stanley Lane Coole, the Right Hon. Sir A. H. Lydard, G.C.B., Professor Logan, Sir John Lubbock, M.P., Sir Theodore Martin, K.C.B., Professor Max Müller, Mr. A. S. Murray, Mr. John Murray, Mr. E. Naville, Professor Newton, C.B., Professor Owen, C.B., Mr. B. A. Proctor, Mr. Reginald Stuart Poole, Professor Sayce, Hon. J. Villiers Stuart, M.P., Mr. W. Spottiswoode, F.R.S., Mr. Torrian de la Conquerie, Rev. G. H. Tomkins, and Sir Erasmus Wilson, L.L.D., F.R.S.



from this, its triangular shape, resembling the Δ of the Greek alphabet, that the Delta obtained its name, one now given geographically to the mouth of any river which may be divided into several branches. Originally the Nile flowed into the Mediterranean by seven distinct channels,—

"Et reptemgemini turbant trepida ostia Nilii."  
VIRGIL, "Æneid," vi. 809.

Traces of these seven channels still remain, but the neglect of centuries has long since choked their courses, and the river which once fertilised a huge area now rolls its chief bulk along two branches which form the upright sides of the Delta triangle. Nothing but the ruins which mark the sites of former cities and a few artificial mounds raised for purposes of protection against the annual inundations of the Nile, break the vast flat plain of the Delta. In parts the district is extremely fertile, and the few populous towns naturally cluster in this portion of the province, which within a few years past has been supplied with a railway running between Cairo, Alexandria, and Damietta.

Comparatively speaking, the Delta remains unexplored, the ruins of cities once famous and thickly populated lie untouched, their sites in most cases satisfactorily identified, only awaiting the vivifying research of the archaeologist. Nearly half a century ago Sir Gardner Wilkinson expressed warmly his regret that "this part of the country" should have been "so little examined, especially as some light might possibly be thrown on the remains of 'this part of interesting period.'" Though the late Mariette Bey did some years since conduct a series of excavations in portions of the Delta, at Tanis or Zoan, and elsewhere, it has, it may be said, been left to our generation to systematically commence the exploration of a district of Egypt which is known to contain the most interesting archaeological and historical remains.

The information to be gathered respecting the Delta is not very abundant, a fact arising from the very neglect which the new society proposes to remedy. The interest connected with Egypt has centred of late years more on Central and Upper Egypt, where so many marvels have been unearthed. Some facts, however, relating to the Delta are obtainable, chiefly from foreign sources. It may serve to show how small has been the attention paid to this interesting district that perhaps the fullest account of its ruins is to be gathered from the series of volumes,—well known to all Egyptologists,—published early in this century, and bearing the general title of "Description de l'Égypte," chiefly formed of reports and papers made in Egypt during and after the famous French expedition under Napoleon, in which Nelson so distinguished himself. On this score alone the Delta is endeared to every Englishman from the remembrance of our naval hero's celebrated exploits at Aboukir. Further information respecting the Delta is to be obtained, of course, from the stock Egyptian sources of reference, among which should not be neglected Sir Gardner Wilkinson's "Topography of Thebes, and General View of Egypt," published now hard on half a century since (London, 1835), but re-formed into Murray's excellent Handbook, of which a new edition was published in 1880. The volume on Egypt by the distinguished German archaeologist, Georg Ebers (*Ägypten in Bild und Wort*), only completed last year, will also be found to supply much interesting information, placed within the reach of English students by the translation by Clara Bell, published by Cassell. A French translation, from the authoritative pen of M. Maspero, was one of the artistic publications of the last Paris season.

From these sources we are able to gather a sufficiency of information to enable us to form some idea respecting the scene of the proposed labours of the new Delta Exploration Society. The mounds of ruins that are scattered over the vast district have in most cases been recognised; they alone await excavation. Doubts, of course, exist regarding many points; while unlooked-for discoveries cannot fail to be made. The respective sites of Sais, of Tanis, of Busris, of Sebennytus, and several other of the great cities of the past, have been determined beyond dispute, and many interesting discoveries await the excavators in these quarters; but it is chiefly in the ruins so far left undisturbed that the greatest hopes are centred. Who can foresee what may be brought to light, or what extraordinary "find" may not be made? The so-called "land of Goshen" cannot fail to yield the most in-

teresting relics of the distant time when the Israelites were in bondage.

At present, however, as we have above remarked, our stock of positive information is but scant. We know from Greek and other authorities that the Delta, till comparatively recent times, was thickly inhabited; its cities wealthy and famous; ruins and a few mud-huts only now mark, in most cases, the site of their once-thriving centres of population.

Sais, which it is almost at once proposed to explore, was, among the cities of the Delta, one of the most important. In the modern Arab village of Sâ el Hagar,—Sâ, the remains of the original name, El Hagar, given it in consequence of the stones that surround the town,—there is every evidence that it occupies the site of the great city of which Strabo has left us such a detailed description. The ruins lie within a vast inclosure nearly 1,000 yards long by about 800 yards broad. This is all that marks the site of the once brilliant residence of the Pharaohs, the learned city in which flourished the famous school scarcely less celebrated in Greece than in Egypt, to which Herodotus specially travelled, where Solon learned of that mystic Atlantis far out in the west with which Plato has puzzled till this day the learned and the inquiring. It was from Sais, too, tradition asserts that started, under the guidance of Crotopus, the colony that was to found Athens; on this score alone, an interest is attached to these ruins which few cities in the world can rival. Readers of German current literature will doubtless recall Herr Ebers's historical romance of "The Daughter of Pharaoh," in which the eminent Egyptologist endeavoured to picture in the days of its building the once wealthy city of Sais,\* but of its past nothing now remains but a terrible ruin; when, some years ago, Mariette Bey attempted a series of excavations his task, he found, was almost hopeless. Of all the marvels described with such detail by Herodotus and Strabo, scarcely a vestige, on this preliminary examination, could be found. The text of Strabo is so precise as to fix to a certainty the site of Sais. Herodotus, without stating its position, gives us, however, a lengthy account of the city at the time of his visit (Book ii. of his History).† He describes the superb royal palace, and the temple of Minerva, one of the most magnificent in Egypt, and in which was the tomb of Oeiris. It was to Amasis, during his long and prosperous reign (about 570 B.C.) that the temple, dedicated to the goddess Neith, owed its chief architectural glory. The portico surpassed in size all similar works in existence; Herodotus speaks of a colossus, 75 ft. high. The huge stones used by Amasis came in part from the quarries of Memphis, in part from those of Syene; obelisks rose before the temple, near which lay the huge circular basin or holy pool on which were celebrated at night the mysteries of the deities, Isis and Oeiris. The interior of the temple was scarcely less magnificent, but its chief marvel was the monolith chapel. In the removal from the quarries of Elephantis of this enormous block of stone, the weight of which we may calculate from the measures given at some 500 tons or more, 2,000 boatmen were employed during three years. But of all these marvels and many more, the late Mariette Bey during his excavations discovered only unrecognisable ruins; further and more systematic research might, however, reveal something of all this past grandeur in spite of the fact that the ruins have been used as a quarry to build up Alexandria and other more modern cities.

Naucratis (another of the cities to be explored), from the text of Strabo, we conjecture lay not far north of Sais (Book xvii.). It is described by the classic geographer as lying on the left bank, ascending the Nile, and is mentioned by him just before Sais. The modern village of Desouk seems to answer to this description, though MM. Du Bois Aymé and Jollois, in their stay on the Delta at the close of the last century ("Description de l'Égypte," vol. v.), in describing Sais, state that though the position of Naucratis seemed well defined, they found no traces of any ruins that could be taken as answering to the site of the once flourishing Greek city,—a fact, however, at which they expressed no astonishment, recalling as they did

how very different and far less substantial was the mode of Greek building. The respective positions of Sais and of Naucratis given by Ptolemy coincide with that given by Strabo. The modern belief, as supported by Ebers, is that the existing village of Desouk probably occupies the site of Naucratis, a city which we know was the precursor of Alexandria, the only city in Egypt in which the Greeks were permitted to settle and to carry on their trade. The city was, in fact, a thorough Greek colony, which led an ultra Greek life, being famous in antiquity for its flowers and its beautiful women.\*

Besides Sais, the Delta contained many important cities, the sites of which are now only marked by ruins. Not far from Sais, but further south, lie the mounds which cover the ancient city of Sebennytus, the modern Semmenoud, at present a comparatively active commercial centre. Near to Semmenoud lie other ruins which the archaeologists have recognised. To the north stretch a series of mounds near the village of Bahbeyt. The heaps are of a quadrangular form, some 80 yards long and about 20 yards high; the material is of crude or unbaked bricks, forming a large enclosure, within which is scattered a confused mass of ruins, architectural details, and bas-reliefs, chiefly of granite from the distant quarries of Syene. To this fact MM. Du Bois Aymé and Jollois have drawn especial attention, as showing the extreme care taken by the Egyptian builders in the past to ensure the stability of their work. They were fully aware that only granite would be able to resist the effect of the sea air; no difficulties seemed capable of daunting these marvellous builders, and only the hand of nature,—some terrible earthquake,—can have overthrown these ruins, the interest of which, from all accounts, would seem very great. The same competent authorities we have above mentioned, who devoted some attention to these ruins, speak of meeting here with no instance of monolithic columns of Egyptian origin. They seem all to have been built up in drums. The monolith column was a foreign importation, as we see in the so-called Pompey's Pillar at Alexandria.

Among the other important ruins of the Delta, so far recognised, may be mentioned those of the ancient city of Babastis, the modern Tel-Basteh, and referred to in Scripture, in Ezekiel. The prophet's dire prediction did, indeed, come to pass, and by the vitrification of some of the existing stones it is evident that the city was destroyed by fire. Nothing remains of the temple, the elegance of which Herodotus praises as surpassing that of any building in the world. Ebers found here (see his "Ägypten") some years since, two images of the cat-headed goddess, the celebration of whose mysteries Herodotus speaks of in detail. To Babastis were sent all the embalmed cats of Egypt.

At Menoof the modern city is built on the remains of an older city, the antiquity of which is known to be very great. MM. Du Bois Aymé and Jollois suggest this as the site of the classic Nicii. Near Menoof, at Chybyn-el-Koum, the same authorities speak of a mass of débris which they believed to mark the site of the city of Atarbachis, referred to by Herodotus, and by Strabo as Aphroditopolis. Near Melys also are noticed as existing a series of important mounds of crude bricks, perhaps the remains of the city of Byblus. At Bousir other ruins are noticed by travellers as surrounding the village, the modern name of which would point to this being the site of the city of Busris, in which, according to Herodotus, there existed a large temple consecrated to Isis.

Among the ruined cities of the Delta, mention of Tanis, the modern Sîn, the Zoan of Scripture, should not be overlooked. It lies near the shores of Lake Menzaleh, on the eastern side of the Delta. To Tanis more than usual interest is attached; its antiquity is great. Its position in Scripture is familiar to every Biblical student. At the present day the ruins for miles round are the most conspicuous feature on the flat plain. The space of ground they occupy is remarkable, some 200 acres or so, but scarcely one stone has been left on another to tell the tale of the grandeur of a city that was antique even in the days of Moses. We may look upon Tanis as indeed the scene of much of the misery of the Israelites when they were in bondage; the huge enclosure

\* There exists, it may be mentioned, an English translation of this novel, published among the German authors of the Taschenbuch collection. The English version is entitled "An Egyptian Princess."

† Herodotus, the oldest of the Greek historians, the "Father of History," was born in the authority of Lemprière, 484 B.C. Strabo, it must be remembered, wrote about 400 years after Herodotus.

\* Ebers states that the city was probably more towards the west than Desouk, "but where, it is difficult to decide." (See p. 83, Maspero's translation, "L'Égypte," 1881.) It is worthy of mention that MM. Du Bois Aymé and Jollois were told, at Desouk, of "ruins lying at Koum Fura'oum."



wall was in all probability one of the forced labours of the unfortunate bondsmen; the unbacked bricks are the same as described in Scripture, bound together with chopped straw. We are here, in fact, in the land of Goshen, and we may look on Tanis as the scene of Moses's early efforts to free his captive countrymen. The capital from which the provinces allotted to the race of Joseph took its name of Goshen was called Pa-ot, Pha-kos, and was known to the Greeks as Gosen; near the modern village of Fakous lies a series of mounds covering ruins, among which Ebers found the name of the great Pharaoh, the oppressor of the Israelites. To return, however, to Tanis. Ebers speaks of the extraordinary appearance of the ruins. "Many cities and temples have left more considerable remains, and in better condition, but none, surely, are more picturesque." It is only at Thebes that so many monuments built in granite could be found; but none are in such condition as to allow of a plan being made. The huge sanctuary erected by Rameses II., the great Pharaoh of Scripture (about 1400 or so B.C.), has sunk in.\* Each epoch of Egyptian history, except the oldest, has, we are assured by Ebers, left its trace in Tanis. The fall of the great city, now situated in a deserted plain, is only comparatively recent. Ptolemy, Pliny, and Strabo all speak of it. After the establishment of the Christian religion it was the seat of a bishopric, and the sea was occupied till the eleventh century; its name is last connected with history in the story of the Crasades. From that time we hear nothing more of Tanis. The sea was allowed to creep over the fertile plain, and form the existing lake Menzaleh, which it has been said by the engineers could, with the modern means at our disposal, be again dried. Perhaps the newly-constituted Société des Etudes du Nil will take up the question. On the site of Tanis itself excavations have been made; but the greater part of the ruins still remain buried in the sand, jealously guarded from any foreign research. Perhaps, as Ebers has suggested, the Government have not yet recovered from the annoyance they suffered at the fortunate discovery made, not so long since, by Lepsius, who, poking about in the sand, laid bare a monument now in the Boulak Museum, and well known to Egyptologists as the Stone of Tanis, or the Decree of Canopa. It is sincerely to be trusted that the society formed for the exploration of the Delta may meet with many similar pieces of good fortune. The task they have before them is no light one, but they may set to work with the inspiring reflection that the interest and good wishes not only of their country, but of both hemispheres, will follow them in their arduous labours.

#### THE INSTITUTE OF PAINTERS IN WATER COLOURS.

THE present exhibition is, we believe, the last which the Institute will hold in the rooms they have so long occupied in Pall-mall; after this year their exhibitions will be continued, it is understood, in the new premises in Piccadilly. Some of the leading members are very well represented in this exhibition, the forty-eighth of the annual spring exhibitions of the Institute. Mr. J. D. Linton sends but one work, a single figure, "The Lute" (58); but this, though in one sense not so interesting as some of his highly dramatic scenes in which several figures are introduced, is, nevertheless, in his finest style. It is a three-quarter length of a lady in a dress of warm-toned and rather subdued yellow, approaching orange, with an ample crimson sash round her waist, holding a lute, on which she is playing. The face, very finely painted, is sad and subdued in expression. It is one of those figures which are not the less interesting and suggestive because, in regard to its intention, much is left to the imagination of the spectator. In rich harmony of colour, it is one of Mr. Linton's finest productions. Among other figure pictures, which are not so numerous as this class of subject generally is in the Institute Gallery, Mr. Towneley Green contributes two, of which No. 167, "The Autocrat of the Breakfast-table" (a small child to wit), though showing the artist's usual excellence of execution, is not of much interest in subject; but the other, "Old

Prints" (11), is beautiful. It is an interior, with a single figure, a lady, looking over some prints from a portfolio. It has the merit of complete realism without a touch of hardness. The sleeping dog, the quaint Queen Anne fireplace, the screen, and other details are all perfectly given, and blend into one rich but subdued harmony of tone. Mr. O. Green's "Summer Goods" (22), a shop scene in the days when young ladies hid their faces at the back of a long funnel called a bonnet, is also very clever realism, but a trifle hard and sharp, not toned into the pictorial beauty and completeness of the last-named work. Mr. Percy Macquid's "Iconoclasts" (131), is a charming little work, although very slight in subject: an interior with two figures, children, of whom the boy, we regret to say, is firing pistol-shots through an old stained-glass window. Such clever execution, and such admirable effect of light, might well have been bestowed on the elucidation of some more interesting subject. Mr. Henry Stook's "Aspiration of a Soul while listening to Music" (184), is an ambitious and not quite successful attempt. The "soul" of the man who is listening is too heavy and solid-looking an angelic figure to compel our belief in its spiritual essence; it seems rather like a third visitant in the room. This is a kind of attempt which, we imagine, must depend for its success very much on the mood of the spectator. It is too much like the attempt to paint a thought in visible form; but there is fine colour and feeling in the drawing. Mrs. Elizabeth Murray's "Boys' School in Algeria" (78), and Mr. C. Green's "A Talented Troupe" (65), are both clever pieces of humour, in very different styles; and Mr. R. Caldecott sends a very interesting and unusual sketch of a scene at Florence,—"The Brotherhood of the 'Misericordia' taking a Patient to the Hospital" (39)—unusual both in its tones and in the curious character and dress of the actors in the scene.

Among landscapes, Mr. Keely Halswelle has achieved a marked success in "The River below Sonning" (75), a landscape with heavy overhanging clouds, and the quiet Thames in the foreground, in which breadth and delicacy of execution are most happily combined. This is not disfigured by the sombre and rather "dirty" tones which have characterised the painter's larger landscapes in the Academy for the last two or three years, but is bright and fine in colour. Mr. Orrook's "In Charnwood Forest" (72) is a very fine and boldly-handled study of a foreground of trees with a long stretch of country beyond; the varying tones of the foliage have been very carefully studied. There is a little too much leaning to roughness of execution in such drawings as Mr. Collier's "Under the Crag" (157), and Mr. Mac Whirter's "Lake of Menteth" (152); in the latter there is something like a new effect in the manner of rendering nearly calm water under sunlight, but it is a little tricky in manner. Mr. H. G. Hine exhibits the opposite qualities of calm repose and delicacy of execution in his beautiful view over the "Downs near Lowest" (145). Mr. Falleylove's various classic garden scenes in the environs of Rome are hardly so effective and finished as others by which he made his reputation for this class of subject; they seem rather too numerous and painted too fast; he contributes a good small-sized view of the interior of St. Mark's. Mr. Annonier is seen to advantage in a scene very different from those which he usually paints, representing "An Old-fashioned Garden" (32), with great masses of sunflowers rising in the midst of the lawn; the one fault of the picture is the want of light in it, or rather of the shadow without which the presence of light is not appreciable in a painting. The same defect mars the largest and most elaborate of Mr. Elgood's studies of old houses and their environs (40); there is positively no light in this; no distinction in tone between the sides of the house which face different ways; the sun has gone out of the heavens. We draw attention to this because there seems to be a growing tendency to this omission of light and shadow effect among a good many painters. Mr. Elgood's smaller work, "The Farewell" (54), is much superior to the larger one. Mr. Wimperis's "Wooded Valley" (61) shows much of his usual good qualities, but the wooded hill in the middle distance is too roughly handled, losing the sense of scale; the trees rather suggest the idea of bushes than large trees. Mr. Joseph Knight's "Spring" (189) is a fine fresh piece of spring verdure, in which the artist has not been afraid of green. Mr. Harry Johnson's "Prehistoric Stones" (44), a view of

Stonehenge by moonlight, rather exaggerates the scale of what are irreverently called in the neighbourhood "the stones," but it is a very carefully elaborated effect. There are other good bits of landscape in the gallery.

#### GATHERINGS FROM ABROAD.

THE difficulties attending the overcrowding of our cities in the present day, it seems agreed, can alone be solved by the supply of cheap and easy means of transit. The owners of "real estate," as we see in London and New York, and where not, find it their interest to favour any spread of railway, omnibus, or tram which may bring the outlying districts of our great cities within easy distance of the business centres. The Elevated Railroad of New York has proved not only commercially successful in itself, but has, as was expected, largely increased the value of property "up-town" (previously only accessible with difficulty from Wall-street), to the injury, it is true, of the older neighbourhoods. The suburbs of London and all our great cities owe their existence to the increased means of communication which have been afforded of late years by the extension of tram and railway lines. And now we hear that our Parisian neighbours are not content with their means of urban and suburban locomotion, and in spite of their well-organised omnibus and cab system, they are seriously thinking of a Metropolitan Railway in the style of ours in London. The scheme, which is no new one, has been elaborated, and we learn that it has been brought to the attention of the Municipal authorities. It is suggested that there should be five lines from various points outside Paris to certain populous centres within the walls. Without enumerating the details of each of these, it may be sufficient to notice that one of those, leading to the Halles Centrales, or Central Market, will be of the utmost use, relieving the streets of a large amount of heavy traffic. The longest stretch of tunnel without light is one of 2,275 metres. Unlike our own metropolis, the two banks of the river will be put in communication by the system. A concession of ninety-nine years is demanded, the first line to be opened within a delay of three years, and each of the others at intervals of two years. The maximum fares would be 20 centimes and half a franc, there only being two classes, but workmen's trains would be run at fixed hours. The carriages would be of the American pattern. The cost of the total network, over 50,000 yards, is calculated at some 150 millions of francs, or 6 millions sterling. The scheme only awaits sanction from the proper authorities to be set on foot. It will, we may be sure, receive warm support from the owners of property in Paris, more especially as of late there has been no small talk of demolishing M. Thiers's famous line of fortifications which hem in the city and confine the population, but we may be sure so serious a step as this will not be taken without mature consideration.

As for the Berlin Metropolitan Railway, or *Stadtbahn*, which has recently been opened, not sufficient attention has been drawn to its real object. It has been regarded, of course, as a municipal improvement; in reality, however, like so many of the great works in Germany, its military importance and utility have been as much considered as any other point. The line singularly assists the transport of troops, avoiding the changing from one terminus and marching through the town to another. The new Berlin Metropolitan Railway, which, it may be mentioned, is not underground, but runs on arches, is, however, in times of peace, of great service to the inhabitants, and every consideration has been given to their comfort and convenience. The arches of the line have been most skilfully utilised and let out for shops, and we hear of a most successful *Bier lokale*, built in *Alteutsche stil* with wooden panellings, &c., in the most approved modern German fashion, having been already opened.

Rapid means of communication seem the great want of modern existence. A French engineer has recently submitted to the Paris municipal council a scheme by which he claims he has solved the difficulty with a saving in expense of 50 per cent. over existing systems, a greater regularity ensured, and accommodation provided for ten times the number of passengers at present carried. His system consists of a species of elevated railroad, affording for foot passengers a covered way and a protection

\* An Arab legend relates that the Pharaohs were giants who, with a wave of their magic wands, knew how to raise huge masses of rock.



against the weather, while leaving the road free for the circulation of carriages, &c. The movement of the omnibus, a long saloon carriage, would, if we understand the system correctly, be directed by means of an endless chain. A speed of something like six to seven miles an hour would thus be ensured with the means of carrying during that time at least 20,000 passengers. The idea, we are disposed to think, will scarcely recommend itself to the municipal council of Paris.

That the belief that all our American cousins care for is the practical is incorrect has long been known to a few. It is, however, not a little interesting to hear of Americans offering not only to subscribe the necessary sums for the completion of the memorial window to be erected in Westminster Chapter-house to the late Dean Stanley, but proposing to do the work themselves. "Why should not the Stanley Memorial Window which America will present to Westminster Abbey be made as well as paid for here?" asked the New York *Critic* not long since. "The art of making stained glass is one of the few in which America can justly claim superiority over the Old World." Every one familiar with what of late years has been done in New York and Boston particularly, to encourage the decorative arts, will understand this otherwise apparently boastful statement, while English readers interested in the subject of decorative art have been singularly neglectful if they have not seen in the pages of the two illustrated American magazines, which have now taken their place among our English publications, enough to lead them to believe in the assertion. At any rate, the glass cannot well be worse than much that is set in England.

As pertinent to the subject of art in America and also in England, the remarks of our contemporary *L'Art*, on the recent publication of the sixtieth volume of the "American Amateur," are not uninteresting. After a suggestive reference to the too general ignorance existing in Europe of the great art movement which is at work on the other side of the Atlantic, our French contemporary draws attention to the active popularisation and propaganda of art and art-teaching in the United States. "It is one proof more of the enormous effort made in America to favour the diffusion of artistic knowledge. This movement has already borne its fruits. It is an indisputable fact that at the present moment all the important artistic publications have far more subscribers in the United States than in England, where," remarks our contemporary, "the tendency of our neighbours to be more or less unconsciously carried away by the great results they have already obtained is each day becoming more manifest. Now this is a fatal tendency. It is only by establishing points of comparison with what foreign nations are doing that our neighbours can continue the progress so far successfully realised,—progress, however, which still has need of wider development to attain the results aimed at. One thing is certain, the movement must be slow. Advance in art matters and in the improvement of taste cannot be made by giant's strides; of all plants taste is the most delicate to nurture and acclimatise."

The restoration of the quaint Loggia del Sigallo, which every one who knows Florence will remember at the corner of the busy Via del'Arco, under the very shadow of Giotto's Tower, and in the immediate neighbourhood of the Baptistery, is by this time completed. The beautiful piece of thirteenth-century work, the design, it is said, of Niccolò Pisano, had fallen into sad state, though we learn that some twenty or 30 years since it was restored. The old lines have, of course, been strictly followed, and certainly in Florence, where the Bargello has been so skilfully recovered from the terrible condition in which it had been allowed to fall, the restorers may be trusted. Professor Castellazzi has directed the work. The frescoes by Gaddi have been also re-touched. It is, perhaps, a matter for congratulation that circumstances prevented the restorer,—as was originally intended,—arriving out, in addition to the necessary repairs, the original intention of the plan, as he conceives it, of Niccolò Pisano. What the result might have been we are, of course, unable to say, but we repeat there is no ground for regret that the Professor was unable to indulge in his somewhat dangerous theories. The restoration, therefore, is all that has been attempted; the rich carvings of the original have been carefully washed, and reappear in all their brilliancy, adding a fresh feature to renovated Florence.

Brittany has long been famous for its so-called Druidical remains; the district of Morbihan is scattered over with these Celtic monuments; they are, however, far from being protected from the Vandalism of the owners of the property on which they lie, and within recent years their number, considerable it is true, has been sadly reduced. Every archaeologist, therefore, will learn with pleasure that one of the most interesting of these mystic monuments, the giant *menhir* of Loomariacque, the largest known in the world, is now preserved for ever from the possibility of injury; it has been purchased and placed under the protection of the Commission des Monuments Historiques. The importance of this monarch of the Breton *menhirs* may be judged when it is stated that it is the height of the Luxor Obelisk in Paris (about 76 ft.); its weight over 250 tons. It is not, however, standing; it lies prostrate in four parts, and it is now proposed to restore it. When, we should like to know, are Stonehenge and the numerous other Druidical remains scattered over England definitely to be protected by legislation from possible injury?

#### THE PROPOSED IMPROVEMENTS AT HYDE PARK CORNER.

We have received from a frequent contributor an article on the proposed improvements at Hyde Park-corner, written before the appearance of our remarks on that subject on April 1st. In the main, the view taken coincides with that we have before expressed; but our correspondent has given a quantitative analysis of the proportion of roadway to traffic, which deserves careful attention, as pointing out the principles on which it is necessary to make definite calculations when traffic presses upon space.

Our contributor remarks that the idea of a viaduct had occurred to him, but that he found considerable difficulty in the levels. The 40-ft. contour crosses Piccadilly at the corner of Park-lane. The 50 ft. and 60 ft. contours are crossed by the Park drive at 10 chains and 16 chains from the entrance-gate. The 30 ft. and 20 ft. contours cross Grosvenor-place at about 8 chains and 20 chains south of the Kensington line of road. Thus in 36 chains there is an ascent of 40 ft., which gives a gradient of 1 in 60, very nearly. As the Piccadilly line crosses this section at a level of from 40 ft. to 30 ft. above high-water mark (to which the above-noted contour heights are referred), it is obvious that it is about equally difficult to effect a crossing on another level above or below the present roadway.

We now let the writer speak for himself.

The plan proposed for removing the block of traffic at Hyde Park Corner is, at all events, not to be criticised on the ground of its timidity. It may, however, be inquired not only whether an unnecessary sacrifice of green turf has been demanded, but, moreover, whether the object aimed at would not be more certainly secured by a less drastic treatment. In face of the rapid and enormous increase of the population and of the buildings of London, every perch of grass-grown ground in such a spot as Hyde Park Corner has a value of no ordinary magnitude. To diminish a broad sweep of turf or shrubbery as little as possible is a *sine qua non* condition of good design. Nor is it for a moment to be allowed that the creation of little detached gardens or shrubberies, of two or three perches area, can compensate for an equivalent destruction of unbroken park.

As to the principle of taking a slice from the north-west corner of the Green Park, we are at once prepared to accept it. But we contend that the public convenience demands two conditions. First, that the addition to the roadway shall be laid down on true stratigraphical principles; that is to say, it shall be so designed as not only to accommodate the traffic as to actual volume, but so also as to avoid the creation of any cross-streams of traffic which it is possible otherwise to deal with; and, secondly, in thus doing, as little space must be deducted from the Park as can be arranged.

By the plan exhibited in the Library of the House of Commons, it seems that neither of these indispensable conditions is fulfilled. The quantity of land taken from the Park is about four acres, or 2.6 per cent. of the whole united area of St. James's Park and the Green Park. Against this deduction has to be set the creation of three little isolated bits of garden, containing, as closely as we can ascertain from the plan, 1 road, 10 perches, and 4 perches respec-

tively. The two smaller of these, at all events, would be little better than desolate dust-traps, and would be less ornamental than open space, with a fine bronze casting on a good pedestal on the site of each.

At the same time, we do not mean to assert that the sacrifice of four acres of turf would be too much to give for a complete solution of the problem before us. But we cannot avoid pointing out that this important question of the intersection of main lines of traffic has been quite overlooked by the advisers of the Board of Works. On the contrary, if the problem had been how to draw as many lines athwart one another as possible, it could hardly have been more efficiently carried out. Across Piccadilly, at the Park entrance and at Hamilton-place; across Grosvenor-place, at Halkin-street, and at Grosvenor-crescent; across the new road, from Hyde Park, and again from Grosvenor-crescent to Constitution-hill; are contrived six crossings at right angles, each of which must cause an alternate interruption of the traffic, which it is quite possible to reduce by at least one-half.

If the leading features of the case are regarded with a little exactitude, it will be seen that the course of traffic has not been studied. The width of Piccadilly immediately east of Hamilton-place is 53 ft., or six lines of vehicles and 5 ft. over. The width of Hamilton-place is 48 ft., or six lines of vehicles exactly. All streets, we think, ought to be arranged in widths of 8 ft., being about the space required for the passage of a carriage and pair at a good trot. Fractions of this width are objectionable, as tending to lead a driver to cut in where there is no through line, and thus to cause block. But as far as both the north and south, and the east and west, traffic at this spot is concerned, six lines of vehicles abreast in each direction is as much as can come on or go off the ground.

The Park gates give passage to three single lines, running north and south. The Knights-bridge-road is more capacious. But however the traffic may converge from west, south, and north, opposite the Wellington Arch, the limitation to six lines by Hamilton-place and Piccadilly is precise, and no increase of width to the west of this spot can increase the capacity of Hamilton-place and Piccadilly.

Now, to take the volume occupying this 96 ft. of useful, and 101 ft. of actual width, the plan of the Board of Works provides the unnecessary width of 140 ft. And we hold that it cannot be denied that to bring two roads of 70 ft. each (or of 64 ft. of useful width), to pour their traffic into two roads of 48 ft. each, is to provoke block. Again, the width allowed from Hyde Park Corner to Halkin-street is 60 ft.,—an awkward width of seven vehicles and 4 ft. to spare. Thus, whatever has been the principle on which the width of the new roadways has been determined, it evidently has in no way been proportioned to the largest possible volume of traffic that can pass through the neck.

In the next place, as before hinted, the intersections are aggravated instead of being alleviated. If the fence of the Park were set back from Hamilton-place to Halkin-street, so as to allow of a roadway of 96 ft. in width for the east and west line, and one of 64 ft. in width for the Grosvenor-place line, with a gentle rounding of the north-west corner, we are convinced that the coachmen would find such an arrangement far better than that now proposed, and the slice thus taken from the Park would be almost imperceptible.

It may be said that we have treated the question too much on geometrical grounds. Our view is, indeed, a mathematical one; but it is, notwithstanding, eminently practical. When there are plenty of space and plenty of time for coachmen to play with, it would be pedantry to map out the course of a gentleman's carriage in yards and minutes. But we have got beyond that in London. The art of driving through the crowded streets is one requiring a high order of practical excellence. The most famous Roman charioteers came, if we remember aright, from the Island of Capri, and wonderful feats of charioteering are still displayed by the Capri and Campanian drivers, who are not in the habit of putting bits into the mouths of their horses, but employ a curved bar outside the animal's nose. But a Neapolitan or Roman coachman would be utterly floored in London. His vehicle would be smashed before he had driven a mile in the high-tide of fashionable transit, and so serious is the question of block, that in any case of laying down a new street it



is essential to know beforehand what will happen. As the trains on trunk railways are laid down on accurate diagrams, so must the carriage traffic over fully occupied roads be, if we wish really to avoid block. Let any one who doubts our position count the carriages that pass within four or five hours backward and forward between the points we have indicated, as well as to and fro Hyde Park, from and to east and west. If he do not find mutual yielding,—that is to say, slackening of pace or actual stoppage,—to be now unavoidable, no case will be made out for driving a new road through the Park, but if he do, as, of course, he will, he cannot, as far as we can see, avoid the conclusion that this particular diversion of the cross traffic will greatly aggravate the mutual interference of the main streams of vehicles.

With extra but proportionate width of road,—the directions of the traffic remaining as at present, with the farther advantage of removing the direct cross line from Park to Park,—all that can be done would be done, and done in the most available manner. The question will be put, is it worth while to move the Wellington Arch for so short a distance as would be thus required? The reply is that it is proposed to move it under any circumstances, and that whether it is moved a longer or a shorter distance can only matter if we find ourselves able to introduce the American method of shifting the structure intact; in which case the less distance it is moved the better. As to this, however, we must call attention to the fact that the relative position of the two gateways is a matter of architectural harmony which ought not to be decided by mere rule of thumb. It requires careful consideration; and should be thoroughly studied before it is carried out. We must be permitted to question whether the oblique position of the arch with reference to all the other architectural lines in the vicinity which is indicated on the plan would have a good effect.

May we add that if one result of any change is to give a more appropriate pedestal to the statue of the great Duke, this part of London will be relieved from a disgraceful nightmare?

In brief, then, we are prepared to admit that public convenience demands some sacrifice of the precious breathing space of the Green Park. But we think that an unnecessarily large sacrifice is made by the Board of Works plan. Even as to that, however, we should be disposed to be acquiescent if we felt that, from the coachmen's point of view, the gain to the convenience of the traffic was such as to counterbalance the loss. But we have regarded the subject from two points of view,—first, that of the surveyor; and secondly (and not without long experience in handling the ribbon), from that of the coachman. From both these points of view we are more than half disposed to conclude that the block would be intensified rather than removed by the present plan, which, undeniably, is like pouring through a wide-mouthed funnel into a narrow-necked bottle. We hope, before 26 per cent. of the Park is sacrificed, that we shall, at least, have the assurance that the stratigraphical requirements of the spot have been properly regarded, and that it will not have been taken as enough to make roads 70 ft. wide running in every possible direction, but tending to an unavoidable throatle-valve.\*

#### THE LATE MR. D. G. ROSSETTI.

THE death of Mr. Rossetti last week removed from among us a painter who held a very peculiar place in the world of recent English art. Practically unknown to a large majority of those who are interested in painting, he was extolled by a small esoteric sect of worshippers as the greatest painter of the day, and their praise, to some extent, raised around the painter's name a celebrity which was in great measure due to a faith, on the part of a certain section of the public, in the verdict of "critics" upon works which none but their purchasers and a few favoured friends had ever seen. Among the notices of the painter in the columns of daily papers we have observed expressions of surprise at the degree of fame which had been achieved

by one who had appeared to shut himself out deliberately from ordinary modes of publicity. Such surprise we do not share, for a double reason. In the first place, the extent of the reputation which Rossetti really had achieved as a painter has been considerably exaggerated. His special worshippers, who knew and lauded everything he did, seem to have been, and still to be, under a kind of pleasing delusion that their idol was as well known to all, and as much worshipped by all, as by themselves. The fact is, that to a great number even of well-informed people outside of the esoteric circle referred to, he was only a name. On the other hand, we see no matter for surprise in the extent of the reputation which Rossetti did enjoy among a good many who had perhaps hardly seen his paintings. No doubt the usual and natural way to make a reputation is for a man to get his works before the world as much as possible. But the opposite plan, of refusing to let any one see them, while leaving it open to a circle of friends to talk about them as something very remarkable, has its practical advantages also, and is, even from the point of view of worldly wisdom, not a bad way of gaining reputation in a day when there are so many people with a taste for *caviare*. This, it appears to us, is a good deal what happened (whether by his own direct intention or not) in the case of Rossetti. His friends diligently assured every one that he was a very great painter whose pictures were quite beyond the understanding of ordinary people; and not unnaturally they found a considerable number who were quite willing to take rank as an intellectual aristocracy, by admiring, even if it were on trust only, what was so much above ordinary comprehension.

How far this, as it seems to us, factitious reputation, was accepted or approved by the painter himself, how far it is due only to the ill-regulated enthusiasm of partisans, we do not profess to understand. Our own opinion, based on the inspection of a fair proportion of Rossetti's works in private hands, is, that a very large discount must be made, and will certainly be made, whenever a general public exhibition of his paintings may be held, from the estimate made of his genius as a painter by those who seem to take pleasure in acting as his apostles. We cannot profess to extend our knowledge to his latest works, as, after one or two experiences, we may candidly confess that we never cared again to go through the ritual of adoration, which seems to be the price expected in return for the privilege of an inspection of the collections made by those who have been the principal admirers and purchasers of his works. But unless the style and the quality of Rossetti's art have been very materially modified during the last few years, we should characterise it as a style of painting combining, in the most singular and unprecedented manner, great power, brilliancy, and richness of colouring, with utter indifference to truth of form and apparently an almost phenomenal incapacity to draw,—phenomenal, that is to say, in the case of a painter with such remarkable power as a colourist. As far as we have seen them, Rossetti's figures, his women especially (he painted women much more than men), were in the first place, and apparently with deliberate intent, formed unlike natural figures; and in the second place, not unfrequently, he failed even to represent the attitude or the anatomical form which he seemed to have intended to represent; the foreshortening of an arm appeared to be a problem beyond him, or else deliberately contemned. In regard to the subjects and the aim of his art, he must unquestionably be admitted to have been a painter who aimed at the ideal, who wished to make his painting a form of poetry; and with such an aim in the abstract we should earnestly sympathise, more especially in view of the fact too prosaically realistic tendency of much modern painting. But the ideal in art must be reached through, must be expressed in terms of, the real, so to speak. All our experiences are so closely bound up with the forms and processes and construction of nature, that it is to no purpose that a painter attempts to grasp at an especially ideal expression by neglecting, or, as he supposes, improving upon nature. This appears to have been the process, whether carried out with entirely deliberate intent or not, in Rossetti's painting. In fact, he acted tacitly on the principle which Fuseli openly and frankly professed, that "nature put him out"; and though he was as wide as the poles asunder from Fuseli in some respects, the abnormally long legs and exaggerated action of Fuseli's

figures, which are laughed at now, were no more absurd than the abnormally long necks and great red lips of Rossetti's women, which a future generation of æsthetic critics will probably laugh at in their turn. In regard to the type of female beauty which Rossetti constantly painted, we must also express our opinion that it was (however intended) anything but a lofty or ideal one in fact, and represented, on the whole, a sensuous passion without any of the higher qualities of womanly tenderness; a view in which some of the painter's own admirers among journalistic critics have certainly tended to confirm us, by their sickly way of hovering, in print, over the details of these languid masks of sensuous beauty, uninformed by any intellectual or moral greatness of expression.

Our belief is that Rossetti's genius was in reality much more that of a poet than of a painter, and that he stands higher in virtue of some of his poems than any of his paintings can legitimately place him. Detailed criticism of his poetry would, however, be beyond the limits to which we restrict ourselves. Our opinion upon his merits as a painter is based, as we have said, upon that proportion of his works which we have been able to see. If those who have the custody of his pictures, and those who are the natural guardians of his artistic reputation, choose to appeal to public judgment by a general exhibition of his works, and if such an exhibition should disclose qualities which are not apparent in those of his works which we have already seen, we shall be ready to modify our opinion accordingly. So far as we can judge, without going out of our way to seek further acquaintance with his paintings as a matter of private favour, which we do not care to do, our impression is that Rossetti's claims to fame as a painter consist in his having been a remarkable colourist, and an artist possessed at times of very fervid conceptions, which he had not technical power to realise satisfactorily; and that he made the mistake of striving to be ideal by being unnatural, by ignoring the forms and feelings of real life and of healthy human nature, and by painting scenes and figures which are those of a dream (we might sometimes say, of a nightmare), and which, though not without a certain power, affect us with a disagreeable sense of eccentricity and of misdirected aims. If we express our opinion rather freely, it is from no unkindness towards the memory of a man who was, no doubt, a man of genius, but because some sort of protest is needed against the extravagant and often foolish adulation of his clique of admirers, who endeavour to thrust their views upon us "against the stomach of our sense," and who have only themselves to blame if those who are in a more sane state of mind are tempted into speaking a little ungracious but necessary truth in return.

#### EDWARD DUNCAN, PAINTER IN WATER COLOURS.

WE record, with regret for his loss, the death of Mr. Edward Duncan, member of the Royal Society of Painters in Water-Colours, which took place on the 11th inst. He was born in 1803, within a mile of where he died. Like some other of our great artists, his father was an engraver, as, indeed, was Duncan himself for a time. Duncan's father used to engrave the paintings of Mr. W. J. Huggins, of Leadenhall-street, a marine artist of sufficient standing to obtain from William IV. a commission to paint two pictures, "The Battle of Trafalgar," now at Hampton Court.

Young Duncan was brought into contact with Huggins's family in carrying his father's proofs backwards and forwards, which led to intimacy, ending in his marrying Miss Huggins in 1831. As Miss Huggins was, in every sense of the word, an artist, she induced her husband to abandon engraving, and devote himself to drawing. We have before us a sketch by Duncan in water-colours, made in 1820, a "View of Old London Bridge from the Old House Quay," in which we can count 150 figures, all miniatures, and the worst that can be said of it is that it is like a modern coloured photograph, and painfully correct. Mr. Duncan was always free to admit that he had to thank the late Mr. Ingram and the *Illustrated News*, in a great measure, for his ultimate success in life as an artist.

He will also be remembered as supplying annually the drawing for "The Stationer's Almanac," some of which he engraved himself. Mr. Duncan, as a water-colour artist, stood

\* Having allowed one contributor to point out what he considers the weakness of the official scheme, we have, in another page, set forth the plan of a second contributor, which presents claims for consideration. It does not attempt to deal with the crossing of the east and west traffic by that of the north and south at Hamilton-place, but, as it seems to us, it will do efficiently all that the Office of Works' plan proposes to do without taking down the arch, and with much less sacrifice of the Park.



high, — equally good in every department as in his marine subjects. His "Life-boat," "Landing Sheep at the Mumbles," "Gathering Sea-weed at Jersey"; his river views, landscapes, farm-yards, and cattle (all by his own hand), are equally perfect. He was a very industrious man. Hardly in England a drawing-room owned by any one of taste but has drawings of his, and his studio contains hundreds of his original sketches, which, no doubt, when they come to the hammer, will be anxiously sought after.

He was a very liberal man too; kept an open house, a dinner party weekly; and his billiard-room open to all comers.

He brought up a large family, and died, leaving his wife an ample income, and something for all his children, all of which was earned by his own unaided pencil.

He had a good word for every one, more especially for young and struggling artists.

#### THE LATE W. BURGESS AND HIS WORKS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of this Institute held on Monday evening last, Mr. Horace Jones, Vice-President, in the chair,

It was announced that Mr. Law, of Northampton, a Fellow of the Institute, died on the 14th inst.

##### The Obligatory Examination.

The secretary announced that the Council had that day received a communication from the Board of Examiners under By-law 14, to the effect that of twenty-two candidates who presented themselves for the March examination, seventeen had passed with credit.

Mr. R. Poplewell Pullan then read a paper dealing with the life and works of his brother-in-law, the late W. Burgess, A.R.A. He commenced by observing that it might be broadly stated that it was very seldom that any great artist received his full meed of praise during his lifetime. There were, unfortunately, so many competitors in the race for fame, many of whom were actuated by feelings of jealousy towards the manifestly superior man, and these circumstances very frequently so overshadowed the career of a great artist that it was seldom that a clear view of his merits could be obtained during his lifetime. It was only when he was dead that people were able to take a calm view of his life, and to place him in his proper niche in the Temple of Fame. This was true of artists generally, but it was especially true of architects, because architects did not appeal so much to the senses, but more to the intellect, than artists who were sculptors or painters. It required many years to cultivate a thorough appreciation of architectural work, so that although an architect might live to a ripe old age, it was not often that his works were properly appreciated in his lifetime. Mr. Burgess had, by many years of patient labour (of which his numerous volumes of sketches, some of which had been acquired by the Institute, were evidence) mastered the principles and thoroughly conquered the details of the particular style which he affected. Although his capabilities as a designer were recognised, there were few who were qualified to appreciate the research manifested by his works. He was undoubtedly the first of the art-architects of his day. By "art-architect" the author meant not only an architect capable of designing good architecture, in the limited sense of the word, but one who was thoroughly at home in designing all the adjuncts of a work of architecture, whether such adjuncts took the form of mosaics, tile pavements, stained-glass windows, or furniture. That he was the most eminent, profound, and versatile art-architect of his day, the numerous drawings and photographs exhibited of some of his works would testify. He was certainly pre-eminent in his peculiar branch of art, — French Gothic of the thirteenth-century period. In character, Burgess was emphatically what Mr. Beresford Hope had described him, — a noble-hearted man, a man of extreme generosity, and this was especially shown in the liberal manner in which he imparted information, not only to his pupils, but to all those who inquired of him. To the general public he imparted the results of his studies by lectures and writings almost innumerable. His open-handedness and liberality had their effect upon his generation, for no architect's works had been so frequently copied or imitated, at least in portions, as those of Burgess. One did not find that the work of Sir Gilbert Scott

or Mr. Street was copied; but in many streets of London were to be seen imitations of Burgess's peculiar style. True, the style was open to all the world, but the plagiarism had extended to features which Burgess had made essentially his own, and which were sometimes bodily appropriated. Another trait in his character was the exceeding conscientiousness with which he carried out his work. He would never undertake a work which he should not have funds and leisure to complete. Cork Cathedral was commenced in 1863, and was not yet finished. The works at Cardiff Castle, commenced in 1866, were still in progress. A minor trait in his character, but one which had nevertheless exercised a great influence over his works, was his boyish playfulness and perception of the comical element in life. He was extremely fond of animals, and this love of animals was seen in the birds and beasts which formed so conspicuous a part in the detail of most of his works. He delighted in dogs, and used to keep three in his chambers, and they did not always welcome his clients in a friendly manner. On leaving King's College he was placed with Mr. Blore, the foremost Gothic architect of his day, and who had charge of Westminster Abbey and Lambeth Palace. He subsequently spent a considerable time in making tours in France and Italy. His first success was when, in 1856, in conjunction with Mr. Clutton, he obtained the international competition for Lille Cathedral. His second success was the gaining of the first prize for the Memorial Church at Constantinople. In these competitions Burgess obtained his spurs. The way had been prepared for his successes. The writings of Britton and Pugin in England, and of Viollet le Duc and Didron in France, had turned public attention to the native styles of architecture. Competitions in those days were determined by committees of men of taste and learning, and were not left to the decision of a single individual. Burgess's art was essentially masculine, his treatment of it bold and vigorous. He delighted in those positive colours which were used in the great periods of art. Indeed, he looked upon colour as the natural complement of architecture. He was a learned archaeologist, and brought all his learning to bear upon his art. He was an incessant reader, Medieval romances and inventories of all kinds claiming a large share of his attention. He read little that had no bearing on the work of the architect. He was the best iconographer of his day, and most of his works were complete poems, requiring a good acquaintance with Medieval literature to enable one to properly understand them. He must be judged, however, not only by what he carried out, but by what he wished to carry out. For instance, his design for the Memorial Church at Constantinople was a very fine one, but was found to be too costly. He reduced it twice, but on being asked after that to remodel it entirely, he refused to do so, and the commission was eventually given to Mr. Street. One of the points which he was asked to concede was the abolition of the stone groining with which he proposed to cover the church. He refused; but at a subsequent period of his career he came to the conclusion that stone vaulting was not a *sine quâ non* of thirteenth-century churches. His visit to Constantinople, however, was not without good results on his after-works, in which, as at Cardiff Castle, there is a certain infusion of Eastern art with the Gothic. The Cathedral of Brisbane, in New South Wales, was, perhaps, the least satisfactory of his church designs. It was, Mr. Pullan thought, much to be regretted that Burgess was not more extensively employed on restorations. Waltham Abbey was his chief work in that direction. The Cathedral of St. Finn Barre, Cork, was undoubtedly his greatest work. He gained it in 1862, in competition with sixty-three other architects. It is one of the smallest and most compact cathedrals in existence. In the sculpture, which was very creditably carried out by Mr. Nichols, the architect had displayed his profound acquaintance with iconography. Altogether the building was the most complete example extant of a structure carried out in one style, — that of the thirteenth century. Fortunately for Mr. Burgess his work at Cork was highly appreciated by the Dean and Chapter. Two of the most notable of his churches were the one erected for the Marquis of Ripon at Studley, and the one for Lady Mary Vyner, at Skelton. Both these churches were Geometrical in style, and thoroughly English in character. Although both were in the same style, and of about the

same size, they were utterly dissimilar in design. He erected many other churches. His design for Edinburgh Cathedral was one for a noble church, and it was the most picturesque of the designs sent in, but it did not gain the victory, possibly because it was in the Early French style. The Marquis of Bute, whose archaeological taste and knowledge led him to appreciate the like qualities in Burgess, employed him to restore Cardiff Castle. To enable him the better to do this, Burgess first of all visited and studied other castles in the Principality, such as Conway and Caerphilly. In this and other of his works he had shown that he was not a bigoted adherent of the thirteenth century, for in them he had practised an enlightened eclecticism. Pierrefonds, restored by the Emperor Napoleon III., and Cardiff, restored by the Marquis of Bute, were the only two castles which had been thoroughly restored in accordance with their condition in the thirteenth century. The restoration at Cardiff was most complete, even to the portcullis, which was not formed of the thin lath-like timbers shown by Pugin, but of solid timbers, shod with iron, and raised by machinery. Upon its contrivance and arrangement Burgess spent more time than many of his contemporaries would expend upon the arrangements of an entire house. One of his most important public buildings was the College at Hartford, Connecticut, U.S.A., not yet finished. This had a frontage of 1,020 ft. He also designed the Grammar School at Ripon and the School of Art at Bombay. At the time of his death he was engaged in building a town-hall at Dover, adjoining the ancient Maison Dieu. His realisation of a Medieval house was very complete. Knight's Hayes, built for Sir John Amory, was one of his best examples. It had long been his ambition to build himself a house in which he could indulge his taste for the beautiful to the utmost. He secured an eligible site in 1874, when a portion of Holland Park was cut off. The house was not yet finished, and would take some years to fully complete in accordance with his designs. Everything in it, from the furniture down to the utensils and knives and forks, had been made from his designs. The decorations throughout were most elaborately and quaintly designed. Similar in plan to his own house was the one which he had built for Mr. Macdonochie at Cardiff. Although Burgess had a special affection for Gothic, the versatility of his taste enabled him to appreciate the merits of other styles. His scheme for the decoration of St. Paul's was a graceful and complete iconographically-arranged design. It was certainly Medieval in character, but it was Italian Medieval, and suited to the building, for St. Paul's might be described as an Italian Medieval building. As to his design for the Law Courts, he had heard competent critics express regret that it had not been carried out. After noticing one or two other designs by Mr. Burgess, notably that for a fountain at Gloucester, Mr. Pullan concluded by observing that, as it was not likely that the same combination of circumstances which produced William Burgess would occur again, it was hardly likely that we should ever look upon his like again.

Mr. R. Reynolds Rowe, of Cambridge, followed with a few notes descriptive of the alterations and additions carried out by Mr. Burgess for Lord Carrington, at Gatehurst, near Newport-Pagnell, formerly the seat of Sir Everard Digby, of Gunpowder Plot celebrity.

The Chairman, in inviting discussion, said the thanks of the Institute were due to Mr. Pullan and Mr. Rowe for the able manner in which they had brought before the meeting some of the circumstances connected with the career of their lamented friend Burgess, whom he had known for some five-and-twenty years as a pleasant and genial friend. Those who had known him could easily recall some amusing anecdotes of him, or some piece of good-natured satire to which he had given utterance.

Mr. Fowler, in proposing a vote of thanks to the readers of the papers, said he had the pleasure of knowing Mr. Burgess intimately for a great many years. Although Burgess possessed great knowledge, it was only when one had known him for some time that one became aware of the fact. He did not at all obtrude his knowledge; on the contrary, he seemed rather to be a man who only affected to be quaint. From very intimate acquaintance with him at an early period he was enabled to say that circumstances were by no means encouraging to him in the pursuit of his art. Although he might have had his way smoothed for him, it was rather made



rough than smooth, and it was only when he had achieved success that he was encouraged in those quarters where he might have looked for encouragement at an earlier period.

Mr. Ewan Christian, in seconding the motion, said that although personally he had only had a limited acquaintance with Mr. Burgess, he saw enough of him to know that he was one of the most "thorough" men he had ever met with. He never did anything imperfectly when he undertook it. He had shown that he knew how to wait for success. Nowadays every architectural pupil wanted to set up in practice on his own account as soon as he completed his articles. Not so Burgess. He determined from the very first to take abundant time for study, and to work diligently to make himself a master of his art before he began to practise. If he promulgated that advice amongst his pupils and the younger men of the profession, he could not, by any possibility, have given them better advice. With regard to his design for the cathedral at Edinburgh, he (the speaker) had an opportunity of thoroughly examining it, and he could only say that it was one of the most lovely pieces of design that he had ever seen, and was thoroughly and completely studied and worked out in every detail. He should have been glad if it could have been executed, but it was not in accordance with the taste of the Scottish folk. As to his proposals for the internal decoration of St. Paul's, however, it was, he thought, a very good thing that it had never been carried out, for it would have ruined his fame. Mr. Pullan had spoken of the care which Burgess had bestowed upon the restoration of a portcullis, but he could not help thinking that in that instance their deceased friend's time and talents had been thrown away. What did we want with portcullises in these days of heavy artillery?

Professor Roger Smith, in supporting the motion, said that as an old friend of Mr. Burgess he could not refrain from testifying to his admirable personal character. He thought that many persons were unaware of the high worth of Mr. Burgess's character, and of the large fund of genuine courtesy and kindness which was to be found beneath his playful and sometimes rather brusque exterior. He did not know any man from whom he had received so much courtesy. He had the good fortune to have something to do with procuring him the commission for the Bombay School of Art, and he never seemed to forget it. Strongly Mediceval as he was, even to the extent of portcullises, he was by no means a one-sided student of architecture. His appreciation and love of Greek art were great, and his knowledge of Italian art was not only great, but practical. With regard to his scheme for the decoration of St. Paul's, and which had, unfortunately, failed to secure Mr. Christian's approval, he (the speaker) thought that it showed a thorough appreciation of the style in which it was designed. He further ventured to think that it was Burgess's greatest work, and that its non-execution was the most unfortunate thing in his career. If it had been carried out it would have made the cathedral as magnificent inside as it was grand externally. What might be the result now, with the present divided counsels, one almost dreaded to think.

Mr. C. F. Hayward suggested that next session, and possibly later on, the Institute should give further time to the study and consideration of Mr. Burgess's remarkable works.

Mr. Hansard observed that Mr. Pullan had said nothing as to Burgess's extraordinary talent as a designer of goldsmiths' work and metal work generally. In one of his books of designs which had been secured for the Institute would be seen evidence of his intimate acquaintance with this branch of art. He not only knew how to design, but how to polish and fix the smallest portion of the work.

The motion having been carried, Mr. Pullan briefly replied, saying that, owing to shortness of time, he had only read about half the matter contained in his MS.

It was announced that the large collections of drawings and photographs shown in illustration of the paper would remain on view in the rooms of the Institute, 9, Conduit-street, for a few days.

**York Minister.**—The Dean and Chapter of York have appointed Mr. G. F. Bodley architect in charge of York Minister. Mr. Bodley is a native of Hull.—Times.

#### RECENT DECISIONS IN RELATION TO BUILDING AGREEMENTS.—I.

WHEN the vast amount of building and laying out of estates for the erection of houses is considered, the importance of some knowledge of the current state of the law in regard to building agreements by those who are concerned with this subject cannot be overestimated. Of course, it may be said that the lawyers of the interested parties are the persons to keep their clients out of legal trouble; but, unfortunately, lawyers, like doctors, are too often called in after the mischief has begun, and have to enable a man, not to avoid a possible trouble, but to get as best he can out of it. "A little learning," wrote Pope, "is a dangerous thing," and so it is, especially in law, if the possessor of the little trusts wholly to it; but, on the other hand, if it puts him on his guard, and causes him when he has a doubt upon a legal or semi-legal point to take technical advice, it appears to us that the little knowledge has proved a very fortunate possession.

The cases upon which we propose to comment will all enable a person who is aware of them to avoid future dangers in regard to building agreements, but they are not sufficiently connected to enable us to comment upon them as a whole, and, therefore, each of the three decisions must be separately touched on. The first to which we would refer is that of *Laird v. Briggs*, 19 Law Reports, Chancery Division, p. 22; and though in the report it is involved in many highly technical details, yet the result of it is sufficiently clear. Briefly stated, the main point involved the question as to the position of a builder under a building agreement, namely, whether he was, in any sense, a possessor of the land upon which his operations were taking place, so as to enable him to bring an action against a person making certain claims on the portion of the estate in question. Especially in connexion with various rights under the Prescription Act, the decision may have considerable importance, but, apart from that point, the position of a man who is in possession, and who is only on the ground by permission, is sufficiently different to make it advisable that he should not believe that he has one character when he has in fact another. But we must give this further warning that though the decision in question arose on the terms of a building agreement, it does not necessarily apply to every agreement, whatever may be its terms. Laymen are too apt to forget this, and very naturally to apply legal decisions sometimes too widely and absolutely. The agreement out of which the dispute arose was not only for the purpose of erecting houses, but of laying out carriage-roads, &c. First of all a right of entry on the land was given to the builder, and then it proceeded, "he will, at his own expense, form an embankment on the foreshore, and keep the same in repair," and then, "at his own expense will lay out and form on the embankment a carriage-drive and promenade in a substantial manner, and streets." Then came a clause by which such part of the land as should be required by the surveyor was to be preserved for building sites, and for garden, yard, and courts, to be erected; and next came an arrangement that the builder would erect a certain number of houses. The 20th clause was of considerable importance, for it stated that "these presents are intended to operate, and shall operate, as an agreement only, and not as an actual demise of the several parcels of land hereby agreed to be demised, or the buildings thereon to be erected, shall not give the tenant any legal interest in the said parcels of ground respectively, until the leases thereof shall be executed, except so far as to create a strict tenancy at will on the part of the tenant upon the terms aforesaid." Now let us see how, in a few words, the Master of the Rolls put the result of this agreement. He stated that there was to be a tenancy at will of the building sites, but not of the roads, embankments, or drives. As regards these, the builder had a mere "right of entry as any other workman would have, but that does not give him possession any more than the master-builder or the bricklayer who is building houses for a man on his own land has the right of possession." In some instances agreements for leases do not contain any stipulation as to there being a tenancy at will; in others it is distinctly expressed. One practical result of this decision would be that such an entry on land as occurred in this case would not be a possession which would raise a title within the

Prescription Act. The two other cases are somewhat akin to each other, and quite distinct from that which has just been noticed, and we therefore defer our comments upon them for another occasion.

#### GLASGOW INSTITUTE OF THE FINE ARTS.

##### ENTRANCE DOORWAY.

We give a view in our present number of the very handsome and well-studied doorway of the new buildings erected for the Glasgow Institute of the Fine Arts from the designs and under the superintendence of Mr. John James Burnet, architect, of that city. His designs for these buildings obtained the first place in a limited competition of six Glasgow architects, which took place in May, 1878; the construction was begun in October of that year, and the galleries were opened to the public on the 1st of February, 1880.

The site is on the south side of Sauchiehall-street, one of the main thoroughfares to the west end, and is about 95 ft. square.

The street floor is occupied by shops, having an *entresol* above them, and the galleries are on the first floor. Of these there are six. The sculpture-room is 35 ft. by 24 ft., and through it one passes to a room on either side, 30 ft. by 35 ft., from which galleries, 24 ft. by 18 ft. and 26 ft. by 19 ft. respectively, lead to either end of the large gallery, 94 ft. by 30 ft., which occupies the whole back of the site, and is, like all the rooms but the two smallest, 20 ft. high to the ceiling, and about 30 ft. to the ridge of the skylight.

The staircase, 24 ft. by 24 ft., enlarged on the gallery-floor by the addition of two wells, 24 ft. by 8 ft., giving light to the shops, is situated in the centre of the building, and is reached from the vestibule, 55 ft. by 24 ft., which occupies the centre of the front on the street-floor, by a flight of ten steps about 10 ft. wide. In the staircase a central flight of steps, 8 ft. wide, leads to the mid-landing, from which two flights of steps, 6 ft. broad, lead to the gallery-floor.

The secretary's rooms, ladies' and gentlemen's cloak-room, and refreshment-room, are reached from the mid-landing.

The whole of the galleries are in timber (yellow pine) stained of a golden colour and dim-varnished; the vestibule and staircase are in plaster, tinted very slightly with pale yellow and brown; and the roof of the staircase is of wood stained dark, and decorated with red, gold, and black.

The contractors for the work were,—mason, Mr. John Maxwell; joiners, Messrs. Keiller & Black; plasterers, Messrs. Thos. Miller & Co.; plumbers, Messrs. Brown & Young; and painters, Messrs. Anderson & Carlton.

The sculpture was executed by Messrs. J. & W. Mossman, and the carving by Mr. James Young. The estimated cost of the building, not including painting and furniture for galleries and shops, was 13,700*l.*; and the actual sum expended was 15,785*l.* 10*s.* 9*d.*

#### CORNWALL MANSION, NEAR QUEEN'S GATE, SOUTH KENSINGTON.

The illustration we give is a view of a house recently erected in the centre of Cornwall-gardens.

Externally the walls are faced with white Burham bricks. All the ornamental features and dressings on the four fronts are executed in Portland stone. The carving was carried out by Mr. Seale, of Walworth. Internally the house has been expensively fitted and finished, having oak parquetry floors, dados, and joiners' work to the principal rooms, and marble floors, pilasters, and columns to the hall and staircase.

The walls and ceilings have been richly decorated in the Adam style. Speaking-tubes and electric bells have been laid throughout.

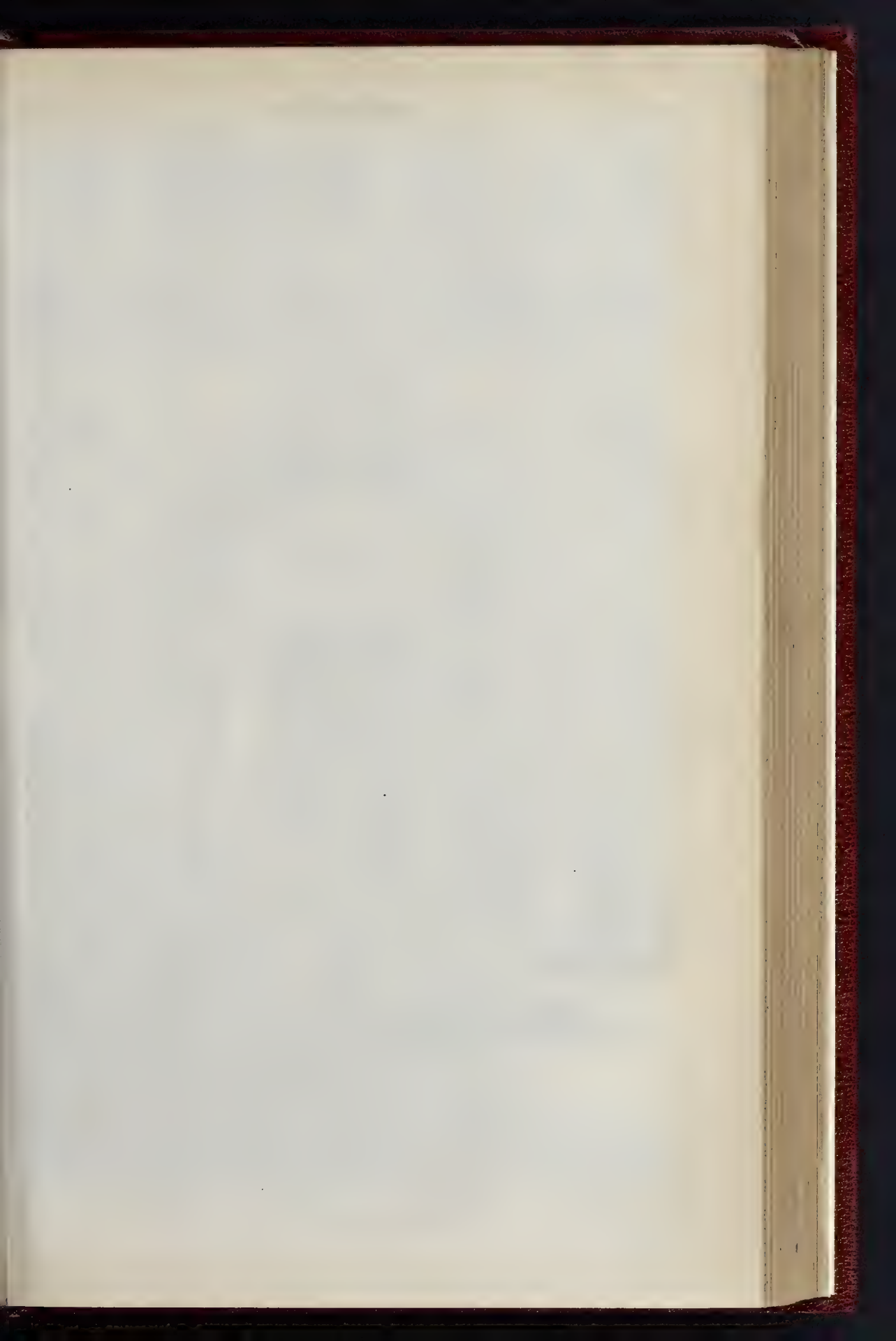
The kitchen, serving-room, and other domestic offices, are placed in the basement, with all the requirements of a first-class town establishment.

The works have been carried out by Mr. Wm. Willett, of South Kensington; and Mr. J. T. Smith, of 19, Parliament-street, was the architect.

#### BALHAM HOUSE, BALHAM HILL.

ACCORDING to promise, we publish plans of this house, view of which was given in our last, p. 430, &c., ante.

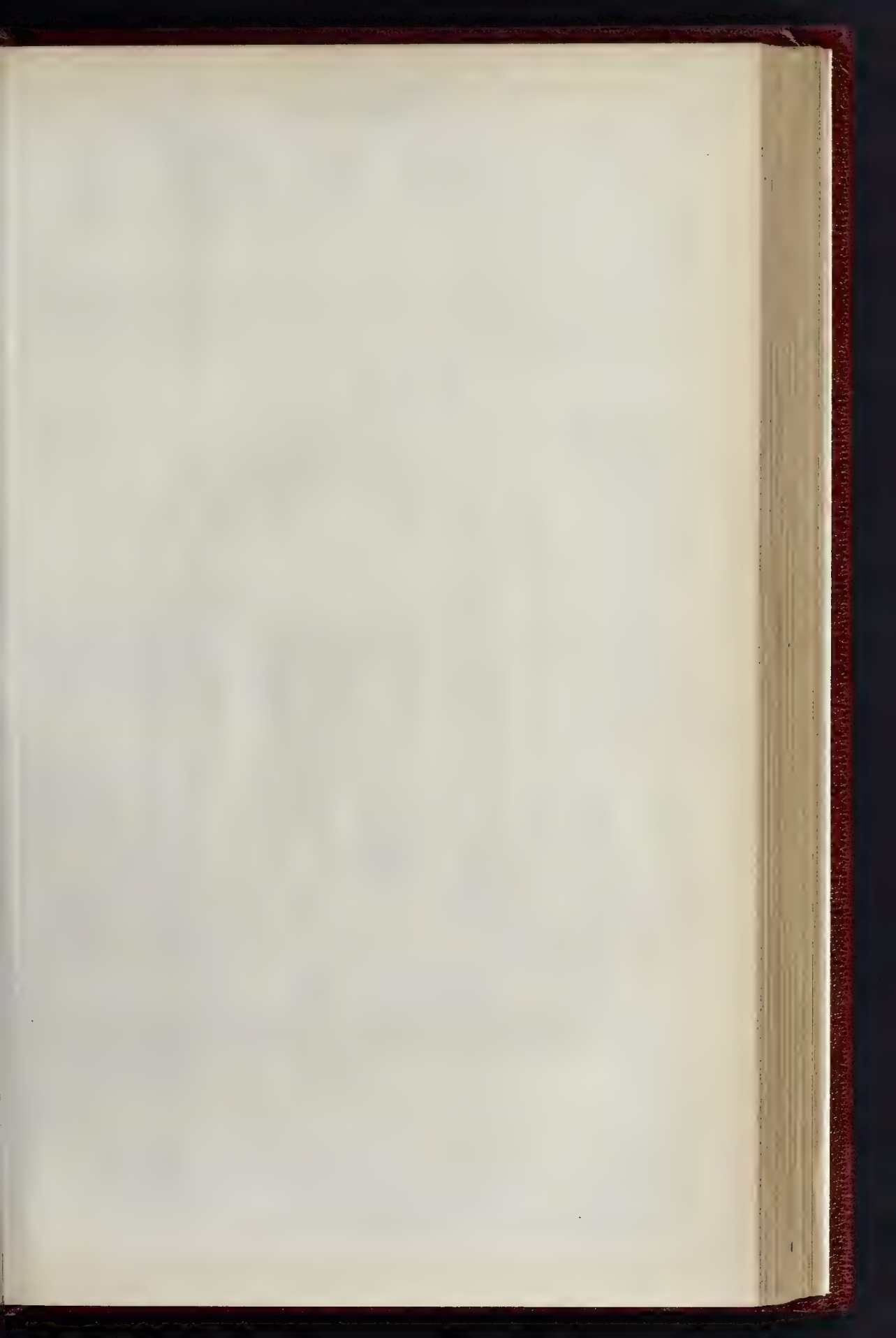


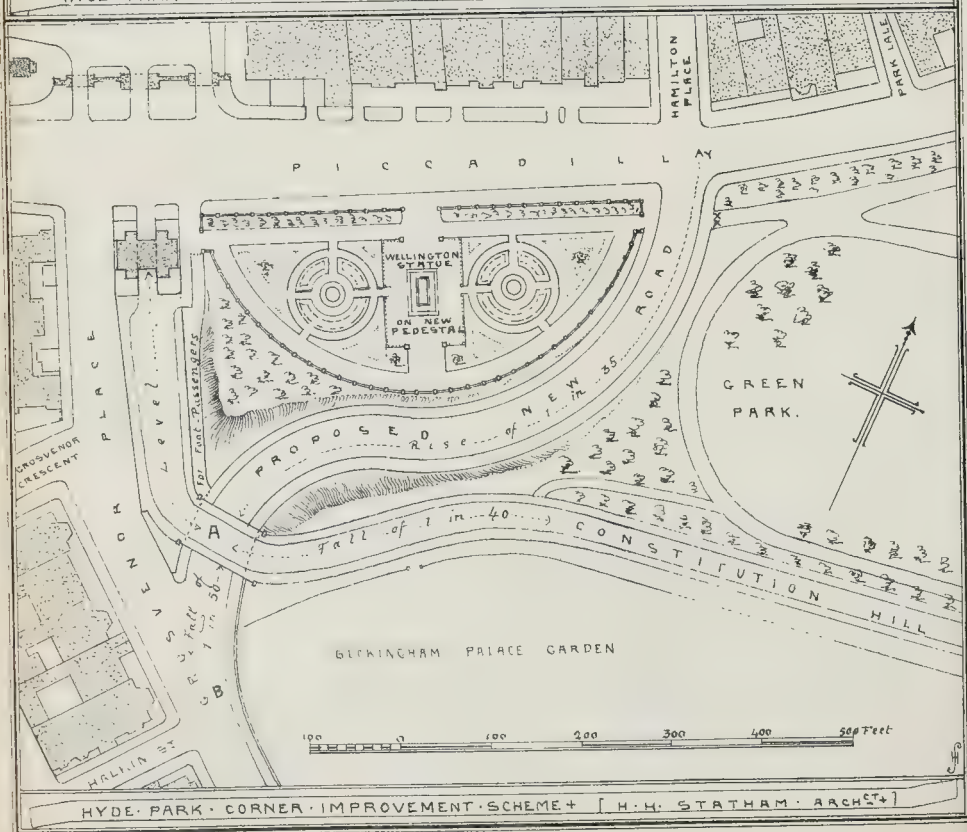
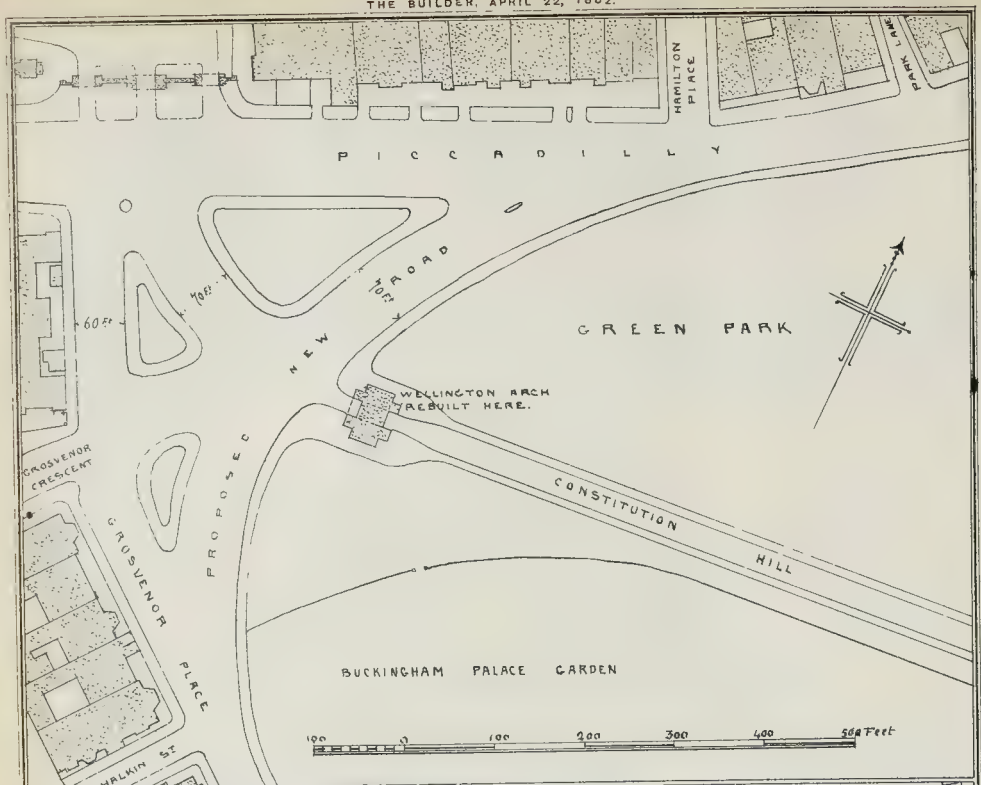




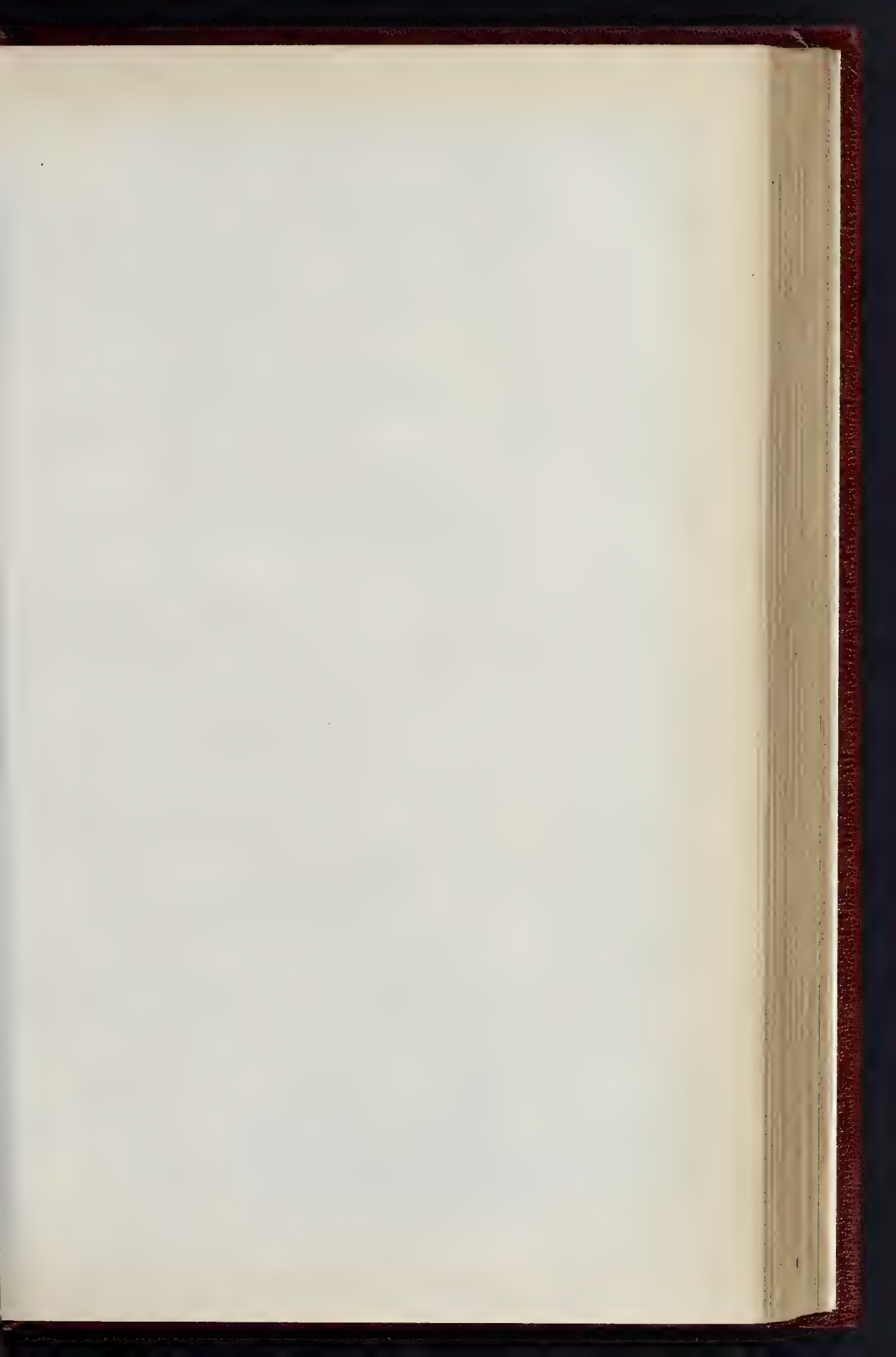
ENTRANCE TO THE NEW BUILDINGS OF THE GLASGOW INSTITUTE OF FINE ARTS.  
MR. JOHN JAS. BURNET, ARCHITECT.



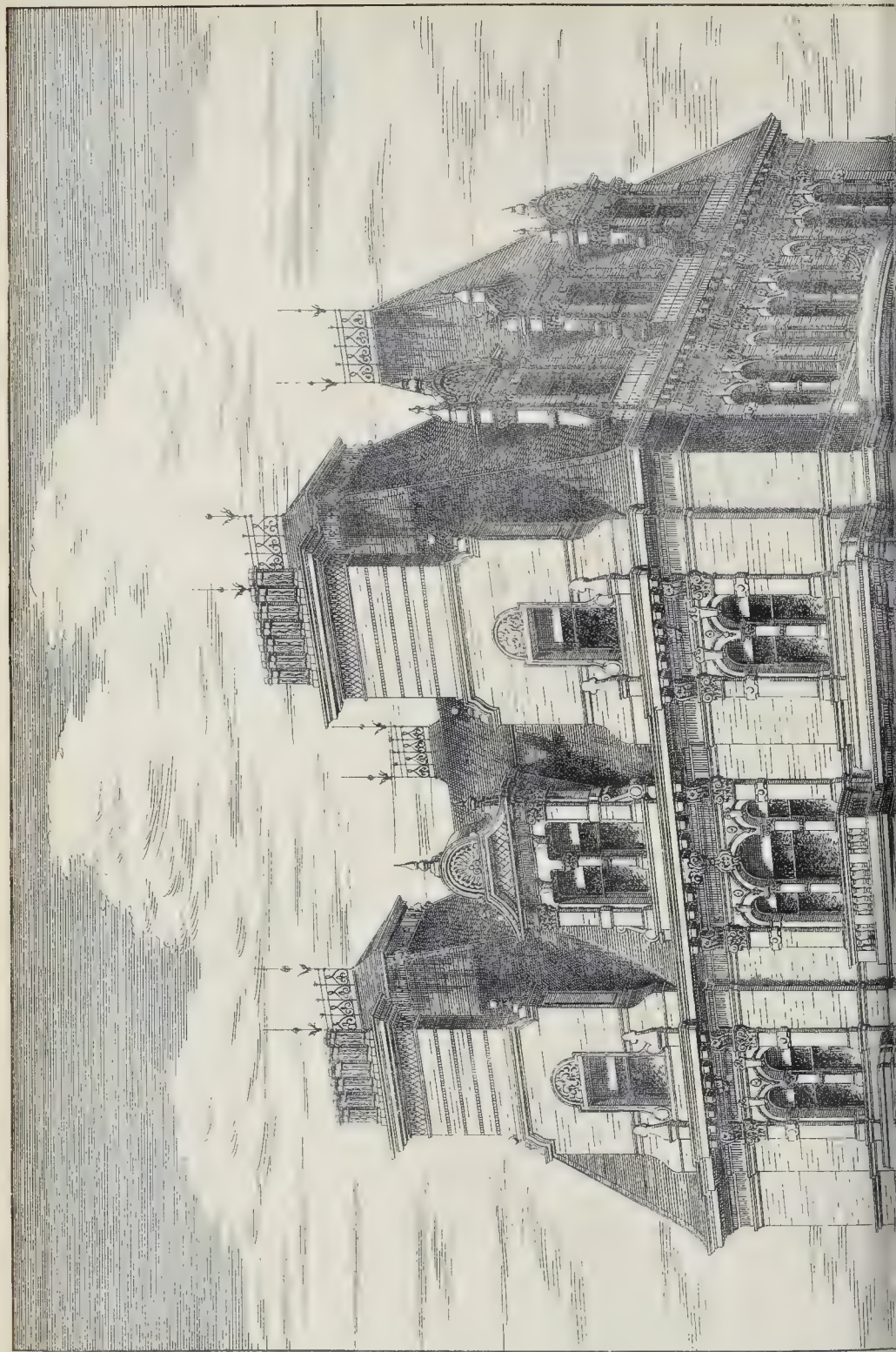




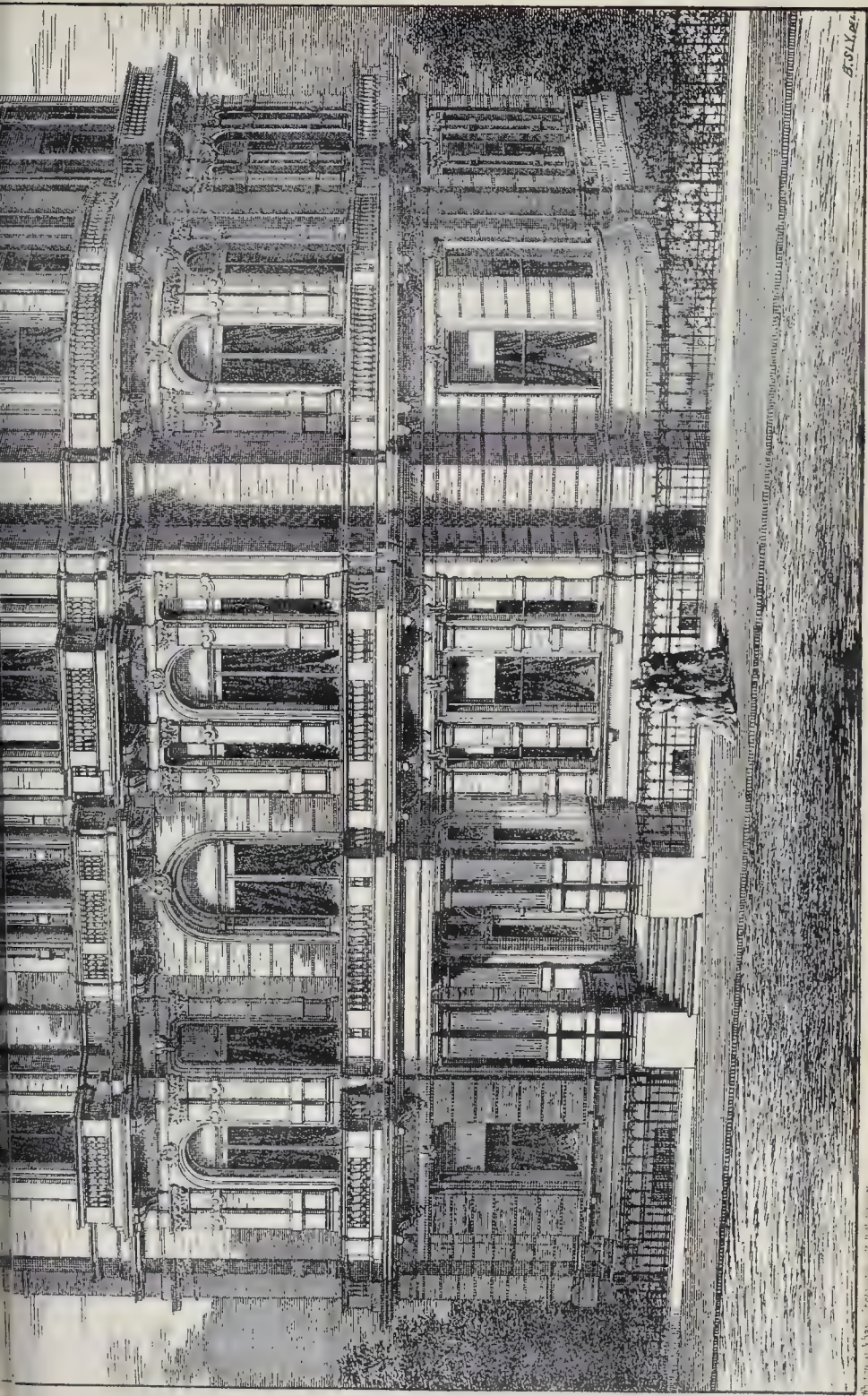




THE BUILDER, APRIL 22, 1892.







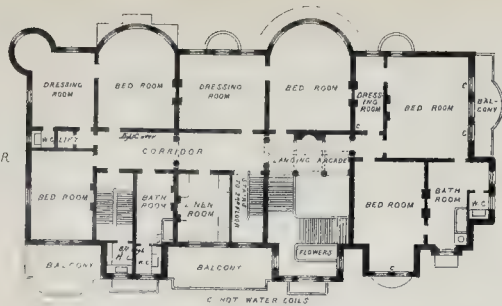
CORNWALL MANSION, NEAR QUEEN'S GATE, SOUTH KENSINGTON.

MR. J. T. SMITH, ARCHITECT

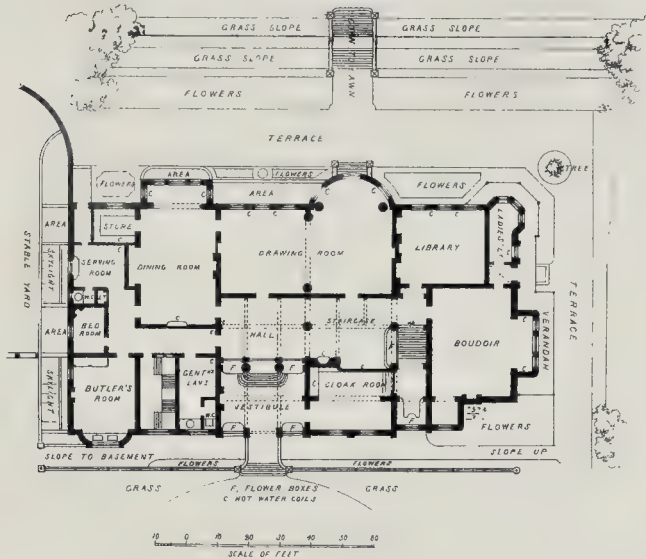




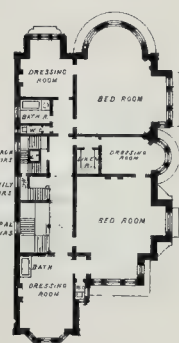
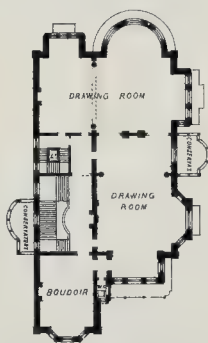
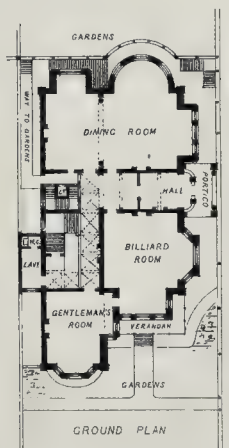
PLAN OF FIRST FLOOR



GROUND PLAN



PLANS OF BALHAM HOUSE



PLANS OF CORNWALL MANSION





HYDE PARK CORNER IMPROVEMENT  
SCHEME.

SIR,—The well-intended scheme of the First Commissioner of Works for relieving the pressure of traffic at Hyde Park-corner has been received with general expressions of satisfaction, which only serve to show how little the press and the public understand such matters in detail. It appears to be assumed, even by the Metropolitan Board of Works, who might be supposed to be better instructed, that the First Commissioner's scheme will do away with all inconvenience at Hyde Park-corner, and realise a public improvement in other respects in the formation of an ornamental place opposite to the entrance of Hyde Park, at the cost of pulling down and rebuilding the Wellington Arch and altering the line of Constitution-hill. The fact is, the First Commissioner's scheme, as you have already pointed out, will only partially relieve the obstruction of traffic, and that all that it will effect may be effected as well, or better, without touching the arch at all.

In the first place, let it be observed that the block of the traffic is as much or more felt at the foot of Hamilton-place as at Hyde Park-corner, from the collision of the traffic between the north and Victoria, with the Piccadilly traffic running east and west. This difficulty will hardly be touched by the plan put forth by the Office of Works; the stream of vehicles coming southwards from Hamilton-place will get away quicker when once clear of the corner, no doubt; but the traffic northwards from Victoria will be sent up to Hamilton-place quicker than it can get away, and the net result at that point will be much the same as at present. A road is no wider than its narrowest part,—a practical fact which seems to have escaped the notice of the draughtsmen of the Office of Works, who carefully figure a carriage-way "70 ft. wide" as a passage between two gateways only wide enough for one carriage to pass (vide plan), and who, therefore, apparently do not recognise that it is no use sending traffic up to a point by a road wider than that which it can get away by. Nothing would really clear away the obstruction at the foot of Hamilton-place but a roadway carrying the traffic under Piccadilly, a scheme which was, I believe, urged by correspondents in your columns at the time Hamilton-place was opened up, but the opportunity for which was lost, as such opportunities nearly always are lost at the time. The scheme could now only be carried out by purchasing the property on one side of Hamilton-place for the purpose, as the present roadway leaves no room for such an alteration; and though this would be an expensive process, still it might be supposed that as half a million was expended some years ago for the privilege of pulling down an old historic London building (Northumberland House) for the sake of an approach to the Embankment, a smaller sum might be reasonably laid out in purchasing the property to the east of Hamilton-place (which has no historic value) for the sake of a road which is far more necessary to public convenience than Northumberland-avenue. At all events, that is the only way to get rid of the obstruction, and of the consequent public inconvenience, for good and all; no scheme short of that will effect it.

This being the case, it would at the best be a question if it were worth while to take down and rebuild the arch for the sake of effecting what is only a half-measure; but a little examination of the levels of the roads which are to be manipulated will make it evident that all the advantage which the Office of Works plan does offer can be secured without moving the arch. I take the levels as given by the datum-figures of the Ordnance survey, which may be presumed to be correct. The bend of Constitution-hill next to the angle of Buckingham Palace-gardens, at the point A on the plan you are good enough to publish, is 3 ft. below the roadway of Piccadilly opposite the arch, and 14 ft. above the roadway of Grosvenor-place, opposite Halkin-street (B on plan). By raising Constitution-hill 3 ft. at this point (in other words, taking it level from Piccadilly to this point), and giving the new roadway as shown on my plan a slight dip of about 2 ft. from the crown of Grosvenor-place roadway, there would be ample height to take it under Constitution-hill, the

carriage-way of the latter road being carried on a bridge at A. The rise of the new road, as I have shown it, would be only 1 in 35; a very moderate gradient: the upper portion of Grosvenor-place, between Grosvenor-crescent and Piccadilly, is rather more than 1 in 30. My new road is the same width as Hamilton-place (it is of no use on earth to have it wider), and it crosses Piccadilly at right angles, instead of edging the traffic in obliquely through the Piccadilly traffic; thereby causing much less entanglement of the different streams of traffic, and rendering their regulation by the police much easier, than it would be on the Office of Works plan. The width of the carriage-way at the top of Grosvenor-place can be increased by taking away the footpath on the east of the roadway and providing an ascent for foot passengers on the east side of the arch, after passing under the Constitution-hill bridge; but even this is little wanted practically, for any one who watches the foot-traffic up Grosvenor-place will see that by far the greater part of it is confined to the west side.

It will be seen, therefore, that this plan provides everything that the Office of Works plan provides, without either disturbing the arch or cutting off part of Constitution-hill, and that the portion of land cut off from the Green Park is still left available for public recreation-ground. I have proposed that it should be made into a place or ornamental garden, of which the Wellington Statue, on a new and suitable pedestal, should form the centre; for any alteration of Hyde Park-corner ought to include the removal of the statue from a position in which it has been a mark for ridicule to every artist and architect, and many others besides, ever since it was put up. The First Commissioner's scheme includes not only removing and rebuilding the arch, but deliberately putting up again into its position the statue, a proceeding which will simply be regarded with derision by all people who are competent to judge of such matters, as Mr. Shaw-Lefevre will be pretty sure to find out if he carries out this part of his scheme. As to the way of laying out the intermediate space shown in the Office of Works plan, it would be superfluous to criticise in this respect a scheme which implies that an ornamental place, or anything worth the name, can be realised by cutting up a space of ground into three irregular shambles of mutton patches, too small to be made any use of, and without order or arrangement of any kind; and it may be charitably hoped that this part of the plan does not represent the taste or judgment of the present First Commissioner, but that of some irresponsible and permanent draughtsman of the Office of Works. If such a plan as this is really carried out, and if, when carried out and paid for, it is still regarded with all the approbation now hastily bestowed upon it, all that can be said is that the public are grateful in such matters for rather small mercies, acquired at somewhat disproportionate cost.

H. H. STATHAM.

THE PRESENT POSITION OF ART  
SCHOOLS.

AN Art Exhibition was opened at the Alexandra Hall, Newton Abbot, on the 12th inst. The Earl of Devon presided, and Mr. Calcott Horsley, R.A., delivered an address. Mr. Horsley spoke very strongly on the present condition and working of schools of art from South Kensington downwards. These art-schools, he said, had now drifted from the great purpose for which they were founded, namely, from schools of design in which art solely in connexion with manufactures was fostered, and had become mere drawing and painting schools for amateurs of both sexes, who flooded the country with worthless productions from which the country derived neither honour nor profit. He advocated a searching inquiry into the working of the Art Department of South Kensington, and urged the Government to institute such an inquiry before Mr. Gladstone and Sir Stafford Northcote, to whom he had previously made complimentary allusion, had passed from the scene of their earthly labours. He thought the great fault lay in the management of schools of art, from South Kensington downwards, by amateur committees, in which term he included the Privy Council, and the want of any efficient inspection of the staff of masters. Of his *Alma Mater*, the Royal Academy, the public were profoundly ignorant. He believed he should astonish even the Earl of Devon when

he said that for 130 years the Royal Academy had opened its doors to every one who came to enter, and had provided the most perfect artistic education possible absolutely gratuitous. They had there schools established for all that an artist need know, and they were worked by able keepers and professional curators; but above that, they had an institution by which, he believed, the vitality of the Academy had been preserved to this hour, and that was the list of visitors. These visitors were annually elected from the ranks of the Academicians, and the most eminent men were chosen visitors. Each gave up his time for one month to the work, and not only did they inspect the work of the Academy, but they taught in the schools. The work of the Academy was, therefore, practically known to them, and there could not be a movement in those schools which was not checked and known to the whole body of the Academy. And to that alone he attributed the fact that the schools were at the present moment in as brilliant a condition of vitality,—in fact, far greater,—as they were 130 years ago. It was that principle which he wished all to ponder over and to lay to heart, and to see how it could be adopted in schools of art and design everywhere. With all the goodwill and energy of amateur advisers and helpers, such schools would be infinitely helped by the aid of professional men, and he thought the system of visitors might be, at all events, partially adopted, and that such visitors should go periodically to the schools, and should be responsible for a searching investigation of their work and progress. The masters of such schools should be kept firmly to the principle that they must make the interest and work of the school "the first thing of their heart and hand." Their independent labour must, when possible, be kept subservient. They must also carefully guard against the habit of careless and perfunctory teaching. There was a great advantage in beginning art-studies when young. He himself began when he was twelve, and trundled his hoop to the academy where he was taught, and as a boy went through the same studies he saw bearded men going through now. He would have all students thoroughly understand that at whatever age they commenced there could be no hope of future progress unless by untiring industry in mastering elementary instruction. Having said this much to masters and students, he would make a few remarks on the exhibition now around them. Judging was a hard and heart-breaking task, because the conscientious adjudicator was haunted by the faces and feelings of disappointed competitors. The judges had been greatly aided by the energetic action of their excellent friend the hon. sec. (Mr. Phillips), and by Mr. Vicary and his assistants. There were two points upon which they might be congratulated. Considering that the Newton School had only been in existence two years, their performance generally was decidedly satisfactory. He was especially gratified at the quality of the freehand drawings and mechanical outlines,—the foundation of all that followed. It would be difficult to name a school that had a more demonstrable reason for its existence, for the Newton School had intimate associations with the old-established pottery industry of the district, and might be venture to prophesy that that association would lead to great national results? But to enable him to be a true prophet they must one and all wake up to the difficulties as well as to the importance of the task before them. However, it inspired even a stranger like himself with enthusiasm, and he was sure they had not asked him down there to prophesy merely smooth things. The judges could only look upon the pottery exhibits there as a kind of germ of good things to come, and it sometimes required hard looking even to find and to see that germ. After that exhibition he hoped they would settle down to that hard work and study which could alone lead to success. They would receive priceless aid through the liberality of Sir Samuel Baker, who had formed a splendid collection, which he now permitted them to study, and he (Mr. Horsley) implored his dear young friends who had wasted precious hours in daubing on plates and scribbling upon pots to go down on their knees in spirit before the work of these Japanese artists. Let them devote every moment of their spare time to the minute study of the great works now before them. As the last part of his address Mr. Horsley dealt with the art education of women. He uttered a warning voice as to the modes of study for women which had been encouraged of late



years, which he considered reprehensible from a moral and religious point of view, and utterly useless from an artistic point of view. Such practices, too, as now prevailed in England were utterly unknown in Government art schools abroad. In the courageous struggle which many women of this country maintained to get what they were pleased to term their rights, there was much to sympathise with. He had every admiration for the way in which, by zealous industry, thousands of women, abjuring liasses and purposeless lives, now acquired knowledge and practical skill in various schools. But the profound mistake they too often made in their profound enthusiasm was in demanding to be admitted to the same intellectual platform as man, and to have all their privilege of work and study. Women, we know, were sent into the world to fulfil some of its highest and noblest purposes; but we were equally certain they were not sent to write great epic poems, to compose great oratorios, or to paint great historic pictures, and every effort on the part of women to deal with these must end, as they ever had done, in disastrous failure. Distinguished female artists were not to be found out of the category of unis. They were the exceptions which proved the rule. Therefore, women should not be encouraged in studies more than questionable from a moral point of view, and from which they could derive no real artistic benefit. Abroad, they ever recognised the fact that real artistic effect was alone achieved by man. But whilst uttering these plain, and, he feared to some of his fair audience, unpalatable truths, let it not be imagined that he would ignore or fail to encourage much that was delightful in the art gifts of women. A real hard-and-fast line as to how far they should go need not be set up; it was already drawn for them, inasmuch as they were women and not men, and with regard to drawing from naked living models of both sexes in Government Art Schools, so far as women and mixed classes were concerned, he called upon all of them to put down such practices as being shockingly repugnant to feelings of Christian morality, and utterly useless in their artistic results. He (Mr. Horsley) said this under a deep sense of duty, as the time had more than arrived when the question should be brought under the influence of public opinion. He believed this pernicious practice was commenced at the Slade School, and from their practice spread to South Kensington, and he was afraid to other schools. For the fuller understanding of all the evils arising from this pernicious system, it would be necessary to enter into details; but he willingly passed from it. It was the duty of every Christian citizen to do his utmost to discourage and put an end to so shameful a practice. He contrasted the practice of foreign Government schools. In Paris they only were permitted to study from the nude living model who were of sufficient age to show decided talent, and who were recognised as professional art-students. And he was assured that what was permitted at the Slade School would be impossible in any part of Germany. In all foreign countries studying from the living model was left more to private responsibility. The council of the Royal Academy had always peremptorily refused naked models to the female artist. She should alone deal with the clothed figure, which was indeed more in accord with the spirit of Christianity. This pernicious practice of which he had spoken was ultimately associated with that great wave of infidelity which Lord Shaftesbury had observed was passing over our land, and such practices he (Mr. Horsley) said were mainly advocated and permitted by those who, under the polite and society guise of "Agnosticism," would veil their atheism. All the reverence and modesty of Christian life were bound up with clothedness, and all art representations of nakedness were out of harmony with it. He instance the erstwhile demoniac who was found sitting at the feet of Jesus, "clothed," and in his right mind.

**New Swimming and Private Baths,** in the rural district of Richmond, Surrey, will be opened on Saturday next, the 22nd inst., by his Serene Highness the Duke of Teck. The architects are Messrs. G. Elkington & Sons, Cannon-street; the builder is Mr. Priestley, of Kennington-road. The whole of the engineering work has been carried out by Messrs. Thos. Bradford & Co., of London and Manchester, who have also supplied the laundry machinery.

#### THE DESTRUCTION OF AN EXHIBITION BY FIRE.

ONE of the most extraordinary acts of Vandalism known in modern times was perpetrated a few weeks ago at Porto Alegre, a town in the southern part of Brazil. In the last quarter of 1881 an Exhibition was opened in the place in question, the contents being partly Brazilian, but mostly German. The German population in that quarter is numerous and influential, and the Exhibition was got up by a German firm of Porto Alegre, in conjunction with a Berlin society, who induced many German firms to send samples of their goods to the Exhibition. The name of this society is the Berlin Association for Commercial Geography. Its objects are to promote German foreign trade and German colonisation. The Exhibition was got together and opened under very favourable auspices. It remained open several months, and 15 contos were received in admission-money. Unfortunately, two days after the close, the whole building, with all its varied contents, was totally destroyed by fire. Worst of all, the fire was due to a wanton series of acts of incendiarism on the part of a drunken mob. In addition to the admission-fees, the rents of stands, and a grant from the Provincial Government of Sao Pedro do Sul, the expenses of the enterprise were to be defrayed in part by a lottery. This last-mentioned source of revenue played an unexpectedly important part in the final catastrophe. The reason assigned for the populace setting fire to the building is their indignation at the paltry value of the prizes given to the winners in the last series of drawings in the lottery. The first explosion of the popular dissatisfaction took place the day before the Exhibition was burnt down. Koots of men assembled in the refreshment establishment connected with the show, and manifested their dissatisfaction with the affair by helping themselves to liquor without payment, by smashing the windows, and by pouring spirits on the curtains and setting fire to them. Nothing more serious, however, occurred until the following day, when the mob re-assembled and resumed the same conduct as on the first day. The officials and attendants managed, however, to ward off any danger of fire, although the curtains were again soaked with alcohol, and set fire to. At about half-past five in the evening the mob turned its attention to the packing-court, which at the time was filled with wooden boxes and cases, and hay and straw. These were close to a number of sheds used as stables, and the sheds adjoined the Exhibition Building itself. It occurred to some of the rioters to set fire to the straw in this department. Even after this had been done, it was some time before the flames assumed any serious proportions. Throughout the proceedings the authorities—the soldiers and the police,—rendered no assistance in checking the excesses of the mob, or in preventing the spread of the fire: all that was done in this way being effected by the officials and the servants. A member of the committee addressed the crowd, and endeavoured to persuade it to disperse without doing any further mischief. In this he seemed likely to succeed, but some person crying out that his hearers were "a disgraceful drunken rabble," the crowd refused to listen any longer, and the riot was resumed.

From this moment the fate of the Exhibition building and the whole of its varied and valuable contents was sealed. After the failure of the attempt to pacify the mob with words, and while the fire was beginning to gather force in the packing-court, the rioters again poured spirit on some of the curtains and set fire to them, and began to throw stones enveloped in lighted paper through the broken windows into the Exhibition building. It was not by these attempts, however, that the ultimate catastrophe was brought about; but, as already described, by the rapid spread of the flames from the packing-court and sheds. After one of the towers of the Exhibition had been caught by the flames the progress of the conflagration was terribly rapid. In the course of half an hour the whole of the building and its contents were consumed. The fire was a terrible spectacle, and was witnessed by an immense crowd of citizens. The difficulty which this act of Vandalism has left behind is a serious one. The goods and building were insured, but no insurance company is likely to pay if the statements of the German settlers in Porto Alegre are correct. The *Deutsche Zeitung*, published in that town, throws the whole blame on the shoulders of the police and

local authorities. After the first day's tumult it is stated that the chief officials connected with the Exhibition had applied to the provincial authorities for a sufficient force of police and soldiers to protect the property; but their representations remained unheeded. Moreover, the few police who were on the spot at the time of the renewal of the disturbances on the second day are said to have remained almost passive spectators of the excesses of the mob. They made no exertions to restrain the rioters or to put out the fire, all that was done in that way being the work of the officials, attendants, and waiters connected with the Exhibition. "The Government," says the journal just mentioned, "was informed, through its agents, beforehand of the danger that threatened, but it did nothing towards warding it off. The Government, therefore, must be held responsible for the damages. There may have been failings in several quarters, but the duty of preserving public order is not the business of private persons, but of the State. Disturbances had taken place on Wednesday, although, in spite of the police putting in a very late appearance, they did not lead to serious consequences, but every one knew the tumult would be renewed on the following day. Even at nine o'clock in the morning more windows were smashed. When, therefore, the crowd increased in the afternoon and recommenced its work of destruction and plunder, was it not the duty of the police to interpose with energy, and even eventually to demand the assistance of the military? Instead of this, the *gendarmes* not only tolerated the scandal, but even encouraged it. One who was present reports that he heard a soldier saying to one of the rioters, 'Go ahead! Our orders are not to interfere with the people! And so, in the presence of the soldiers, windows were smashed; stones were thrown at porcelain wares and lamps; and everything drinkable was fetched out and drunk, the soldiers joining quite cordially in the carousal. This is surely a perfectly intolerable state of things. The mob treated the entire affair as an excellent joke, and the authorities did not interfere with them. It is now proved that the Commissioners on the fatal day, Thursday, Feb. 23rd, asked every where for the assistance of the military. They asked the President of the Province; they asked the police; but all in vain. More the Commissioners could not do. The authorities are, therefore, responsible for the losses suffered. The exhibitors will require compensation, and the entire sum may amount to hundreds of contos, perhaps 40,000*l.* or 50,000*l.*" "This outrage," continues the writer, "is moreover an insult to all the Germans here living. This alone will be reason enough for the German Government not to remain a passive spectator in the matter. Complications of all sorts may be the consequence." We hope, however, that the affair will be treated with calmness and good sense, and that no further trouble may arise out of it.

#### INTERNATIONAL EXHIBITION OF HERALDRY.

THIS Exhibition was opened at the commencement of the present month, in the Art Exhibition Palace at Berlin, by Count Skillfried, Alcantara; Prince Charles of Prussia, the patron of the enterprise, being prevented from being present by indisposition. Count Skillfried, in a brief inaugural address, pointed out the importance of the different branches of study included in this exhibition, which presented not simply objects of heraldry, but was rich in articles belonging to the department of Sphragistics and documents bearing on genealogy. Heraldry, Sphragistics, and Genealogy were, in fact, three not unimportant auxiliary sciences to history. The speaker was glad to assure his audience that these sciences, and the present exhibition of objects connected with them, had called forth a large amount of interest, not only in Germany, but in most other European countries. After Count Skillfried had declared the exhibition open, the assembly proceeded to take a first promenade through its different departments. One of these is the "Hohenzollern Chamber," containing numerous interesting objects representing the arms and seals of the House of Hohenzollern, the reigning family of Prussia and Germany. Other departments were those of Antiquities, arranged by Herr Döpler, jun.; the Genealogical collection, by Herr Badczies; the Orders and Coins, by Major Strantz; the Glass and Porcelain, by Count von



Brühl, the Engravings, by Herr Otto; the Armoury, a rich collection of weapons, by Captain Kretschmar; the Textile Fabrics and Tapestry, by Professor Hildebrandt; and lastly, the treasures of the Dresden Museum of Art Industry, by Captain Kretschmar. The select and distinguished company, among whom were several Ministers, were conducted through the various departments by their respective chiefs, who explained to the guests the most interesting objects and features of the different groups. The exhibition presents a splendid spectacle, and is a great success. The Ministers and other distinguished personages present at the opening unanimously expressed the great surprise and pleasure with which they had witnessed this unique and extraordinary display.

#### INTERNATIONAL COMMISSIONS FOR ELECTRICAL OBSERVATIONS.

At the congress of Electricians at Paris last year, three International Commissions were suggested in connexion with electrical observations and other objects. In accordance with this suggestion the French Minister of Foreign Affairs addressed to the French representatives abroad a circular inviting the co-operation of all the chief States of the world. The following Governments have accordingly appointed delegates to the three Commissions in question:—England, Belgium, Holland, Switzerland, Italy, Spain, Austria, Hungary, Norway, United States, Mexico, Costa Rica, Nicaragua, Columbia, and the Argentine Republic. Germany, Russia, and Portugal have also accepted the invitation, but have not yet appointed their delegates. Sweden and Brazil have not yet accepted, and an answer has yet to be received from Turkey and Japan. The Commissions were to have met in Paris on the 1st of April, but owing to the delay in the appointment of some of the delegates the convocation of the Commissions has been postponed for a short time.

#### RUSSIAN NEWS.

An interesting question has recently been occupying the attention of the Russian Technical Society. This is the illumination of churches by the electric light. The primitive methods of wax candles and oil lamps is by many considered unsatisfactory when the brilliant illumination of electricity may be had so easily. A trial of lighting the new Cathedral of St. Saviour, in Moscow, was recently made with 8,000 wax lights, and the result proved unsatisfactory.

This question of the introduction of the electric light into churches will be considered by a meeting of members of the Russian Technical Society during the Moscow Exhibition, and it is contemplated subsequently to bring the matter under the notice of the higher ecclesiastical authorities, who, it is thought, will not come to any final decision without reference to the other autonomous Greek Orthodox churches.

It is extremely doubtful that the Russian clergy will accept the new light. Apart from the conservatism peculiar in ecclesiastical matters, the Church rules are very strict in prescribing wax and oil as the sole sources of illumination in the temples of the Greek faith. To this day gas is permitted in no Russian church. The Russian churches are, as compared with those of Western Europe, small, and the congregation never use books. There seems to me no need of this innovation, which by many will undoubtedly be deemed revolutionary. Artistically, I believe, one very characteristic feature would be quite lost,—the mellow, golden effect of the richly-gilded iconostasis, and the groups of lighted candles which it reflects.

Arrangements are being made for public lectures to be given in connexion with the forthcoming exhibition of Russian Arts and Industries at Moscow. Several courses of lectures upon technology and mechanics are in preparation, under the auspices of the Society for the Diffusion of Technical Knowledge.

There is to be a fresh competition for the design for a church to be erected upon the spot where the late Emperor of Russia was assassinated.—The Temple of the 1st (our 13th) of March, as it has got to be called. In this competition no prize is to be given,—none, at least, has been named as yet. All drawings, however, will be submitted to the Emperor if, upon examination, they are found to fulfil the following conditions which have been decided upon. The

church is to have three altars, it is to be of sufficient size to accommodate 1,000 persons, and it is to be in the Russian ecclesiastical style of the sixteenth century. The ground-plan is to be so located that the spot upon which Alexander II. fell mortally wounded should be within the church, and at the right-hand corner of its western end. The society is not to be placed beneath the church, as this part must be reserved exclusively for heating apparatus. The drawings are to be made upon the following scale:—For façades and section half an inch to the sazhen (= 7 ft. English), for plans one-quarter inch, and for the general plan one-fifth inch to the sazhen.

According to the *Novosti*, a permanent exhibition for trades and industries connected with building is to be established in St. Petersburg, with the co-operation of the Society of Architects. The committee chosen to decide upon the merits of the various competitors will, it is added, soon have completed its work.

An architect of Warsaw has designed a handsome opera-house for the city. The plans and drawings are now under consideration by the authorities at St. Petersburg.

#### THE NEW CITY OF LONDON SCHOOL. VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a large number of the members of the Architectural Association paid a visit to the new City of London School, on the Victoria Embankment. The buildings are now approaching completion, and will probably be opened some time in the autumn. The visitors were very kindly received by Mr. Davis, of the firm of Davis & Emanuel, the architects whose design was selected in the competition which took place more than two years ago. That design, however, is not that which is being carried out, for the Corporation of London having reduced the frontage towards the Embankment from 195 ft. to 132 ft., the plans had to be entirely recast. Of the design as it is being carried out we gave a view and four plans in vol. xxviii. of the *Builder*, pp. 692-5 (May 15, 1880), therefore it is not now necessary for us to describe the buildings in very minute detail. The total area of the site is 70,000 sq. ft., and the main buildings occupy an area of 18,000 ft. In addition, there are a large gymnasium, six "Fives" courts (two covered and four open), and detached latrines, &c., covering in all an additional 5,200 ft. From the basement three staircases lead up (on the west side of the building) to the second-floor level. These staircases will be mainly for the use of the scholars, and, although giving access to all the floors of the building, will, as a matter of discipline, be separately assigned to the boys having their class-rooms on the ground, first, and second floors respectively. By these staircases the boys will reach the basement, which contains a large covered playground, and which is level with the open playground north of the buildings. In the basement is a large dining-hall for the boys, 50 ft. by 32 ft., and 16 ft. high (which is the height of the basement story throughout, and of all the other stories of the building, excepting only the great hall and the lecture theatre). This dining-hall will be in communication with the kitchen (which is on the second floor) by means of a lift. It is thought that some 200 out of the 600 scholars for whom the school is being built will dine on the premises. (It should be remembered that the school is a day-school.) Adjoining the dining-hall will be lavatories for the boys, and a commodious hat and cloak-room, properly ventilated and warmed. This room will measure 48 ft. by 36 ft., and will have eight entrances. South of the dining-hall will be a room 34 ft. by 32 ft., for the boilers and heating apparatus. The heating arrangements have been entrusted to Mr. Herring, of Chertsey. Boyd's hygienic warm-air ventilating grates will be used in the class-rooms. The whole of the building will be lighted by gas. This part of the work is in the hands of Messrs. Clarke & Co., of Moorgate-street. The electric bells and speaking-tubes will be fitted up by Mr. Wontner Smith, of Finsbury-pavement. The whole of the walls in the basement story are faced with Cliff's cream-coloured glazed bricks. The floor of the covered and uncovered playground will be covered with tar-paving. The corridors on the upper floors will be paved with Claridge's asphalt, and the walls will be lined with Martin's white glazed tiles. The floors throughout are

constructed of iron and concrete, that of the great hall being covered with wainscot oak and walnut, and those of the class-rooms and other apartments with pitch-pine. On the ground-floor, which will be raised some few feet above the Embankment roadway, access will be gained by the steps leading up to the principal entrance to a vestibule, nearly square, 34 ft. by 32 ft. This vestibule and the grand staircase leading up to the great hall (the floor of which is on the same level as the first floor of the teaching block in the rear) will form a very fine feature of the interior. On the staircase a niche is provided for a statue of the founder of the school, John Carpenter. Right and left, or east and west, of the vestibule will be corridors giving access to the rooms of the head-master, secretary, clerks, to the library, and to the class-room over which the head-master will preside. Running northward of the vestibule will be a corridor traversing the centre of the "teaching-block," on to which, on the ground-floor, eight class-rooms, each about 24 ft. by 22 ft., and each intended for forty boys, will open. At the north-east corner of the teaching-block, on the ground-floor, will be a suite of sitting-rooms, lavatories, and retiring-rooms for the assistant-masters. The great hall, on the first-floor level, runs east and west along the whole length of the façade towards the Embankment, and is 100 ft. long by 45 ft. wide in the clear. It forms the top story of this part of the building, and is covered by a high-pitched roof relieved with dormers and surmounted by a *flèche* in the centre. The height of the hall from the floor to the springing of the roof is 40 ft. The roof will be ceiled at a point 24 ft. above the springing, the timbers below the ceiling being caled and made to carry between them two tiers of arches supported on columns,—it being, in fact, an attempt to treat an open-timbered roof in a Classic manner. The total height of the roof from the floor of the hall to the ridge will be 84 ft. The first-floor of the "teaching-block" is similar in arrangement to the ground-floor, having a central corridor with class-rooms on either side; while on the second floor will be the kitchen and scullery, chemistry class-room and laboratory, apparatus-room, drawing class-rooms, apartments for the head, and, in the rear, the lecture-hall, 58 ft. by 48 ft. The roof of the great hall will be covered with green Westmoreland slates. Portland stone is used for the façade. The carving of the smaller details is by Mr. Seale, of Walworth, while Mr. Dayman is doing the larger sculptural work for the adornment of the exterior. The style of the building is Italian Renaissance. Mr. Charles Till is the clerk of works, and the visitors to the building on Saturday last had to thank him for the assistance he rendered to Mr. Davis in giving them information about the works, which are being carried out by Messrs. John Mowlem & Co., the amount of their contract being for 76,000l. Mr. John Jackson is the general foreman.

#### THE GROWTH OF ERRORS.

In our number for February 11th last, under the heading, "A Great Pre-historic Find," after alluding to Bologna as offering remains astounding to the archaeologist, we went on to say, "It was not long since that in the excavations necessary for laying down a drain in the centre of the city, near the Church of San Francesco, perhaps one of the largest 'finds' of pre-historic treasures ever made was unearthed," and of these treasures we then gave an account. In the *Globe* of April the 10th appeared an article headed "Extraordinary 'Find' of Pre-historic Remains," commencing with the even more extraordinary statement:—"In the excavations necessary for laying down a drain in the centre of the city of San Francisco, near the church, the Antiquary says perhaps one of the largest 'finds' of pre-historic bronzes ever made was unearthed," and then going on to repeat the particulars we had given. Referring to the *Antiquary* of April, we found, sure enough, that our esteemed and learned contemporary had actually fallen into the strange error in question. The writer was probably flurried by the notion that he was making use of other people's goods without acknowledgment, and did not think of what he was doing. Now that the mistake has been again set going by the *Globe*, it will be taken up by other public teachers, and will be found cropping up again years hence to the amazement of the well-informed.



## THE NEW CONSERVATIVE CLUB AT LIVERPOOL.

The site to be covered by this building, of which the corner-stone was laid by Lord Salisbury last week, is (according to the *Liverpool Post*) about 1,100 yards in area, and has frontages of 96 ft. to Dale-street, 102 ft. 9 in. to Sir Thomas's-buildings, and 107 ft. to Cumberland-street. The style adopted is Renaissance, of a French type. The fronts towards Dale-street, Sir Thomas's-buildings, as well as the returned end in Cumberland-street, are built with Stourton stone, with outlooks from the principal apartments of the club proper. The continuation of Cumberland-street front is in Cliff's white bricks, red brick arches, and stone dressings, iron mullions and heads, to ground-floor and basement. The latter story is built in massive rusticated courses. The ground-floor story is taken up by the grand entrance-hall, reception-room, morning-room, library, and writing-room. A speaker's balcony is so constructed as to be accessible from the morning-room, and from it addresses can be delivered as occasion requires. The first floor is composed of a complete Corinthian order of polished stone. The principal windows are semicircular, and the spandrels of the architrave are emphasised by sculpture in relief, representing twelve subjects of the arts and sciences as follows:—Architecture and Engineering, Sculpture and Painting, Masonry and Carpentry, Navigation and Commerce, Agriculture and Manufacture, and Astronomy and Chemistry. A spectator's balcony is constructed in recesses of two fronts, 5 ft. 6 in. wide, supported on massive projecting consoles, boldly carved in relief. The second floor, which is a repetition of the order below, is occupied by two spacious private dining-rooms, three billiard-rooms, and two card-rooms; whilst the attic chiefly consists of extensive dormitories (separated alternately by the steward's and house-keeper's apartments), servants' hall, kitchen, and accessories. The fronts of the building are relieved by carved panels in window dados, key-stones, spandrels, festoons, and capitals to columns. The large angular towers will be covered with ornamental fish-tiles, and a flag-staff, 40 ft. high, will be on the central tower.

The grand entrance to the club proper is situated at the corner of Dale and Cumberland streets (nearest to the town-hall), and is approached by a flight of marble steps, on either side being lamp-pedestals, Peterhead granite pilasters, jambs and richly-carved counter-jambs, and carved capitals, surmounted by massive consoles and bold entablature and pediment, having the arms of the city and county, also the constitutional motto, carved in deep relief. On either side of the vestibule are flower-stands, enclosed by ornamental oak and plate-glass screens. The vestibule folding-doors lead to the grand entrance-hall, which is subdivided into upper and lower vestibules by marble columns, and the floor is in marble mosaic.

There is a commodious committee-room in close proximity to the staircase-hall. By a series of marble steps the grand staircase is reached, presenting a complete Tuscan order, with a deep walnut dado between pilasters, continued all round up the staircase and along the landings. The floor of the landing has a deep margin of parquet work, alabaster, and Italian marble. The lighting of the second floor is obtained by three large windows from the central area; also counter-ceiling-light, moulded bars, and all filled in with stained glass. On the ground-floor there are the entrances to the library and morning-room. The morning-room, which occupies two flanks of Dale-street and Sir Thomas's-buildings (equal to an area of 60 ft. by 25 ft.), exclusive of two bays having panelled walls, deep walnut and Parian dado, divided by columns and pilasters. The height of this floor is 17 ft. The coffee-room has three bays, and in capacity represents about 100 ft. by 28 ft. 9 in. The height is 18 ft. 6 in. The room is pleasingly broken into sections by single Corinthian columns, pilasters, with entablature and suitable cornice, deep walnut and cement dado (the latter for decorations). The smoke-room is similarly treated to the coffee-room, except the ceiling, which will be deeply coved and intersected by geometrical ribs. The apartment has a large bay, and is lighted from Dale and Cumberland streets. On the second floor are three spacious billiard-rooms, having four tables, two card-rooms, and two private dining-rooms. The kitchen is 50 ft. long and 17 ft. in

height. Over the scullery are the laundry and washing accommodation, provided with necessary machines and apparatus, arranged to be driven by steam or hand power, as may be required. The heating, in addition to fireplaces, is obtained by hot-water pipes and coils, executed by Messrs. Bennett & Son, of Liverpool. The cold air is drawn in by means of a large tunnel under the meeting-hall of the basement. Fresh air is also admitted by "Tobin's" ventilators. The vitiated air is to be drawn into air-tight troughs and chambers under the roofs, and extracted by means of the "Aome" air-pump, worked by a silent gas-engine, supplied by Mr. Baker, of Liverpool. The contract (amounting to about 33,000*l.*) has been taken by Mr. Thomas Urmsan, of Liverpool; and the architects are Messrs. F. & Geo. Holme, of Liverpool. The clerk of the works is Mr. Joseph Varty.

## THE NEW TOWN-HALL AT BOOTLE.

This building was formally opened on the 10th inst. The principal front is in Oriol-road, and looks towards the busy docks and the river Mersey. On the north the building has a frontage to Trinity-road, both that and Oriol-road being broad and commodious thoroughfares, though out of the line of the heavier traffic which passes through the borough. On the south and east of the building there is a large open space, extending from Balliol-road to Trinity-road, and on these sides there is ample room for any extension which may hereafter be required. The great hall occupies the angle at the corner of Oriol-road and Trinity-road, having the Mayor's parlour, committee-room, and council-chamber on the right, fronting Oriol-road, while the offices of the corporation officials are to the left, fronting Trinity-road. The architect is Mr. John Johnson, of London, whose design was selected from among those sent in by fifty competitors. The style adopted is the Renaissance of the period of Francis I., but omitting the exuberant details usually employed. On the Oriol-road frontage, the lofty gable of the great hall, the portico which forms the principal entrance to the building, the clock tower, and the embayed windows of the committee-rooms, form the most striking features of the elevation. A line of panels, each carved with some armorial device, is carried round both the Oriol-road and Trinity-road frontage, midway between the lower and upper windows. The principal features of the elevation fronting Trinity-road are the six windows on that side of the great hall, and the arch, with pilasters and pediment at the entrance, which gives access to the public offices. The exterior walling is of Yorkshire porpoins, with yellow Stourton stone dressings for the architectural features. The entrance to the public offices is in Trinity-road, and immediately on entering there is a large well-lighted hall and corridor, giving access to the Town-clerk's private and public offices, placed near to the Mayor's apartments facing Oriol-road. The Mayor's parlour, ante and committee-rooms, council-chamber, &c., are entered from Oriol-road, the principal entrance being emphasised by the clock-tower. The large entrance-hall is connected by swing-doors with the entrance-hall to public offices, so that on crowded occasions the two entrance-halls can be thrown together. The first floor is approached by the grand stairs, 8 ft. wide, terminating in a spacious landing. The large hall or building has an area of upwards of 4,000 superficial feet, with large platform at one end, and retiring-rooms. For the convenience of the front or reserved seats, a separate carriage-entrance and staircase are provided. At the sides of the hall are projecting balconies supported on cast-iron cantilevers to avoid obstructing columns on the floor. There is a large end gallery. At the west end there is a large window filled with painted glass. The decoration of the hall is deferred for a short time. The builder is Mr. S. Webster, Brazenose-road, Bootle. Mr. James Paul has been the clerk of the works.

**Fruit.**—The *Gardener's Magazine* reports that fruit-trees are making a capital promise, and that garden-crops in general are in a satisfactory state. Severe frost now would undoubtedly prove terribly destructive, and our contemporary says that we must not consider that we are safe until after May 25th. Potatoes are unusually forward, and fruit-trees are flowering freely south of the Trent.

## ST. PETER'S, LITTLE OAKLEY, NORTHANTS.

THIS interesting church, now in the hands of the Duke of Buccleuch, through the ancient Montagu family (who held the Great Boughton estates in Medieval days), has been completely restored. The work was contemplated by his Grace more than twenty years ago, but more pressing claims prevented anything being done until 1867, when it was determined to carry out such structural work as was then absolutely necessary.

The church has a nave and aisles, with arcades of three arches, chancel, and west tower. The body is Early English, the aisles and clerestory very Early Decorated, and the lower Perpendicular. The nave and chancel roofs required to be entirely renewed in oak, the former high pitch of the latter being returned to.

The ancient poppyhead seats were repaired and new ones added, and a triplet window took the place of a modern square window in the east wall of the chancel.

Recently the ancient roofs of the aisles have been repaired and renewed, and the destroyed parapets restored.

The porch has been rebuilt, a vestry added, and proper tile floors and choir seats, &c., placed in the chancel, with a general repair of all the defective masonry.

The ancient platform in front of the former screen remains, as also a large portion of the altar of the north aisle, together with the stairs to the rood-loft, and also a relic of Paritan days, the old projecting wooden support for the hour-glass close to the pulpit.

There are two rich tombs of the old Montagu family in the chancel, and a Medieval effigy, probably of one of this family, in the north chantry.

The more recent works have been carried out by Mr. S. Foster, of Kempston, under Messrs. K. Herbert Carpenter and B. Ingelow, of London. Mr. Owen Thomas was the carver employed.

Close to the church is the fine old Manor House of the Montagu family, built early in the sixteenth century.

## "PISTOJA AND ITS MONUMENTS."

We have recently received from Italy a copy of the local journal of Pistoja, — *Il Popolo Pistoiese*, — containing a lengthy notice (in great part a reproduction) of two papers published not long since in these columns on the monuments of that interesting Tuscan town.\* Our Italian contemporary especially draws the attention of its readers to this notice by a foreign critic, of the treasures of the city, with a view, not alone, as the author, Sig. Chiappelli remarks, of making known to his fellow-citizens what opinion is held of their city and its antique edifices, so long the admiration of every cultivated traveller, but also on the score of the "curious, but none the less painful, truth" that he finds among his fellow-citizens an absence of proper knowledge of, or a legitimate sentiment and pride in, the artistic glories of their city. It is gratifying to be thanked "publicly" by our Pistojan correspondent for our papers on his city, and particularly when our agreeable task is acknowledged in such words as those with which Signor Chiappelli concludes his notice. "May our English contemporary, by calling the attention of the Pistoiesi to the treasures which are contained within their walls, contribute to revive among us the respect and worship of our national art, and the desire to ensure the prompt and suitable maintenance of our monuments." We can, however, scarcely believe Signor Chiappelli's statement that, on mentioning to those about him that a foreign journal had noticed at some length the monuments of Pistoja, he met with an expression of wonder that the city could supply any matter for artistic inquiry. "So little are we affected" (remarks the author in these, his "painful preliminaries," as he terms them) "by the artistic movement and the warm interest felt in the great works of the past, which is to be noticed at Florence, at Siena, at Lucca, at Arezzo, and throughout Tuscany." This feeling of indifference referred to by our contemporary, it must be confessed, is to be noted in Italy; yet somehow we suspect a knowledge of the artistic glories of their past is more largely spread among the masses in the

\* See *Builder*, p. 5, ante; and vol. xii., p. 730.



peninsula than it is with us. We are afraid, however, that the interest, where the all-seeing *forestiero* appears, is soon corrupted by mercenary considerations; and is not this so all the world over?

Our Pistoian critic, we are pleased to see, reproduces almost in its entirety our notice of the monuments of his city, only gently hinting in his conclusion at the omission of mention of certain features worthy of notice. These our courteous critic sums up as follows. The silver altar of S. Atto in the Duomo, "a marvellous work, in which is comprised almost the entire history of three centuries of the Tuscan goldsmith's craft, and superbly set in its surroundings by the skill of Brunelleschi"; "the elegant tomb of the juriconsult Lazzari in San Domenico, a masterpiece by Rossellino," the pseudo-classic Chiesa dell' Unità; but, above all, "the interesting paintings which exist in the churches of the town, first among which stand the frescoes in the Church of Sagrestia and of the Capitulo di San Francesco, in which collaborated two great artists,—one, the pupil of Giotto, whom he aided at Assisi, il Capanna; the other of Pistoia, a pupil of Buffalmacco, Antonio Vito. These frescoes, worthy of being better known not only to the visitors to our city, but to our townspeople," remarks Sig. Chiappelli, "in spite of the sad want of care with which they are treated, still shine out from the sombre walls almost as brilliantly as on the day when they came fresh from the brush of the industrious artists who conceived and executed them." Strictly speaking, however, these are not monuments, and, moreover, our notices did not pretend to be exhaustive.

#### THE BUILDING EXHIBITION IN BIRMINGHAM.

THIS Exhibition, now open in Bingley Hall, Birmingham, under the management of Mr. John Black, will remain open until the 6th proximo. The exhibitors number about 150. Coming so soon after the recent exhibition in the Agricultural Hall, Islington, it necessarily contains a great many things recently described and commented upon in the columns of the *Builder*, but several firms carrying on business in the Midland Counties, who did not exhibit at Islington, have taken advantage of the present Exhibition in the capital of the Midlands.

The Exhibition was opened at noon on Monday by Mr. Barnsley, in the presence of a large number of persons. In opening the Exhibition, Mr. Barnsley said a very cursory view of it must impress them with its importance, both as a matter of interest and instruction. The most casual observer must be convinced of the comprehensive character of the building trade, which embraced, in fact, almost every other trade as well as calling into requisition art and science. He was sure that not only the architects and builders of the town would find abundant to interest them there, but the public at large could go and criticise the inventions and improvements which could be introduced into the erection and for the embellishment of their buildings. He hoped that the young men of the town and district especially would use that exceptional opportunity of seeking knowledge and information, which would be for their advantage in future business life. It was singularly appropriate that an exhibition of this kind should be held in Birmingham, which was universally acknowledged to be a centre of manufacture; and especially was it appropriate at this time, when the town was making such rapid strides in its improvement and in the development of its architecture. He was sure they would agree with him in wishing the movement every success, and he had great pleasure in declaring it open.

It would be impossible (even were it necessary) to mention a tithe of the objects that merit notice, but it may be said that all the departments included in house building and furnishing are well represented. There is little that is not intimately connected with these departments, the "cheap-jack" element having been rigorously excluded. In one part of the hall the process of electro-plating is shown, the electricity being generated by a dynamo-machine driven by an Otto gas-engine, and at night the hall is lighted up by Dr. Siemens' new regenerative gas lights. A new wooden floor has been laid all over the hall.

We wish success to the Exhibition.

#### THEATRES BURNT DOWN.

Bolton.—At an early hour on Sunday morning the Temple Opera House, Bolton, one of the largest provincial theatres in England, was totally destroyed by fire. The building is situated in Dawas-street, in the very centre of the town, and was formerly known as the Temple Mill. About five years ago it was converted into a theatre, and was opened on October 28th, 1877. Last year it was let on lease to Mr. Charles Majilton, who, after spending about 700*l.* in alterations and decorations, opened it on Christmas Eve with the pantomime of "Cinderella." Since the withdrawal of the pantomime the theatre has been occupied by various travelling companies, that of last week being Mr. Charles Dorton's, who produced the "Two Orphans." The theatre was 45 yards in length by 35 yards broad. It contained pit, lower circle, dress-circle, balcony, and gallery, and was capable of accommodating between 6,000 and 7,000. The dimensions of the stage were 60 ft. by 50 ft. The proscenium opening was 30 ft. square, and the combined depth of the magazine and well beneath the stage was 24 ft. The performance on Saturday night was concluded at half-past ten, and for some time afterwards Mr. Dorton and his company were engaged in packing up their wardrobe, the whole of which were carried from the building by half-past eleven. At that time there were no signs of fire, but in less than three-quarters of an hour afterwards, as Mr. A. Passmore, the manager to the lessee of the theatre, was seated in his house, adjoining the stage, conversing with a few friends, a woman knocked at the door and informed him that the theatre was on fire. Opening the sitting-room door and looking across the stage he discovered that the balcony opposite was in flames. Information was immediately conveyed to the Corporation fire-engine house, and in a few minutes the brigade were upon the spot, and had soon ten jets of water playing. From the first, however, there was no hope of saving the building. Owing to the nature of its contents the flames spread with great rapidity, and by one o'clock the roof fell in, followed quickly afterwards by the gallery, balcony, and circles. These fell almost simultaneously into the pit, whence the flames shot up to the height of 100 ft., illuminating the entire town. The brigades of Messrs. Ormrod & Hardcastle, Messrs. Cannon Brothers, and Messrs. Hardcastle & Co., Fawcett, attended, but their services were of little avail. Against the west side of the building were arranged a number of carts laden with coal, belonging to the Atherton Coal Company, and several of these caught fire, but the flames were speedily extinguished. Mr. Hemmingway, the owner of the building, is partly insured. The damage is estimated at about 15,000*l.* The origin of the fire is unknown. It is supposed, however, to have been caused by some one in the balcony throwing down a lighted match, which, falling through a crevice in the floor, had set fire to a quantity of cotton-waste which had accumulated during the time the place was worked as a cotton-mill.

Schwerin.—Telegrams from Berlin and Schwerin announce that a fire broke out in the costume-room of the theatre of that town on Sunday night during a performance. The building was speedily enveloped in flames, but the people had time to escape before the fire reached the auditorium. The theatre has been completely gutted, and only the outer walls now remain standing. The clearing of the house was effected without any accident, the public being informed from the stage of the outbreak of the fire in time to make their escape.

#### DOCK WORKS EXPENDITURE ON THE MERSEY.

ACCORDING to the accounts of the Mersey Docks and Harbour Board, which have just been issued, the expenditure in dock works during the last twelve months was little short of 200,000*l.* The details show that in the engineer's department 140,746*l.* had been expended in works on the Liverpool side of the port, and 40,677*l.* at Birkenhead, on the Cheshire shore of the river, making a total of 181,423*l.* In the harbour master's department the total expenditure was 31,173*l.*; in the marine surveyor's department, 3,488*l.*; whilst in the dock traffic, weighing materials, and foreign animals' wharfs department, the expenditure was

35,942*l.* In the maintenance of the warehouses the expenditure was 32,847*l.*; and in the conservancy of the river, including maintenance of the lighthouses and lightships, and removal of wrecks, 23,715*l.* were expended. The total expenditure during the year, including the salaries of the engineer and his staff, and the secretary, treasurer, and other servants of the Board, amounted to 1,039,309*l.*, while the total income derived from dock rates, town dues, rents, and other sources, was 1,226,497*l.*

#### OBITUARY.

Sir Henry Cole, K.C.B.—We bear with very great regret of the death of Sir Henry Cole, which took place on Tuesday evening, after a short illness, in his 74th year. We defer until next week a detailed notice of his useful public career.

Mr. E. F. Law, J.P.—Mr. Edmund Francis Law, F.R.I.B.A., died at his residence, Northampton, on the 14th inst., in his 72nd year. He commenced practice in the town about forty-five years ago. He enjoyed a large practice, and among his works may be named the new Cattle Market at Northampton, new banking premises and other commercial buildings in the same town, a new cemetery at Wellingborough, and mansions at Stony Stratford and elsewhere. He was largely engaged in restoring churches in the town and county, his principal works in this direction being St. Giles's, Northampton (in conjunction with Sir Gilbert Scott as consulting architect), and All Saints', Northampton. He also built many schools. He was a thoroughly practical, "all-round" architect, and, at the same time, was no mean artist. He lived and died respected by all who knew him. He held the appointment of County Surveyor, and, at one period, that of Town Surveyor. Some eight or ten years ago he served the office of Mayor of Northampton. At the time of his death he was the senior magistrate on the borough bench.

Mr. George Jennings.—We learn with much regret that this gentleman, so widely known by his inventions in the shape of sanitary appliances, died on the 17th inst., in his 72nd year. We shall have more to say about him on a future occasion.

M. Henri Giffard.—From Paris comes the announcement of the death of M. Henri Giffard, the engineer and aeronaut. He was born in 1825, and took a prize from the Academy of Sciences in 1859 for the invention of his well-known and largely-used injector for feeding steam boilers.

#### DISSENTING CHURCH-BUILDING NEWS.

Norwood Green (York).—The foundation-stone of a new Congregational Chapel has been laid at Norwood Green by Mr. Edward Crossley, of Halifax. The new building will accommodate a congregation of 300. The estimated cost is 800*l.* Mr. R. F. Rogers, Brighouse, is the architect.

Rye.—The foundation-stone of a new Congregational Church for Rye, Sussex, has been laid. Mr. Elworthy, of St. Leonards, is the architect, and Mr. Small, of Ore, the contractor, the estimated cost of site and building being 1,200*l.* The building is planned to seat 350 people.

Manchester.—The committee of the Manchester Diocesan Church Building Society, in their report submitted to the annual meeting of members, state that during the year the society has received 4,271*l.* 4s. 2d. for the various departments of its work, embracing church extension, augmentation of poor benefices, and home missions. The donations appropriated to specific objects included special contributions paid through the society for the building of the new churches of St. Mary, Boswick; St. George, Mossley; the parsonages of St. Andrew, Radcliffe; St. Catherine, Manchester; and the augmentation of the benefices of Hornby and Bleasdale. During the past year six new churches were consecrated. Three of these were built by private individuals at a cost of 32,000*l.*, exclusive of the outlay on endowments and sites. Several new ecclesiastical districts were formed within the year, nine churches are in process of rebuilding or enlargement, ten new ones are in course of erection, and thirty-two others are contemplated.



## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 1,568. F. Rander, Manchester. Manufacture of bricks, tiles, &c. March 31, 1882.  
 1,575. W. B. Lake, London. Manufacture of metallic roofing shingles. (Com. by B. Seaman, New York, U.S.A.) March 31, 1882.  
 1,579. D. Summerfield, Aston. Locks and latches. March 31, 1882.  
 1,584. G. L. Shorland, Manchester. Fire-places or grates. April 1, 1882.  
 1,589. M. Menge & H. Krause, Berlin. Apparatus for painting the interior of houses, &c. April 1, 1882.  
 1,596. W. Johnson, Liverpool. Door latches and locks. April 1, 1882.  
 1,607. J. Matthieson, Christiania, Norway. Door locks. April 1, 1882.  
 1,609. F. H. F. Engel, Hamburg. Manufacture of parquet flooring. (Com. by F. H. Schmidt, Altona, Prussia.) April 3, 1882.  
 1,620. P. M. Justice, London. Plaster for mouldings, coatings of walls, &c. (Com. by M. B. Churob, Grand Rapids, U.S.A.) April 4, 1882.  
 1,652. J. J. Wheeler, London. Carbs of roads and footpaths. April 5, 1882.  
 1,655. H. Conolly, London. Water-closets. April 5, 1882.  
 1,695. G. H. T. Beamish, Queenstown. Construction of breakwaters, retaining walls, &c. April 6, 1882.  
 1,719. A. J. Boulé, London. Water meters. (Com. by E. C. Terry, Terryville, U.S.A.) (Comp. spec.) April 11, 1882.  
 1,740. A. Browne, London. Stove. (Com. by L. Breglia, Dresden.) April 12, 1882.  
 1,749. C. Major, Bridgewater. Construction of roofing tiles. April 12, 1882.  
 1,770. W. H. Luther, Glasgow. Construction of metallic baths. April 13, 1882.

## NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

April 11, 1881.

5,747. A. M. Clark, London. Roofs for the protection of buildings in course of construction. (Com. by Comte A. C. de Barbaran, Paris.) Dec. 31, 1881.

119. E. R. Wethered, Woolwich. Window-sash fastenings. Jan. 9, 1882.

April 4, 1882.

5,142. L. A. Grotte, London. Apparatus for warming or heating. (Com. by C. Ostlund, Stockholm, Sweden.) Nov. 24, 1881.

5,571. A. M. Clark, London. Manufacture of floor coverings. (Com. by C. Thayer and V. E. Thayer, Jersey City, U.S.A.) Dec. 20, 1881.

755. R. Weaver, London. Water-closets, &c. Feb. 16, 1882.

April 7, 1882.

5,091. H. Defty, Middlebrough. Apparatus for generating heat and warming buildings. Nov. 22, 1881.

351. J. Holroyd, Leeds. Tanks for flushing drains and sewers, &c. Jan. 24, 1882.

1,019. C. J. Mountford, Birmingham. Fire-resisting bricks and blocks. March 3, 1882.

1,306. W. Simmons, Maidstone. Ingredients for the manufacture of hearthstones. March 17, 1882.

April 14, 1882.

5,381. D. Gill, Weston-super-Mare. Water-closet apparatus. Dec. 9, 1882.

5,433. W. H. Saint Aubin, Bloxwich. Locks or fastenings, &c. Dec. 13, 1882.

5,466. W. Bash, L. Bash, & N. S. Dames, Manchester. Construction of locks and latches. Dec. 14, 1882.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending April 8, 1882.

3,606. C. D. Abel, London. Metallic structures for barracks, hospitals, &c.

This is an improvement on Patent No. 1,877 of 1878, in forming these structures with two concentric ribs instead of one, which, when the sides are filled in with brickwork, form a continuous air space through the building. The double ribs are connected together by ties or struts to increase their strength. (Com. by La Société Nouvelle de Construction, Paris.) Aug. 19, 1881. Price 6d.

8,648. W. H. Stephenson, Blackburn. Heating apparatus.

The pipes, instead of being circular, are of hollow semi-circular or U form, the interior forming the water space.

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

This gives a larger heating and radiating surface. The heat is automatically regulated by an air-tight cylinder, in connexion with a syphon containing mercury, which, as the heat increases and the air in the cylinder expands, is forced up and closes the gas-supply pipe. Aug. 22, 1881. Price 6d.

3,737. H. Knoblauch, Berlin. Ramming apparatus for asphaltic pavement, &c.

Instead of using hand-rammers, a machine is made which has a number of heavy rammers which are lifted in turn by pins or toothed wheels, and then allowed to fall. As the machine is moved forward the surface covered by the blows slightly overlaps each other, so that the whole surface is rendered even. (Com. by E. Dietrich, Berlin.) Aug. 27, 1881. Price 6d.

3,761. R. W. Newlands, Shepherd's Bush. Fitting for excluding draught.

A semi-cylindrical bar is placed on the frame and on the floor under the door, and a rabbet is cut out of the door to fit the bar. Across the rabbet is stretched a piece of sheet india-rubber, which, when the door is closed, presses hard against the bar and excludes the draught. (Pro. Pro.) Aug. 29, 1881. Price 2d.

3,766. W. H. Cutler & J. Chapman, Eton. Apparatus for preventing waste of water.

In the cistern is formed a small chamber communicating with the cistern through an inwardly opening stop-valve, and from the small chamber a syphon leads to the outside. To the handle of the closet is attached an air-compressor, and when the handle is lifted the air is forced out of this compressor through a pipe into the small chamber and forces the water up the inner leg of the syphon, which is thereby brought into action and flushes the closet. Aug. 30, 1881. Price 6d.

3,810. T. le Poidevin, Guernsey. Apparatus for moulding bricks.

A frame is made for a number of brick moulds which have longitudinal bars notched to receive the cross parallel boards. When the prepared clay is forced into the moulds by a roller and scraper, the longitudinal bars are removed and the frame is again fixed together for a fresh lot of bricks. (Pro. Pro.) Sept. 1, 1881. Price 5d.

Published during the Week ending April 15, 1882.

3,713. C. D. Douglas, London. Construction of baths.

This is an improvement on Patent No. 1,438, of 1880, in forming the shower at the end of the bath from which the discharge-pipe issues with an opening or doorway wide enough to admit the hand, so that the valve can easily be examined. Aug. 25, 1881. Price 6d.

3,738. E. Haskell & J. P. Bayly, London. Apparatus for heating by gas.

A metal frame is fitted to the grate, which holds round rock-shaped pieces of glass inside, which are the burners. The first air is led from the back to a condenser of cold water fitted below the grate. Aug. 27, 1881. Price 6d.

3,746. E. Kaulbach, London. Consuming coal and other fuel for heating purposes.

This apparatus consists of a basket for the coals, which is mounted horizontally on standards so that it can revolve and thereby place the fresh-lighted coal below the spent fuel, consuming the smoke. Aug. 27, 1881. Price 4d.

3,796. A. M. Clark, London. Lenses for use in pavement lights, &c.

The upper surfaces of these lenses are either simply conical or formed with radiating grooves. A metal cap is fitted on the centre to protect these surfaces. The lower part projects downwards at an angle of 45 degrees, semi-prismatic shape with an inclined flat reflecting surface and an inclined convex diffusing surface. (Com. by P. Collamore, Boston, and U. Boyle, Springfield, U.S.A.) Aug. 31, 1881. Price 6d.

3,820. T. G. Gordon, Dudley. Facing or enamelling certain kinds of bricks or tiles.

As the stream of prepared clay passes through a box or hopper having a series of dies, which gradually increase in size, inside, it is faced with enamel of Cornwall clay, Cornwall stone, and bone, formed into a thick "slip" by a brush. The stream is then cut off by wire and placed in a warm drying-shed to harden before the bricks are pressed. Sept. 2, 1881. Price 6d.

3,839. C. D. Abel, London. Firegrates for burning dense and filamentous or fibrous fuel.

The grate-bars are arranged to form triangular faces of pyramidal sectional shape on which the fuel is fed from above, and down which the ashes fall. (Com. by A. Godillot, Paris.) Sept. 3, 1881. Price 6d.

3,873. C. S. Rolfe, Westminster. Appliances for preventing the efflux of deleterious gases from drain-pipes, &c.

A casing, made in form of a funnel, has, inside, a dish, and the inlet dips below the edge of this dish, which is in the form of two hemispheres partly cut away and joined together. (Pro. Pro.) Sept. 7, 1881. Price 2d.

4,055. W. White, Abergavenny. Building walls so as to render them damp-proof, &c.

These walls are built as a double wall in two thicknesses, and into the narrow space between is poured a composition made of asphaltic, pitch, and sand or clinkers, &c. These materials are first wet ground and then boiled together, and poured in a liquid state into the narrow space between the two walls as they are being built up. This renders them damp-proof and non-conducting, while it increases their strength. Sept. 21, 1881. Price 4d.

4,297. B. D. Hesley, Brighouse. Asphaltic apparatus.

This is an improvement on Patent No. 2,733, of 1876, in collecting the gases from the pan in pipes wherein are diaphragms of wire gauze. These gases are led to the fireplace, where they are decomposed. An overflow spout is made at the back of the pan to prevent the ingredients boiling over. The central flues are made of fireclay blocks jointed together along the crown, while the back parts are made of boiler-plates. Oct. 4, 1881. Price 4d.

## A ROMAN VILLA.

A DISCOVERY interesting to archaeologists has been made in a wood about a mile from Sudeley Castle. Workmen were digging for stone when they came across the remains of a Roman villa or chapel. The remains of the walls are from 1 ft. to 2 ft. in height, and the building seems to have been divided into small rooms and corridors. One corridor, about 8 ft. or 9 ft. in width, is richly inlaid with tesserae, the principal parts of the patterns being in 1-in. squares. The richest design, however, is that of a floor of an apartment about 8 ft. square, the workmanship being very intricate and handsome.

## THE SMOKE ABATEMENT EXHIBITION.

THE adjudicators in the industrial section of the above exhibition at South Kensington have decided on the second award of prizes as follows:—Fire Bridges: bronze medal, Messrs. Chubb, London, for their cast-iron semi-circular fire bridge; bronze medal, Messrs. Ireland & Lownds, Leek, Staffordshire, for cast-iron tubular fire bridge. Fire bars and grates: Silver medal, the Wansh patent Fuel Economiser Company, London, for the application of vertical grates in steam-boiler furnaces; bronze medal, J. Farrar & Co., Barnsley, for Barber's under-feeding step grate; bronze medal, Mr. J. Collinge, Oldham, for Blocksege's external inclined grate; a silver medal, the Livet Boiler and Furnace Company, Finsbury-pavement, for Mr. Livet's method of setting boilers and for fire-bars. Furnace door: Bronze medal, W. A. Moreton & Co., Blackfriars-road, for a balanced fire-door; bronze medal, the Great Britain Smoke Consuming and Fuel Saving Company, Limited, Mansion House Chambers, E.C.

## THE BY-LAWS OF THE METROPOLITAN BOARD OF WORKS.

## CONCRETE.

ON March 30th, Henry Stone Slegg, residing at 131 Devonshire-road, was summoned before Mr. Barstow, at Clerkenwell Police Court, by Mr. J. Goldie Turner, the Deputy District Surveyor of East Islington, for having formed the foundations of two houses in a *cui-de-sac* out of Drayton Park on land to the east of the North London Railway, of concrete not sufficient in thickness and improperly composed, whereby the by-laws made by the Metropolitan Board of Works under the 16th section of the 41 and 42 Vic., cap. 32, had been infringed. The surveyor gave evidence to the above effect, and produced a drawing showing the relative proportions of the concrete put in and that required by the by-laws; he also called his clerk, who corroborated his statements.

After hearing contradictory evidence given by the defendant's son, and a labourer in the employ of the defendant, Mr. Barstow fined the defendant 20s. The same defendant had been fined, on March 3rd, 20s. for having commenced the above houses without having given the District Surveyor the notice prescribed by the 38th section of the 18 & 19 Vic., cap. 122.

## LONDON BAKEHOUSES.

MR. LAKEMAN, one of her Majesty's Inspectors of Factories, in his report on London bakehouses, says:—

"Germans are gradually becoming the bakers for London, and they in many cases, for want of enlarged means, neglect those rules which we are called upon to enforce. The workman is a counterpart of his master; for, as the one is careless, so is the other. I consider it objectionable to smoke tobacco from pipes and cigarettes during the kneading of dough; I do not think it is cleanly for men semi-nude, with profuse perspiration dripping down their shoulders and arms, to lean over the troughs and work up bread in such a state; nor do I believe that wholesome bread can be made out of unclean utensils. It is undeniable that many of the bakehouses in my London district were unfit for their purpose; and some are so now, being underground, dark, ill-ventilated, damp, very small, unduly hot, often filled with vapour, cobwebs, and dust ornamenting the walls, the holes and corners of these converted dwelling-houses not cleaned out. Sinks were found without traps, uncovered in the bakehouse; the lime-washing done in an imperfect manner; water-closets in the bakehouses, some without water supply or ventilation, the smell from them not agreeable; the refuse was swept under the troughs, where it lay until a large quantity was collected,—this most objectionable practice, which was universal, I am gradually breaking down; and I am credibly informed that the said refuse, when acted upon by damp and heat, generates insects innumerable. I pronounce this to be uncleanly, and



have forbidden it; for I am persuaded that the public should have some satisfaction in believing that a salutary law is now being enforced for their benefit. I do not hope to see upon my next visit to certain bakeries a horse stabled in one, his litter much as would be seen in neglected stables, nor rabbits running about that they may fatten upon the offal floor, nor fowls roosting upon the trough, the lid of which was certainly not open at the time. I have seen liquid manure from a stable running under sacks of flour, and an imperfect drain overflowing upon a bakehouse floor. I have also seen an open drain, 2 ft. square, into which liquid from adjoining premises flowed, and ever which tins of buns were laid to cool; therefore I do not think that for humanity's sake we should regret that the inspection of bakehouses has been added to our duties."

It would thus seem that things are in some places as bad as they were twenty or thirty years ago, when the late Mr. Tremereux and the *Builder* called attention to many such revolting details as those above enumerated.

#### PROVINCIAL NEWS.

**Birmingham.**—The Birmingham Town Council have, on the recommendation of the Gas Committee, adopted plans for the erection of offices for the Gas Department and an Art Gallery and Museum, on land at the rear of the Council House, and have authorised the committee to accept the tender of Messrs. Barnsley & Sons, amounting to £1,022l., for the erection of such buildings, in accordance with the plans and elevations submitted. Alderman Kenrick, in moving the adoption of the report, said the original tender by Messrs. Barnsley was 85,480l., but as this amount exceeded what the Gas Committee thought they could expend on the offices and Art Gallery and as on looking through the quantities they saw some details which might very well be retrenched without any loss or injury to the building, they asked the architect to go through Messrs. Barnsley's quantities and to reduce the amount by about 6,000l. This was done, and they had the assurance of the architect that though some of the adornments were removed still the building was not injured for the purpose to which it was intended to be devoted. The committee hoped that when they had added the amounts already expended to the contract of Messrs. Barnsley, which was now 1,022l., and had paid the architect's commission, and so on, the whole amount would be total of 92,500l., which would leave about 5,000l. for fittings, and they hoped the whole amount which they expended would be within the 100,000l., that being what they had laid down for themselves as the extent to which they were prepared to go. Messrs. Barnsley have undertaken to conclude the work on the present location in two years and a half.

**Stockport.**—The Institution to be known as the Pendlebury Orphanage, Stockport, built by the bequest of the late Sir Ralph Pendlebury, was opened on Thursday, the 20th inst., by Lord Vernon. The building, which, irrespective of furnishing, will cost upwards of 10,000l., has been erected from designs by Mr. J. W. Beaumont, architect, of Manchester. The ground-plan is practically divided into three portions, having communication with each other. One portion is occupied by the house, the second by the offices for out-door relief, and the third by the principal entrance and an assembly-hall. In connexion with the house are provided a day-room, 30 ft. by 20 ft., with separate entrances, and cloak-rooms for boys and girls, large kitchen, offices, and two parlours for master and mistress. On the first floor are two large dormitories and four smaller bedrooms, bath-room, linen-closet, &c. In connexion with the office for out-door relief are provided a board-room, ladies' committee-room, secretary's office, cloak-rooms, and applicants' waiting-room, with separate entrance. The Board-room is a handsome apartment, 30 ft. by 20 ft., lighted from outside with two double-light windows and a large bay, in all of which are window-seats of oak, with carved panelled backs. A panelled table of oak, 6 ft. high, is carried round the room, and the chimney-piece of oak is carried up to the ceiling. The ceiling, which is carried up to two oak beams, resting on carved stone corbels, is divided into panels by oak mouldings. A parquetry border, of oak and walnut, 2 ft. 6 in. wide, is carried round the floor, and fills the whole of the bay-window. The glass above the transoms of the windows is in lead-lights, the monograms of the legatees and Sir Ralph Pendlebury being painted on shields. The ladies' committee-room

has a large bay window, finished similarly to that in the Board-room, but in pitch-pine, whilst the chimney-piece is of walnut-wood, and a parquetry border is carried round the room. The assembly-hall is 66 ft. by 31 ft. and 32 ft. 6 in. high to the flat portion of the roof. The timbers of the roof are all pitch-pine, the bays between the principals being formed into panels by pitch-pine mouldings. The floors of the entrance and inner halls are laid with mosaic tiling, by Mr. Oppenheimer, of Manchester. The elevations of the structure are faced with Ruscon red stock bricks, with stone jambs, mullions, &c., to windows and doors, and moulded strings of stone and terra-cotta. From the centre of the building rises a tower to the height of 98 ft. The contractors are Messrs. Southern & Sons, of Manchester. Mr. Rome has acted as clerk of works. The orphanage provides accommodation for only a few resident children, the principal work of the charity being out-door relief.

**Leicester.**—Mr. Alderman Chambers, the Mayor of Leicester, has received an intimation from Mr. Francis Knollys, C.B., that the Prince and Princess of Wales have consented to visit Leicester on Whit Monday, May 29, in order to open the new Abbey Park, which is now being completed at a cost of over 40,000l. About 120 acres of land have been acquired at a cost of about 30,000l.; ten acres have been set apart for a cricket and recreation-ground, while the park covers ninety-six acres. The Corporation has obtained power to spend 25,000l. in laying it out, building bridges, approaches, &c.

**West Derby.**—The foundation stones of the three chapels to be erected in the new cemetery for the township of West Derby, near Liverpool, which is now being laid out, were placed on the 15th inst. The new cemetery comprises seventy acres, part of the Lower House estate, and about two miles the other side of the village of West Derby. It is divided into sections, intended for Episcopalians, Nonconformists, and Roman Catholics, and a small chapel, in which the burial services will be performed, is to be erected in each section. Mr. F. Bartram Payton is the architect, and Mr. Jonathan Mastcock the contractor for the erection of the buildings.

**Rothwell.**—On Easter Monday an Oddfellows' Hall, which has been erected at the cost of the members of the Polar Star Lodge, of the Manchester Unity of Oddfellows, was opened at Rothwell, Northants. The hall is a commodious building, erected from the designs of Mr. Wm. Dawkins, and it is oblong in shape, being 94 ft. in length and 20 ft. 9 in. in breadth. In its construction pressed bricks with Bath stone dressings have been used, and the roof is of open timber. The contracts for the different portions of the work were taken as follows:—Building, Mr. Tebbutt, 249l. 16s.; carpentering, Mr. Essex, 159l. 10s.; painting, plumbing, and glazing, Mr. Buswell, 38l. 12s.; total, 447l. 18s.

**Goudhurst (Kent).**—A ladies' school is being erected for the Rev. J. J. Kendon, consisting of a residence and school. It stands upon one of the highest spots in Kent, the scenery being charming. The residence consists of a porch and inner tiled lobby, with hall, drawing-room, dining-room, study, &c., with convenient out-buildings. The upper floors consist of bedrooms, dormitories, bath-room, &c. The school, with class-room, is placed at the side. The works are executed throughout of a somewhat plain but strong character, the walls being of the same thickness throughout, bay windows being carried up on either side, and terminating in the roof with a centre pediment in moulded and cut brickwork, the strings (except stone) being of the same material, and are covered throughout with the Aylesford tiles. The works are being well executed by Mr. Alfred Martin, of Horemonden, who has carried out similar works in the neighbourhood under the architect, Mr. Wm. Theobalds, Watling-street, City.

**Art Furnishers' Alliance, New Bond-street.**—One of the features of this year's programme of the Art Furnishers' Alliance, Limited, will be the exhibition during the approaching season of a new kind of glass of English manufacture, which, in point of artistic merit and originality, rivals the finest examples of the old Venetian glass-blowers. The specimens on view will be large and important decorative works, which are in no degree imitative, but have a character essentially original as regards design and treatment.

#### FULHAM INFIRMARY COMPETITION.

Sir,—I desire to call the attention of architects to the inclosed cutting from the *West London Observer* of Saturday last:—

"At the last meeting of the Board, a letter was read from Mr. Joseph Mitchell, one of the competing architects, asking what decision had been come to with regard to the designs of the new Infirmary.—The Clerk stated that he had replied that there had been no decision by the Local Government Board.—A letter was read from Mr. Pilbeam with reference to the proposed new Infirmary, to the effect that it was his intention to offer his services to the new Board free of all charges, in order that any plan required by the Local Government Board might be immediately prepared under the control of the new Board.—Mr. Green said it was a pity the offer was not made before the competition.—Mr. Schofield maintained that work of this kind should be paid for, and not done gratuitously. He moved that the letter should lie on the table.—Mr. Seymour seconded.—Mr. Storey moved that the letter be acknowledged, and the consideration of it referred to the new Board.—Mr. Froy seconded the motion, which was carried by seven to two."

The Mr. Pilbeam mentioned was, it may be remembered, a competitor in the recent competition, and his plans were not amongst those selected by the arbitrator (Mr. Henry Curry). After the final selection, which was in favour of a plan submitted by Messrs. Giles & Gough, and strongly recommended by Mr. Curry for adoption, great dissatisfaction was openly expressed by Mr. Pilbeam, who alluded to his drawings, when the public were admitted to see the plans, a note asking competitors who disagreed with the result arrived at to communicate with him. A large note of interrogation was added to the words, "this competition?" And although the plans were supposed to be still under motto, his own name was attached, with the letters "M.R.I.B.A." or "F.R.I.B.A." I forget which.

Now, sir, I desire to ask whether this gentleman is a member of the Institute? and, if so, whether the fact above stated and the action mentioned in the extract inclosed is consistent with his any longer remaining so? I leave the question to be answered by the Institute itself. If such conduct is possible in members of the Institute of Architects, anything like reform in competition, or increased respect for our profession, is, I fear, impossible.

A MEMBER OF THE INSTITUTE.

#### APPROACHES TO THE LAW COURTS.

Sir,—May I avail myself of your columns to direct attention to the tardiness displayed with regard to the approaches to the New Law Courts? We are now within a few months of this large pile of buildings being complete, and from all I can learn, despite of the danger lately experienced in crossing the Strand, no steps have been taken to settle what shall be done. I hear on the best authority that leases are being lengthened, improvements contemplated, and all with the admitted object of increasing the amount of compensation. It must be plain to you, your readers, and all save those whose work it is to move in the matter, that the longer the change is delayed the more expensive it is sure to become. Only imagine the present traffic of the Strand being doubled. Why, sir, even now at certain hours of the day it is a matter of exceeding difficulty to pass from the north side to Norfolk-street to the Embankment, and only last week I saw a poor old lady knocked down in an attempt to run the passage. Park-lane, or any other lane, may want widening, but surely, however imperative that or any other improvement may be, there is none so imperative as this.

JOSEPH HUTCHINGS.

#### VENTILATION OF HOUSE DRAINS.

Sir.—Your paper of the 25th ult. contains a letter from Major-General F. C. Cotton, on the extraction of sewer gases from houses, which is very complete; but I am in doubt whether he or any one else has ever proposed any plan to extract the gas from the soil-pipe downwards, and I enclose a sketch of a way of effecting it.

It consists of the ordinary soil-pipe carried up full-size through and above the roof, with a cowl made so as to let the wind blow into it, in the manner of a wind-sail (as used on board ship); and another pipe of similar size placed as near the sewer outlet as may be, also passing through the roof and carrying an ordinary cowl. When the wind blows, and the cowl act, the air will flow down the soil-pipe, and noxious gases from the water-closets will go with it, passing the Y junctions in the proper



direction. When any discharge is made from a water-closet, so far from checking the current, it will accelerate and promote it, and the foul air which may be in the sewer will be carried up the second pipe, from which there is no opening into the house, or indeed anywhere except above the roof. In sultry weather, when there is no wind, what gas may be generated in the drains and pipes will find its way out by one or other of the pipes, whichever offers least resistance; but even then the downward action of the water-closet discharge will be in favour of the gas making its escape by the upward pipe.

I have seen the two pipes and the two cowl above the roof proposed before, but never the downward current of air through the soil-pipe. The plan explained in the 65th paragraph of the Local Government Model By-laws provides an inlet for air near the surface of the ground and an upward current of air through the soil-pipe.

H. P. B.

#### ARCHITECTS' QUANTITIES. NEW MODE OF PAYMENT.

It has hitherto been the custom to pay for the quantities and lithography by the builder out of the first instalment, for then there is an inducement for the architect to give the builder a certificate as soon as he is entitled to it. But who ever heard of a builder being compelled to pay for the quantities before he has a certificate? and what inducement has the architect then to be in a hurry to give the builder a certificate? The amount thus to be paid by the builder is between 300*l.* and 400*l.* This, with the tyrannical clauses in the specification and the exorbitant security the builder is asked to provide, places him at the mercy of the architect.

The work to which I allude is proposed to be done in enlarging the Hendon Union. Surely no builder will be found to do the works under those terms. I have had more than forty years' experience in quantities and estimates, but this beats all I have ever seen or heard.

J. P.

#### SLAMMING OF DOORS.

SIR, Can any of your readers inform me of the best practical method for obviating noise in the closing of doors? The rooms in my house are mostly floored round the margin with parquet, and, as the doors shut very easily we are constantly disturbed by "slams," which I am very desirous of obviating.

ALPHA.

#### STREET PAVEMENTS.

##### LIVERPOOL ENGINEERING SOCIETY.

THE fortnightly meeting of this Society was held at the Royal Institution, on Wednesday evening last week, Mr. F. Salmon, president, in the chair, when a paper was read by Mr. Jas. Morgan on "The Construction of Impervious Street Pavements, with special reference to the methods practised in Liverpool." In introducing the subject, the writer stated that previous to 1872 impervious pavements had no existence in Liverpool, and although the late Mr. Newlands, in his published report to the Health Committee, in 1848, strongly recommended, on sanitary grounds, the construction of pitch-jointed impervious pavements, no action was taken for twenty-four years, when the carriage-way of North John-street was re-constructed. The obvious advantages of the system soon became so apparent that at the present time there are within the city not less than 650,000 superficial yards of impervious pavements, all laid within nine years by the workmen of the corporation. This work has mainly been carried out in business streets and leading thoroughfares, and the writer urged the importance of extending the system more generally to the back streets in the densely populated parts of the city, to the entire abolition of boulder paving, with its filth-holding joint. The writer then described in detail the construction of the various classes of pavements and concrete foundations laid in Liverpool, exhibiting specimens of the material used in the work. In referring to wood pavement the author remarked that though the use of wood as a paving material has been strongly advocated of late years by tradesmen in busy thoroughfares, where the continuous din of city traffic is a great hindrance to the carrying on of their business, and a noiseless pavement would be a boon, yet want of knowledge and carelessness in its construction have prevented it from receiving the encouragement from engineers that it undoubtedly deserves. Though next to macadam the most expensive pavement to maintain, yet this excessive cost is counter-balanced by the comfort and quietness afforded in thoroughfares where these conditions are essential to the carrying on of business.

**Wolverhampton.**—St. Matthew's Church, Wolverhampton, has been re-opened, after having undergone thorough renovation and repair. The work has been carried out by Messrs. Bradney & Co., of Wolverhampton, at a cost of about 250*l.*

#### THE GREEK TRIGLYPH.

SIR,—Mr. Fergusson has invited your readers to discuss the ingenious theory of the origin of the Greek triglyph, which he has described in your number of the 15th inst. He will, therefore, I hope, permit me so far to accept his challenge as to contribute to the discussion a few difficulties which have occurred to my own mind, and which seem to stand in the way of an unhesitating acceptance of the hypothesis.

That the Greek Doric entablature is timber construction petrified, every one who looks carefully into the matter must recognise; but questions such as the following suggest themselves when we are asked to see in the triglyph the ends of three planks side by side. 1. Is it probable that in the archaic time planks would be so readily obtainable that the use of them in timber framing would suggest itself to the carpenters of the day? No doubt the shipwright was the artificer who first fashioned strong and elaborate structures of wood. Some of the Lycian tombs are manifestly little else than reproductions in stone of such a structure as a ship-builder would naturally raise; and planks would be wanted for the covering of a ship. But is it not likely that their use would be confined to purposes of covering, and that the framework of a building, like that of a ship, would be made of beams? Powerful saws do not seem to have been known, and planks split and possibly fashioned laboriously with the help of such a tool as an adze would be things to use sparingly.

Again, is not the use of a truss at all rather improbable? In the early Gothic churches we find roofs resting on a beam which occupies the position of the modern tie-beam, but which is really a girder with a post standing on it, and the rafters sloping down from the top of that post.

There seems reason to believe that the Assyrian roofs were flat terraces supported by stout transverse beams. Does not this help to indicate that a less scientific combination than the one suggested by Mr. Fergusson's may be more likely to be the true one?

How would the presence of the *gutta* under the triglyph be accounted for, and how, if this suggestion is true, can we account for the absence of *gutta* from the edges of the triglyph? *Gutta*, no doubt, represent piers or trenails, but trenails would not be drawn into the planks edgewise; and it would be impossible for the truss to hold together unless pins were driven through from side to side as indicated in Mr. Fergusson's diagram. The actual appearances in the marble entablature reverse this, and however satisfactory the truss in three thicknesses supplies a *motif* for the triglyph, there seems to be an absence of consistency, at any rate, in this part of the entablature, with the hypothesis suggested.

T. ROGER SMITH.

#### THE PARKES MUSEUM OF HYGIENE.

A GENERAL meeting of the subscribers to the Parkes Museum of Hygiene was held on Tuesday, in the Museum, University College. In the absence of Sir W. Jenner, Mr. Berkeley Hill (treasurer) was voted to the chair.

The meeting was held to consider the advisability of making application to the Board of Trade for a licence to incorporate the Museum. But before the report of the executive committee was submitted, the Treasurer presented a statement of accounts from the commencement of the undertaking in 1876 to the end of March this year, from which it appeared that the income, including the profits of the International Medical and Sanitary Exhibition, had in round figures amounted to 2,506*l.*, while the total expenditure for the six years had been 962*l.*, leaving a balance of 1,544*l.*

Dr. Poore read the report of the executive committee, which, after giving an account of the work the committee had been able to accomplish since its formation, went on to say that the committee had unanimously resolved to recommend to the subscribers that the Museum be formed into an association under a licence of the Board of Trade. Under such a licence the Museum will enjoy all the advantages of being a corporate body. Its funds will be invested in its own name, the trust will be carried on without break and for any length of time, and the Museum will be thoroughly competent to receive legacies and gifts, and generally to transact business under its corporate seal with as much

readiness as an individual, subject only to the necessary legal restraints imposed by the proposed articles of association. Among other reasons which make the incorporation of the Museum a matter of urgent necessity is the fact that it is about to enter on a new phase of existence. The room at present used as a museum is full, so full that it is not safe to place any more weight on the floor of it; and, further, intimation has been received from the Council of University College that the room will be required for other purposes at the end of the present session.

Dr. Russell Reynolds proposed, and Dr. Steele seconded, the adoption of the report, which was agreed to unanimously.

The draft memorandum and articles of association under which it was proposed the Museum should be incorporated were unanimously approved, on the motion of Professor Corfield, seconded by Mr. Rogers Field.

#### A PARTY-WALL DISPUTE.

PHILLIPS V. THE FIRST AVENUE HOTEL COMPANY.

THIS case, which has already engaged the attention of the Chancery Division of the High Court of Justice, and of the Court of Appeal, was brought before Vice-Chancellor Hall on Tuesday.

The defendants are erecting a large hotel on the west side of Warwick-court, Holborn, and the plaintiffs are the owners of a shop on the east side of the defendants' works and adjoining Warwick-court. The substance of the plaintiffs' complaint was that their premises were endangered by the mode in which the defendants were erecting their party-wall, the result being that the plaintiffs' premises had been condemned by the authorities as a dangerous structure under the Metropolitan Building Act, 1855, and that they had accordingly been peremptorily required to render their premises secure. This they averred it was physically impossible to do without taking down the wall erected (as they alleged, illegally) by the defendants. On the previous hearing before the Court of Appeal it had been suggested that the danger might be remedied by tying the defendants' wall to that of the plaintiffs, and an order was then made that this should be done to the satisfaction of the District Surveyor. The plaintiffs, however, alleged that this remedy had proved ineffectual, and that they were, therefore, in danger of being deprived of their premises under the stringent clauses of the Building Act. They accordingly now moved for an injunction to restrain the defendants from suffering their wall to remain erected so as to prevent the taking down of the plaintiffs' wall, party-wall, and from suffering their wall to be and remain in a dangerous state and condition.

The Vice-Chancellor said (we quote the *Times* report) that if there was a new state of circumstances which had arisen since the decision of the Court of Appeal, the plaintiffs should have sought relief by commencing a fresh action. But, in the circumstances, as represented to him, he could not, having regard to the proceedings in the Court of Appeal, grant the particular relief now sought, which must be obtained, if at all, in the superior courts. He accordingly refused the application.

Against the decision the plaintiffs appealed to the Court of Appeal on Wednesday last.

The Master of the Rolls said that, after what had occurred, it was impossible that the application could succeed. It appeared that the attention of the plaintiffs had been drawn to an opinion of an architect that tying the walls below might possibly be of no use; but, notwithstanding that, the plaintiffs had chosen to accept the defendants' undertaking. The plaintiffs' statement was that, owing to the acts of the defendants, this old party-wall was in such a condition as to be dangerous, and that the consequence was that the plaintiffs must pull down their wall and rebuild it at very great expense. This might become the subject of damages; but it did not appear to his Lordship that, after what had occurred, it was possible for the plaintiffs to succeed on the present motion.

Lord Justice Cotton and Lord Justice Lindley concurred.

The appeal was dismissed, with costs.

**The Social Science Association.**—The Secretary of the Association, Mr. J. Clifford-Smith, has issued a handy little pamphlet, entitled "Hints and Regulations for Congresses," which will be found useful, not alone by members and those desiring to become members, but by town councils and other bodies of the kind who would like a visit to their respective towns from the Social Science Association, but do not know how to bring it about, or what it would involve.



## CHURCH-BUILDING NEWS.

**Horley.**—The parish church of St. Bartholomew, Horley, Surrey, has been re-opened after restoration. The church, which is a commodious edifice, in the Late Early English style of architecture, consists of nave, chancel, and north and south aisles, and on the south side a transept was added towards the end of the last century, and fitted up with pews, belonging to Gatwick House. At the north-west angle is a shingled tower, containing eight bells, surmounted by an octagonal spire. The church contains some fine brasses. The present restorations have been carried out by Messrs. Parmenter, builders, of Braintree, at a cost of between 2,000*l.* and 3,000*l.*, under the supervision of Mr. A. W. Blomfield, M.A. The roof of the nave has been stripped of its whitewash, and the old galleries removed. The organ-gallery, which was formerly over the north door, has been taken down and replaced in the Gatwick Chapel. The old screen around the steeple has been removed, and a platform, with balustrade, erected at the end of the north aisle for the ringers. The fine peal of eight bells, two of which were hung as recently as 1810, has been rehung in a new frame, whilst the tower and steeple have been braced up and strengthened. The windows round the church have been remodelled, but the original designs preserved. The east window has been filled with stained glass in memory of the late Rev. William Holled Hughes, B.A., vicar of the parish from 1853 to 1871. A painted window, from the studio of Mr. Taylor, of Berners-street, London, having for its subject "The Good Samaritan," has been erected at the west end by Mr. John Maple, of Horley and London, in memory of his son. The old font, of simple Norman design, has been transferred to the west end.

**Slaverton.**—This church, pleasantly situated upon the picturesque river Dart, was re-used for the first time on Easter Sunday, after the restoration of nave and aisles. The church was restored a few years ago from the designs of Mr. Ewan Christian, and now, at the hands of the same gentleman, the body of the church has been taken in hand. The main points of the general work are the new roofs and windows, and the replastering of walls. The old piers and arcades have been thoroughly overhauled, the various internal approaches have been laid with encaustic tiles by Messrs. Minton Hollins & Co., of Stoke-upon-Trent; and new open benches have taken the place of the former snugly pews. The church contains very good fifteenth-century rood and parolose screens. These are of oak, richly carved and of exquisite detail. The former has an unbroken run from north to south of upwards of 50 ft. It is in the hands of Mr. Harry Hems, of Exeter, who has underpinned it, and placed beneath its entire length a massive moulded oak sill resting upon a lower one of Bath stone. All the lower panelling, and the seventeen continuous bays above (which constitute the entire screen), are also under renovation. The paint has been removed, and new carved work is being substituted for that which through neglect and decay has for years been missing. Mr. Hems has also, at Mr. Christian's designs, adapted the ornate old Jacobean reading-desk and the quaint pulpit, which dates from Graining Gibbons's period, to modern requirements. The general contractor was Mr. Evans, of Paignton. The Ecclesiastical Commissioners, who own the greater part of the land in the neighbourhood, have been at the main expense of the present restoration.

**Wincle (Cheshire).**—St. Michael's Church, Wincle, built in the reign of Charles I., altered about the year 1790; again altered, resited, and a tower added about the year 1820, and then only a plain, square, barn-like erection, with a flat ceiling, was re-opened on the 13th inst. by Bishop Kelley, acting for the Lord Bishop of Chester, after entire restoration, from the designs and under the superintendence of Mr. Edward Wits, architect, the contractor being Mr. Moore, of Macclesfield, assisted by Mr. Ladwell, joiner, and Mr. Westwood, glazier, &c. The seating and fittings are in pitch-pine, lightly stained, and varnished. The chancel fittings are given by the vicar and his friends, the altar cloth and Glastonbury chair by the vicar, and the lectern by the Vicar of Northwich. The entire cost is about 1,200*l.*, including marble and stone retables, given by the Misses Arnold.

## STAINED GLASS.

**Lymington (Kent).**—The new stained glass in the chancel of this ancient church (dedicated to St. Stephen) was thrown open to view at Easter-tide. The chancel has three lancet windows, with a small circular opening above the central one. The subject of the central window is the Crucifixion, at the point of time when the dying Lord committed his mother to St. John's charge. The legend text is "Woman, behold thy son." The glass is in thirteenth-century style, and is from the studio of Messrs. Powell, Bros., of Leeds.

**Ordsall Church, Rostford.**—Messrs. Camm Bros., of Smethwick, have designed and executed three stained-glass windows for the above church. Two of them have been placed in the west end aisle by Mrs. Brough in memory of her two daughters, Julia Elizabeth and Louisa. The subjects are "Our Lord Blessing Little Children," and "The Good Shepherd." The third window, in the chancel, is the gift of Mr. Robert Newbold, and consists of five lights and tracery. Subjects: "The Resurrection," occupying the three central lights; and "Giving Sight to Blind Bartimaeus," and "The Blind Man bearing his Testimony before the Sanhedrim," in the two outside lights. The tracery lights are occupied by "The Ascension" and figures of Moses and Elias.

## SCHOOL BUILDING NEWS.

**Hebburn.**—On the 10th inst. a building intended for use as a Sunday-school and lecture-hall, erected in connexion with St. Cathbert's Church, Hebburn, Northumberland, was publicly opened. The building has been constructed from plans prepared by Mr. Morton, of South Shields.

**Wellingborough.**—The opening services in connexion with the new All Saints' School Chapel on the Finedon-road took place on Easter Tuesday. The room has been built from plans by Mr. W. T. Brown, architect, and is of red pressed bricks, relieved with Bath stone dressings, and roofed with ornamental tiles. The school is 40 ft. long by 20 ft., with one bay divided off to form a small chancel by an open arched screen, and raised two steps above the floor of the other part of the room. The chancel is provided with altar-table, lectern, &c., which, together with the altar frontal, dorsal hangings, &c., were all gifts to the chapel. Attached to the building is a cloak-room and lobby. The playground, enclosed by wood fencing, surrounds the building, the style of which is Gothic of a late character.

## Books.

*A Treatise on Rivers and Canals, relating to the Control and Improvement of Rivers, and the Design, Construction, and Development of Canals.* By L. F. V. HARCOURT, C.E. Oxford: The Clarendon Press. 1882.

"Rivers and Canals," so-called in the short title on the back and on the first page, forms a useful contribution to a class of literature which is assuming considerable importance. We mean a class containing books of a comprehensive but elementary nature, the true area for the utility of which lies in those wide fields open to the engineer in the Colonies, of which we heard something the other day at the annual dinner of the Institution of Civil Engineers. Far away from cities, professional library, or senior adviser of experience to consult, the young engineer in India or Australia will find in this volume a very useful handbook. The object of the writer, has been, he tells us, to "present, in a simple and concise form, descriptions of the principal and most recent works on rivers and canals, and the principles on which they are based." In the book, however, this order is reversed. Mr. Vernon Harcourt first treats of the meteorological and hydraulic phenomena of rivers, of the measurement of river discharge, of the early and later stages of river navigation, and of the construction and supply of canals. He then enters into the practical questions of dredging-machines and appliances, of fascine work, piles, and coffer-dams; of foundations, of the works for affording a passage from one water level to another, of weirs, and of various works on rivers and canals. This part of the volume is clear and concise, dealing fairly and appropriately with the subject, and leaves little to desire except such a distinct reference to the authorities relied

on as might be available to the student who has access to a library. Thus the expressions, "it is necessary, according to Professor Rankine" (p. 41), and "is estimated by Professor Rankine," rather stimulate than satisfy the curiosity to see what are the actual words of that eminent writer; especially as to such an allowance as a loss of 2 in. of water per day over the whole surface of a canal.

Ten chapters are occupied with the fore-mentioned subjects. The eleventh chapter is a brief, hasty, and inadequate performance, in no way up to the level of the rest of the book. It is headed "History of Inland Canals." The facts stated are few, and the statements are not always accurate. Thus we find, "There are 300 miles of canals in Ireland," the fact being that there are 392 miles of canals and river navigations in possession of companies, 133 miles under the control of local masters, and 227 miles under Public Works Commissioners,—in all 752 miles, instead of 300.

The inadequate mode of dealing with this part of the subject is the more to be regretted from the fact that where there is one man who wishes to be instructed as to the method of making a canal, there are hundreds who are anxious to know what canals are in existence, what canals are in process of construction, and at what cost traffic can be conveyed on canals, as compared to railways. It is hardly too much to say that this is the industrial question of the day. As such, at all events, it is regarded to a great extent by manufacturers, and discussed by Chambers of Commerce throughout England. To treat it with any approach to accuracy would require not a chapter, but a volume. Still, something useful might have been said in a chapter, and, above all, what little was said ought to have been correct.

In the next chapter, on Ship Canals, Mr. Vernon Harcourt does more justice to his subject and to himself. The short notice of the Languedoc Canal has all the more interest from the fact that the construction of a new Ship Canal from the Mediterranean to the Bay of Biscay is at this very moment under discussion in the French Cabinet. "The summit level at Narbonne," we are told, "is 610 feet above the Mediterranean." The total length of the main line is about 140 miles, and there are 119 locks and aqueducts over 55 rivers and streams. In June, 1876, a project was brought forward for a "Grand Canal du Midi," which proposed to transform this ancient and once very useful work into an open canal without locks, the bed of which would be 32 ft. below high-water level. A contemporary in reviewing the project, estimated the amount of excavation requisite at nearly 10 milliards of cubic yards (9,955,869,787) which it would take 200,000 workmen ninety years to excavate. M. Manier, the projector, did not impeach these calculations, but met them by an estimate of a yearly revenue of 7,700,000*l.* As the gross receipts of the Suez Canal, with its unique position of the gateway between the East and the West, amounted, in 1880, to 1,200,000*l.*, M. Manier cannot be accused of any despondency as to the maritime future of France.

There is a good account of the Amsterdam Ship Canal, abstracted, as are most of the following descriptions, from the excellent authority of the Minutes of Proceedings of the Institution of Civil Engineers. The account of the Fen Rivers, chiefly taken from Mr. Wheeler's "History of the Fens," is also clear, though brief. Three chapters on the improvement of tidal rivers will be read with interest and advantage. The accounts of the Liffey, the Yare, the Clyde, the Tyne, and the Tees are taken from the "Minutes." There is a want of references as to the other instances cited, but the work is done clearly and well, and Mr. Vernon Harcourt shows himself a careful abstracter. But the cases which he selects must be regarded rather in the light of vignette illustrations, so to speak, of the various methods adopted by river engineers, than as a general description of river and canal communication. So far, indeed, is the author from attempting such a work on navigation as is supplied, with reference to France, by M. Félix Lucas, in his "Étude Historique et Statistique sur les Voies de Communication de la France," that he describes the future works of the Panama Canal with as much gravity as the actual engineering of other parts of the world. And he has done so while citing on one page the unqualifiable assertion of M. de Lesseps "that the construction of a Ship Canal across the Isthmus of Panama presents fewer difficulties



**Hartlepool**.—On the 11th inst. Mr. William Gray, J.P., laid the foundation-stone of the new Presbyterian Church, at the top of Union-street. The design is by Mr. T. L. Banks, of London, and its estimated cost is £4,500*l.*, exclusive of the site, which will be more than covered by the sale of the old chapel for £300*l.*



**House Property in Paris.**—M. Paul Leroy Beaulieu, in the *Economiste Français*, publishes an interesting article on house property in Paris, and the *Times* gives an account of it. Paris is rapidly gaining in size. She adds some 50,000 or 60,000 souls annually to her population, four-fifths of whom are workpeople and small employés, and yet, wherever you go, what most strikes your eye is that nowhere are modest dwellings in course of construction. The tendency is to construct excessively, at rents varying from 5,000*fr.* to 30,000*fr.*, expensive abodes; and M. Leroy Beaulieu thinks a house property crisis must soon break out, which will considerably reduce rents for a few years. Just as the very dear apartments must diminish in rent as they increase in number, he argues, the more modest dwellings will increase in rent, owing to the proportion of construction not keeping pace with the influx of population. Not only, in fact, is the proportion of increase of dwellings of a modest character small, but great numbers of such dwellings have been and are being pulled down to make way for grand boulevards and avenues stocked with expensive apartments, thus producing an ever-increasing disproportion between the two classes of abodes. A table he supplies from the property register shows the proportion of the different classes of abodes in 1878. Apartments of a rent not exceeding 300*fr.* are numbered 468,641; of 301*fr.* to 500*fr.*, 74,360; of 501*fr.* to 750*fr.*, 61,083; of 751*fr.* to 1,000*fr.*, 21,147; of 1,001*fr.* to 1,250*fr.*, 17,202; of 1,251*fr.* to 1,500*fr.*, 6,198; of 1,501*fr.* to 3,000*fr.*, 21,453; of 3,001*fr.* to 6,000*fr.*, 9,985; of 6,001*fr.* to 10,000*fr.*, 3,049; of 10,001*fr.* to 20,000*fr.*, 1,453; of upwards of 20,000*fr.*, 421; total, 684,992.

**The Coachmakers' Company.**—The exhibition which was held during last week at the Mansion House of drawings sent in for competition for prizes offered by the Coachmakers' Company and by the Committee of the St. Mark's Drawing and Technical School for Coach Workmen and Apprentices, was brought to a close on Friday, when the prizes were distributed by the Lord Mayor. The judges were Mr. Thorn, the master, Mr. Thripp and Mr. O. H. Woodall, the wardens; and Messrs. Robinson, J. B. Woodall, and Chancellor, past masters of the Company. They stated that in all there were twenty-six competitors, showing a great increase on the numbers of last year. As to the free-hand drawings of foliage or ornaments, there were thirteen competitors, with thirty-one exhibits, and of the bulk of those drawings they could scarcely speak too highly. The first prize in that class, consisting of a silver medal and 4*l.*, with the Company's certificate, they awarded to E. H. Harris, a coach-body maker, of 20, Huntley-street, aged twenty; the second to Edward Hewer, of Southampton, aged fifteen; the third to William Philipson, of Newcastle-upon-Tyne, aged eighteen; and other prizes to E. Tronp, of Northampton, aged fourteen, and Henry Hewer, of Hyde, aged twenty-two.

**A New Roman Catholic Church** at Coteshill, Warwickshire, was consecrated last week. The building has been designed by Mr. G. H. Cox, in the Early English style. The contract has been carried out by Mr. Rowbotham, of Birmingham, and Mr. Roddis, of Birmingham, executed the carvings.

## TENDERS

For workmen's dwellings, Sugar House-lane, Stratford.	
Mr. F. Whitmore, architect—	
Bolton & Lee.....	24,902 0 0
Crookall.....	4,504 0 0
Niblett.....	4,419 0 0
Rath & Bro.....	4,500 0 0
Martin.....	4,325 0 0
Bedding.....	4,167 0 0
Jones.....	3,985 0 0
Wood.....	3,893 0 0
Buckell.....	3,840 0 0
Nicholls.....	3,799 0 0
Falcon.....	3,794 0 0
Anger.....	3,787 0 0
Boston.....	3,779 0 0
Brightmore.....	3,750 0 0
Taylor & Ditch.....	3,715 0 0
Bragger.....	3,693 0 0
Gregor.....	3,589 0 0
Hughes.....	3,572 0 0
Sharnam.....	3,550 0 0
Salt.....	3,537 0 0
Red.....	3,345 0 0
Parker.....	3,299 0 0
Gentry.....	3,150 0 0
Wheeler.....	3,115 0 0
Guilebrou.....	3,050 0 0
Casper.....	2,950 0 0

For the erection of lodge entrance-gates, and boundary wall, stable and farm buildings, at Hanger-lane, for Mr. John Carver, (Contract No. 2.) Mr. John G. Gibbins, architect—

John Groves, New North-road (accepted) 24,394 0 0

For twenty-four houses at Radfield Highway, Mr. F. Whitmore, architect—	
Seward.....	25,600 0 0
Mariotti.....	2,330 15 0
Porter.....	2,067 0 0
A. Wheeler.....	4,450 0 0
Brightmore.....	4,407 0 0
W. W. Ward.....	4,357 0 0
Matchin.....	4,420 0 0
Bryan.....	4,320 0 0
Banks & Lee.....	4,330 0 0
Holman.....	4,294 0 0
Finch.....	4,200 0 0
Everard.....	4,200 0 0
Head.....	4,089 0 0
Westralley.....	4,017 0 0
Kirby.....	4,000 0 0
Martin.....	3,885 0 0
Capey.....	3,840 0 0
Taylor & Co.....	3,720 0 0
Newman.....	3,440 0 0
Richards.....	3,350 0 0
Harlell.....	3,324 0 0
Bates.....	3,030 0 0
Guilebrou.....	2,825 0 0

For rebuilding 147 and 149, Curtain-road, for Mr. W. Bradshaw, Messrs. N. S. Joseph & Pearson, architects—

J. Lidstone & Son (accepted) 22,500 0 0

For erecting houses and stables at Hale End, Waltham-stow, for Mr. F. Vincent, Mr. J. S. Brown, architect—

Lipson..... 2,800 0 0

Keyle & Wray..... 750 0 0

S. J. Scott..... 639 0 0

Barton & Son..... 625 0 0

For making sundry alterations to premises, No. 41, Great Ormond-street, and for erecting new studio and chambers in rear of same, for Mr. F. B. Walter, Mr. C. H. Flack, architect—

Gidfield..... 23,450 0 0

Harris..... 2,950 0 0

R. J. Scott, Bristol..... 2,944 0 0

Langmead & Way..... 2,870 0 0

Chapman..... 2,861 0 0

Quick..... 2,810 0 0

Young, Hickman & Frayne..... 2,809 0 0

Wilson & Holsten..... 2,453 0 0

For Hereford County and City Asylum, Mr. Frederick R. Kempton, architect. Quantities by Mr. J. S. Alder—

J. Garlick, Salley..... 21,632 0 0

W. Cullis, Hereford..... 1,500 0 0

E. C. Howell, Bristol..... 1,400 0 0

Hudson & Warwick, Hereford..... 1,410 0 0

W. Bowers, Hereford..... 1,380 0 0

Ashbee & Son, Gloucester..... 1,347 0 0

J. Jones & Sons, Sedgley..... 1,310 0 0

J. Clatterbuck, Gloucester..... 1,275 0 0

H. Welsh, Hereford (accepted)..... 1,248 0 0

H. Collins, Tewkesbury..... 1,240 0 0

J. G. Thomas, Abergavenny..... 1,230 0 0

For six cottages, boundary wall, &c., Sedgemoor-place, Cambervall, Quantities by Mr. W. Hesels—

Laphores..... 23,360 0 0

Taylor..... 2,359 0 0

Smith..... 2,368 0 0

Yearsley..... 2,295 0 0

Good..... 2,263 0 0

Tarrant..... 2,050 0 0

Holliday & Greenwood..... 1,869 0 0

Willis..... 1,987 0 0

Green (accepted)..... 1,779 0 0

For painting and decorating the Chapel of the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, Mr. W. F. Pater, architect. Quantities prepared by Mr. C. R. Griffiths—

E. Toms, Camden Town..... 224 0 0

F. Pater, Peckham..... 228 15 0

W. Wells, Paddington..... 185 0 0

J. Anley, Hackney..... 180 0 0

B. Cook, Farringdon-street..... 171 0 0

S. Hayworth, Kilburn..... 161 0 0

F. Herre, Peckham..... 150 0 0

W. H. Pritchard, Tooley-street..... 133 0 0

W. Wythe, Dalston (accepted)..... 130 0 0

For the re-erection of Nos. 14 and 15, Regent-street, Swindon, and alterations to Nos. 16 and 17, Mr. W. H. Head, architect—

Jackson..... 21,240 0 0

Henley..... 924 6 8

Barrett..... 905 16 7

Webb..... 804 3 4

Wiltshire, Swindon (accepted)..... 807 0 0

For detached house, Petersfield, Hants, Messrs. Peak, Lunn, & Peak, architects. Quantities supplied—

House. Outbuilding.

Peter, Midhurst..... 294 4 3 283 13 9

Frank, Milford..... 876 16 0 87 0 0

Fench Bros., Liss..... 846 14 9 83 19 11

Martin, Wells, & Co., Alder-mot and London..... 810 0 0 82 0 0

W. & H. Lewis, Westmoren..... 695 0 0 75 0 0

John & A. Gammon, Faversham (accepted)..... 659 10 0 67 0 0

For residence, gardener's cottage, &c., at Beckenham, for Mr. R. Fenner, Mr. H. D. Appleton, architect. Quantities by Mr. F. T. W. Miller—

Higgs & Hill..... 47,398 0 0

Jones & Whiffen..... 7,394 0 0

Culls & Son..... 6,580 0 0

W. Smith..... 6,988 0 0

L. & H. W. Roberts..... 6,846 0 0

Clarke & Bresey..... 6,538 0 0

Cox..... 6,288 0 0

Howard & Dorrell (accepted)..... 6,287 0 0

For additions to Corbett-street Schools, Smethwick, for the Harborne School Board, Messrs. J. F. Sharp & Co., architects. Quantities supplied—

Marshall..... 258 13 0

Harley & Son..... 435 0 0

W. T. Bennett..... 417 0 0

W. Whitehouse..... 417 0 0

Jeffrey & Son, Birmingham (accepted)..... 416 12 0

For rebuilding Hospital for Diseases of the Throat, Golden-square, Mr. Luck, architect. Quantities supplied—

Bayce..... 29,494 0 0

Longmire & Burge..... 8,250 0 0

Pritchard..... 8,975 0 0

Jarvis..... 8,972 0 0

Fatman & Fotheringham..... 8,967 0 0

Dobson..... 8,875 0 0

Crookell..... 8,741 0 0

Carless..... 8,741 0 0

Bradman..... 8,475 0 0

Conder..... 8,350 0 0

Nye..... 8,287 0 0

Little..... 8,289 0 0

Lawrence..... 8,227 0 0

Roberts..... 8,045 0 0

Adamson & Sons..... 8,037 0 0

Wall Bros..... 7,938 0 0

Perry & Co..... 7,838 0 0

Sargeant..... 7,838 0 0

Manley..... 7,695 0 0

Nightingale..... 7,691 0 0

McLachlan & Sons (accepted)..... 7,673 0 0

For the formation of about 2,600 feet of new road, 4½ feet in width, on the Heath House Estate, Romford, Mr. W. Houghton, surveyor—

R. Nicholson..... 21,061 15 0

P. Pound..... 795 0 0

E. Wilson..... 650 0 0

T. Huntley..... 619 0 0

Wilkes & Co..... 698 0 0

G. Acock..... 696 0 0

Wainwright..... 584 10 0

G. Whittall..... 545 0 0

W. G. Harris..... 501 0 0

J. Bell..... 459 8 8

J. C. Treman..... 435 0 0

W. Armstrong..... 352 0 0

For block of workmen's dwellings, Brighton, Messrs. Lainsan & Son, architects. Quantities supplied—

Nightingale..... 23,238 0 0

Barnes..... 8,130 0 0

Kirk & Randall..... 8,087 0 0

Jones & Co..... 8,543 0 0

Cheesman & Co..... 8,495 0 0

Langley..... 8,335 0 0

For mill-house, stables, &c., Lambeth Workhouse, Mr. Aldwinckle, architect. Quantities supplied—

Balam Bros..... 23,470 0 0

Sharnam..... 2,300 0 0

Dansford & Clutter..... 2,287 0 0

Priestley & Gurney..... 2,214 0 0

E. & H. Mills..... 1,987 0 0

Parker..... 1,926 0 0

Terman..... 1,923 0 0

Crookell..... 1,844 0 0

Wheeler..... 1,882 0 0

H. & H. Holloway..... 1,868 0 0

Gentry..... 1,850 0 0

J. Holloway..... 1,818 0 0

Gayford..... 1,763 0 0

Richardson..... 1,689 0 0

Shurmer..... 1,629 0 0

For new Petty Sessions House at Wingham, Mr. F. W. Ruck, architect—

T. J. Lucas, Surry..... 21,127 0 0

W. J. Adcock, Dover..... 1,100 0 0

W. J. Wiles & Co., Dover..... 1,016 0 0

H. Mated, Canterbury..... 989 4 0

R. M. & H. Whiting, Ospringe..... 850 0 0

T. H. Lovell, Wingham..... 847 10 0

G. H. Denne, Deal..... 845 0 0

W. Cozens, Canterbury..... 832 0 0

J. Cozens, Canterbury..... 832 0 0

J. Cornhill, Whitstable..... 827 0 0

James J. Wise, Deal..... 879 0 0

W. & S. Denne, Walmer..... 812 0 0

For the erection of one detached and two semi-detached residences, on the Binley-road, Coventry, for Mr. William Perkins, Mr. Herbert W. Chattaway, architect—

H. Price, Coventry..... 2,883 0 0 21,676 0 0

C. Gaskill..... 700 0 0 1,309 0 0

W. Bacon & Son, Foleshill..... 669 0 0 1,259 0 0

C. Haywood, jun., Coventry..... 650 0 0 1,231 0 0

A. Waters, Coventry..... 628 0 0 1,168 0 0

T. Mayo, Coventry..... 588 0 0 1,168 0 0

\* Accepted for detached residence.

For additions and alterations to Brockham Park, Betchworth, for Colonel Seymour, Messrs. Harvey & Prothero, architects. Quantities supplied by Mr. John Leaning—

Less, Joinery Old in Dem. Materials.

Trollope & Sons..... 210,343 2,967 2 66

Higgs & Hill..... 6,880 321 200

Higgs & Co..... 6,485 370 200

Hall, Reddall, & Co., 9,339 288 70

Chappell..... 9,180 318 84

Macey & Sons..... 9,039 278 80

Brass..... 8,987 297 100

For repairs and decorations to the London Crystal Palace Bazaar, Oxford-street, Mr. Aug. E. Hughes, architect—

Completed in 7 days.

Macintosh..... 2,850 0 0

Perkins..... 847 0 0

Phillips..... 858 0 0</





# The Builder.

Vol. XLII. No. 207.

SATURDAY, APRIL 29, 1882.

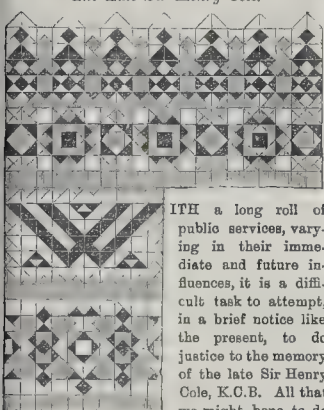
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The Late Sir Henry Cole.



WITH a long roll of public services, varying in their immediate and future influences, it is a difficult task to attempt, in a brief notice like the present, to do justice to the memory of the late Sir Henry Cole, K.C.B. All that we might hope to do in this direction could

not amount to more than a hasty recapitulation of works and events indissolubly linked with his name; but, even in this, completeness could not be here expected.

The news of the death of the creator of the South Kensington Museum; the initiator, and for close on a quarter of a century the administrator, of the Government Department of Science and Art; a philanthropist in a wide sense of the word; a genial and intellectual companion, must have burst with sudden shock upon the country and a large circle of friends, on Wednesday, the 19th inst. For some years back Sir Henry had been advised by his medical man that he would be required to exercise caution in the amount of work he might feel tempted to undertake, in order to preserve his health. It was not merely upon the grounds that he had completed a formal term of public service, but in consequence of his health requiring release from the strains of official work, that he resigned his offices at South Kensington in 1873. Twenty years previously his official coadjutors and assistants could possibly have been counted upon the fingers of one hand, whilst the amount of money granted by Parliament for prosecuting the education of the country's taste in decorative and industrial art could be written in four figures. In 1873, when Sir Henry Cole resigned his office at South Kensington, a single successor was not forthcoming. And it is significant of the extraordinary development of the system he had organised, that the work which had centred in him was enough to occupy four persons, supervised by the Secretary of the Education Department. Thus the general secretarial work was conducted by Mr. Norman Macleod, the work of the Science Department by Colonel Donnelly, that of the Art Division by Mr. Poynter, R.A., and that of the custody and exhibition of the collections at the Central Museum, and of the circulation

of objects into the provinces, by Mr. P. Cunliffe Owen, who was knighted for services in connexion with the International Exhibition in Paris in 1878. The parliamentary vote for Science and Art and the Kensington Museum had in 1873 risen to close upon a quarter of a million of money. These facts may serve to indicate how the seed sown in 1852 had, by indomitable energy and popular appreciation, grown with vigour into a great system of roots and branches, which the unintelligent carplings of quasi-professors of the "dismal science" had naturally been powerless to affect. Indomitable energy was personified in Henry Cole, and with humour a member of the Legislature remarked, in the early days of South Kensington, that there could be "no steam without Coal."

But in thus referring to the work of the institutions at South Kensington, with which his name will be always associated, we have been tempted to stray from our original intention of passing in chronological review the principal events of his remarkable life. He was born at Bath on the 15th July, 1808, and was the son of Captain Henry Robert Cole, of the 82nd Regiment. At nine years of age he went to Christ's Hospital, where he received his education. When fifteen years old, he entered the public service, acting as clerk to Sir Francis Palgrave, of the Record Commission. For nearly ten years he acted in this capacity. During his leisure time he frequently resorted to Westminster Abbey, where Dean Ireland had given him permission to draw. In 1826 he made the acquaintance of John Stuart Mill, having been introduced to him by Thomas Love Peacock, both then of the India House. Amongst other recreations he learned water-colour painting under David Cox, took up with botany and geology, and frequently went to the Opera-house, hearing Vestris, Malibran, Lablache, Devrient, Giulietta Grisi, Tamburini, and others. In a short time he gave evidence of his insight into the disorder of the public records, and the necessity for a change for their better protection and facility of consultation by the public. The records were, so to say, anywhere and nowhere. Some were in the Carlton House Riding School, others in the City, others in Bloomsbury. The appointment of a secretary to the Record Commission, who should undertake the due arrangement of the Records, pressed itself as necessary upon Lord Brougham, and a secretary was duly appointed. Unfortunately the secretary, a barrister-at-law, and totally unfitted for such a purely administrative work, had no wit to appreciate the condition of affairs which it was expected he would have set to rights. It was not long before the secretary's incapacity revealed itself, Henry Cole assisting the revelation. This proved too much for the secretary, who, jealous of his subordinate and having the ear of the Record Commission, more or less successfully managed to turn the tables upon Cole in December, 1835, by calling upon him to resign his post. During the term of his suspension (and he had then married) he wrote

for the Press, and published a number of pamphlets relating to the abuses in connexion with the Record Commission.

Mr. Charles Buller, M.P., was the champion in Parliament who brought the matter forward and obtained the appointment of a Select Committee, whose report resulted in the reorganisation of the Record Office and the reinstatement of Henry Cole there as an Assistant Keeper in 1838. He had thus been for over a year and a half thrown entirely upon his own resources. In 1837 he had become the editor of the newspaper called the *Guide*, and shortly afterwards obtained an engagement under Lord Langdale. In 1838 the question of postage came to the fore. Rowland Hill had conceived the idea that public convenience would be bettered were a uniform rate to be charged for carrying letters in the United Kingdom, and a committee had been formed to prove the feasibility of such a scheme. Postage was then paid for according to distance. Henry Cole, as Secretary of the Committee, assisted the formation of public opinion upon the project, by all sorts of ingenious devices. The Post-office used to convey newspapers, which had been once stamped, without requiring additional stamps. A *Post Circular*, full of squibs upon the anomalies of the existing postal system, was accordingly produced at Cole's instance, and registered as a newspaper. Thus the Post-office was made to itself assist in its own reform by passing on from district to district, and town to town, statements concerning its own imperfect condition and want of reformation. Numerous other devices, such as pamphlets, scenes at the pantomime, and what not, were resorted to by the energetic secretary of Rowland Hill's Committee. He gained one of the four prizes of 100*l.* awarded by the Treasury for suggestions in developing the plan of penny postage. But the story of how the uniform rate, after a strong chance of its being fixed at 2*d.*, was eventually fixed at 1*d.*, has been fully told in the "Life of Sir Rowland Hill," lately published. In the midst of such work Henry Cole naturally came into contact with a number of men of note, and his acquaintance and friendship with many of them lasted for years after, and with some of them up to the day of his death. Amongst others there were Carlyle, Thackeray, and Dickens. It must have been about 1839 that he wrote an article upon "Wood Engraving" for the *London and Westminster Review*, and his inclination to deal with artistic subjects was becoming more pronounced. A work on "Light, Shade, and Colour," which he had been considering for three or four years previously, he brought out at this time. Two years later on, he contributed articles to the *London and Westminster Review* upon "Architectural Novelties in Lincoln's Inn and the Temple," and upon "Prospects of the Fine Arts," this last being a review of the "Report of the Select Committee on Fine Arts,"—a committee which had been appointed to deal with the decoration of Westminster Palace. In 1843 he published, under the *nom de plume* of Felix



Summerly, a series of handbooks to Hampton Court, Westminster Abbey, the National Gallery, the Temple Church, and the City of Canterbury. The publication of his reproduction of Albert Durer's "Small Passion," a journal entitled the *Historical Register*, a new edition of Bishop Tauer's "Notitia Monastica," took place in 1845 under Cole's supervision.

Space does not permit us to touch upon his labours about this time in connexion with the adoption of uniform gauges for railways, and we must hasten to come to the incident from which it may perhaps be said that the South Kensington Museum sprang. The *Times*, in its notice of Sir Henry Cole last week, with forcible philosophy observed that "great national movements like that which has produced the South Kensington Museum, and all that it represents in the social life of our time, are, no doubt, due to causes deeper and more universal than the energy of any individual. But the instinct is, nevertheless, sound in the main which identifies South Kensington with Sir Henry Cole as its creator and chief representative. He was amongst the first to discern and insist upon the paramount need for the organisation of national art, and the development of its relations to national industry."

In 1846 Henry Cole became a member of the Society of Arts, then in a state of torpidity. He at once became stimulated to infuse fresh life into its proceedings, especially in regard to art manufactures. The Society offered prizes for the production of a tea-service and beer jugs, and Felix Summerly was successful in gaining a medal for a tea-service made by Messrs. Minton, — a service which is in use to the present day, and issued annually in hundreds from Minton's manufactory at Stoke-on-Trent. An organisation of artists, manufacturers, and designers was formed at Cole's suggestion in 1847, and amongst those who agreed to proselytise for the good of the country's taste in all sorts of articles for domestic use, and to design for and produce "Summerly's art manufactures," were John Abelson, John Bell, sculptor, C. W. Cope, A.R.A., T. Crawshaw, A.R.A., J. R. Herbert, R.A., J. C. Horsley, a professor at the School of Design, E. Joseph, sculptor, D. Maclise, R.A., W. Mulready, R.A., R. Redgrave, A.R.A., H. J. Townsend, of the School of Design, Sir B. Westmacott, R.A., Messrs. F. Christy, for glass, the Coalbrookdale Iron Company, Messrs. Crosswicks, whitesmiths, Messrs. Dixon & Sons, for Britannia metal; Messrs. Hunt & Roskell, for precious metals; Messrs. Jenens & Bettridge, for papier mâché; Messrs. Lenothers, for bulb work; Messrs. Messengers & Co., for brass casting; Messrs. Minton, for pottery; Messrs. Rodgers & Sons, for cutlery; Messrs. Simpsons, for wall-hangings; Messrs. Wedgwood, for pottery; and others. At the time, the idea was favourably noticed, and the *Spectator* remarked,—"Mr. Summerly has been successful, because he has begun upon a right principle, and has faithfully adhered to it. He has induced those whom he has set to work to make the design spring from the purpose and use of the article designed." It will be at once evident that the organisation for the Summerly manufactures was, of itself, sufficient to bestir a wide interest in the almost neglected consideration of principles of applied design to articles in common use. The Schools of Design, supported more or less by the Government, had, at this time, been in operation for some eight or nine years, but their influence had been little felt. That they could be turned into valuable factors in the regeneration of taste must have been obvious to Henry Cole, for no sooner was he invited by Mr. John S. Lefevre, when Secretary of the Board of Trade in 1847, to make suggestions for increasing the efficiency of Schools of Design, than he wrote three lengthy reports on the subject, which are printed in the appendix of the Report of the Select Committee of the House of Commons on the Schools of Design, 1848. From these reports it will be of interest to quote one or two of Cole's suggestions. He writes,—"It has appeared to me that a working system might be devised whereby the schools might be made to produce designs for those articles which are used in the several Government departments,—the navy, the army, the Office of Works, &c.,—and that these articles might be introduced into the ordinary channels of trade, independently of the schools." And again,—"There should be a permanent collection made of the designs manufactured, which, I believe, might be obtained without cost, by being connected with improvements in registra-

tion (of designs); this collection would, in time, form a museum of national manufactures, of the highest value in all points of view." In his third report he analyses the proposals which had been made for reorganising the Schools of Design, and, with his peculiar keenness to detect flaws and blots, brings together in a brief sentence the evidence that the curriculum of study suggested for adoption in the schools was full of inaccurate and misleading terms, apart from being illogically arranged. He concludes his report thus:—"To sum up these remarks, I would say that the promotion of useful design should be organised as a system, to be made as much as possible self-supporting; and that this system should be made a practical reality, acceptable to the designers, to the manufacturers, and to the public at large."

But we must revert to the Society of Arts once more. Annual exhibitions of British manufactures had, since Cole became a member of the Society, been projected, and some had been held. Supplementary to these, he had framed a scheme to promote the formation of a National Gallery of British Art, by means of public voluntary contributions and an Annual Exhibition of Pictures. In 1848 the first exhibition of this series was that of the works of William Mulready, R.A. All these exhibitions were invaluablely supported by H.R.H. the Prince Consort, who was President of the Society. The *Journal of Design*, which had a more successful career than either the *Guide* or the *Historical Register* (which latter of Cole's literary ventures, Charles Wentworth Dilke, grandfather of the present Under-Secretary for Foreign Affairs, was considered to be the most valuable), was published in March, 1849. This, again, was certainly another of those incidents which in a measure contributed to the reception by the country of the idea of a great exhibition. There had been some little hitch in carrying out the Annual Exhibitions of British Manufactures at the Society of Arts, and it appears that their annual character had been modified to be quinquennial. The quinquennial exhibition was due to be held in 1851, and it was to surpass in its importance and size any of its predecessors. Prince Albert was deeply and personally interested in the matter, and during 1849 and 1850 Henry Cole was in frequent communication with him on this subject. Cole, in company with the late Sir Digby Wyatt, visited an Exhibition of National French Art held in Paris in 1849; and, upon his return, refreshed with ideas useful to the prosecution of the work connected with the National British Exhibition of 1851, he waited upon Prince Albert. The French, it seems, from a circular issued to the Chambers of Commerce by Monsieur Buffet, the Minister of Agriculture, dated 10th Feb., 1849, had considered whether their Exhibition should comprise the manufactures, &c., of other nations. But the Minister foresaw "the difficulties would arise in carrying such an exhibition out"; "there would be no room" to contain such an assemblage of articles, "since the area of the building intended for the Exhibition is calculated for the admission of native productions only." An idea uppermost in considering the National British Exhibition of 1851 was that it should be held in Leicester-square; but Cole submitted that site was not the first point of importance. Should the Exhibition really be confined only to British manufactures? Should it be national or international? To which, after reflection, H.R.H. Prince Albert returned the reply, "International." Thus was evolved the germ of the great International Exhibition of 1851. The site was next discussed, and Cole, without picturing the awful countenances of Rangers, Commissioners of Works, protectors of public rights in public parks, boldly proclaimed Hyde Park as the most suitable site for the great Exhibition. The trouble and labours of gathering together the necessary forces for so huge an undertaking would take a volume to recount. Suffice it here to say that, as every one knows, the Great Exhibition of 1851 of the works of all nations was opened by Her Majesty the Queen and Prince Albert, with all the pomp and brilliancy which such an occasion merited. Whilst the Exhibition was in the height of its popularity, the idea of a museum of manufactures revived in the active mind of Cole. The Treasury granted a sum of 5,000*l.* to be expended for this object, and a committee, consisting of Henry Cole, the late Owen Jones, and Richard Redgrave, made purchases out of the Exhibition as follows:—From the foreign side of the Exhi-

tion, articles to the amount of 2,075*l.*; from the British side to the amount of 893*l.*; and from the East India Company, 1,501*l.* Their official report upon their action, published in the First Report of the Department of Practical Art, contains this sentence,—"In forming this collection, the committee looked to its becoming the nucleus of a Museum of Manufactures, which may have its connexion throughout the whole country and help to make our schools of art as practical in their working as those of France and Germany."

Towards the close of the Great Exhibition, Henry Cole was invited to give up his post in the Public Record Office, where he was still an Assistant Keeper, and to commence duties as general superintendent of a new department of the Board of Trade, to be called the Department of Practical Art, and early in 1852 he entered upon his new duties. Richard Redgrave, his old friend and coadjutor in the "Summerly Art Manufactures," who had been also connected with the Schools of Design, was appointed as a second officer in the Department of Practical Art, to give professional advice in all technical matters touching the province of art-instruction. We cannot here attempt the story of the establishment and development,—like Phoenix from the ashes of the old Schools of Design,—of the elementary drawing-classes, art-classes, and schools of art, throughout the United Kingdom; neither can we enter into a relation of the different methods of Government assistance enervating voluntary effort, by which the present system has come into being. Statistics are always dry, and enough may here be gathered from them if we say that, from the twenty Schools of Design, with about 5,000 pupils, have arisen over 4,700 elementary schools, with 788,661 children instructed in drawing; 640 art-classes, with 26,700 pupils; and 151 Schools of Art, with 30,300 students. The Museum of Ornamental Art, as a means of encouraging general public taste, was first opened at Marlborough House on September 6th, 1852, and a number of fine objects were lent by Her Majesty the Queen, to supplement the collection of articles bought from the '61 Exhibition. Adjoining the rooms devoted to the Museum was a room filled with casts of ornamental art, which was under the charge of the late Mr. R. N. Wornum. The Bandinel Collection was purchased in 1852, and selections to the value of 8,500*l.* were bought from Mr. Bernal's collection in 1854. In 1855 purchases were made by Cole and Redgrave from the Paris Exhibition, of which Cole had been appointed the British Commissioner. But one of the most important of the Museum acquisitions, made chiefly through the assistance of Mr. John Webb, was that of the Soukaine Collection. It was over this that Cole had a battle-royal with the Treasury, who had not at all realised the great importance of the budding South Kensington Museum.

Armed with the confidence of chiefs such as Lord Granville, Mr. Lowe (Lord Sherbrooke), and Lord Salisbury, Cole succeeded, in giving effect not only to the wishes of his masters, but also to his own far-seeing plans. In this respect the *Times* has appreciatively said, "How South Kensington grew amid suspicion, opposition, and obloquy, to what it is at present; how 'Cole, C.B.', persevered through evil report and good report until the 'Brompton Boilers' were replaced by a stately pile, and the despised offspring of the Great Exhibition of 1851\* became one of the most precious and fascinating of the national treasures; how what was once a remote and deserted suburb became the centre of one of the most popular quarters of the town, is a story too long to relate at length, and not very pleasant in some of its details to recall at a time when the leading spirit of the movement has suddenly passed away."

We have chiefly dwelt upon the "art" aspect of the growth of the institution at South Kensington. A few words must be given to the "science" side, particularly as subjects like building construction and mechanical drawing, especially germane to these columns, occupy no small position in the list of sciences encouraged by the Department established by Cole. Out of the Paris Exhibition of 1855 grew up a division of the Kensington Museum, devoted to the illustration of construction and building materials. To some extent these less attractive

\* A wrong inference has been deduced by several writers from the use of this term. It was given to the ugly iron buildings, when they were about to be erected, by the conductor of this journal, solely with the view of inducing the Government to give up the boiler-shaped structure, and erect something better.



collections have been rather sent to the wall in the later years of the Museum's growth; and the brilliancy and beauty of fine and decorative art has not unsuccessfully struggled to cast into dark shade the less attractive scientific collections, whose influence is possibly of equal material importance. The organisation, for founding means of instruction in various subjects of science throughout the country was in some measure, perhaps, indebted to that which had been adopted for instruction in art. But it was even a harder fight to establish its necessity than had been that in regard to art. In 1853, the Department of Practical Art was rechristened, and became the Department of Science and Art, and Dr. Lyon Playfair was associated with Mr. Cole to carry on the science work of the Department. But it cannot be said that a full impetus was given to the science system until about 1859, when Lord Salisbury was Lord President of the Council. Dr. Lyon Playfair had at the time resigned, and Captain Donnelly, R.E. (now the chief officer at South Kensington), was appointed Science Inspector. Statistics indicate the development of the Science system. In 1859, the first examination of teachers of science was attended by fifty-seven candidates, and, saving the Navigation Schools, which had been placed under the control of the South Kensington Department, there were virtually no science classes. There are now some 1,400 science classes, attended by 60,890 students.

The second Great International Exhibition in London took place in 1862, and Mr. Cole was the person most naturally looked to by the Commissioners of that Exhibition for advice and assistance. At this time the utilisation of the great estate purchased by the Commissioners of the Exhibition of 1851, by means of the surplus funds from that Exhibition, occupied Cole's thoughts, and a considerable portion of the property had been converted into the present Horticultural Gardens. In 1861 the Prince Consort died, and from this time up to 1871 Cole worked untiringly to cause the Royal Albert Hall to be built. Through the exertions of himself and the late General Grey a very considerable capital, — over 130,000*l.*, — was raised by means of public subscriptions for sittings in the great amphitheatre. In 1870 Cole's scheme for Annual International Exhibition was published. These exhibitions were opened in 1871 and continued until 1874. During these years he was engaged upon framing the organisation of a National Training School for Music, — an institution where persons of all classes should receive instruction in music gratuitously. The subject of musical education, with which Cole had been closely associated, was taken up at his instance by the Society of Arts in 1865. Numerous reports were issued by the Committee appointed by the Society. The Royal Academy of Music, in *extremis*, was nearly being re-constituted at South Kensington. The re-constitution fell through. The Society of Arts continued its labours for music; and in the Society's *Journal* of last week it is stated that "the organisation by which the free scholarships were obtained was entirely due to Mr. Cole, as indeed, was the whole system on which the National Training School for Music was founded." This school was opened in 1876, and the principles of its organisation are being virtually adopted, with a wider application, for the new Royal College of Music. In 1874 Sir Henry Cole founded the National Training School for Cookery. He had resigned his offices at South Kensington in the previous year, and about 1876 went to live at Birmingham, with the view of aiding the adoption of measures by the Corporation there, for the economical disposal and utilisation of the sewage. Shortly afterwards he removed to Manchester with a similar object. In 1879 he returned to London, and after a short residence at Hampstead, went to live once more at South Kensington. Readers of the *Builder* may remember that within the last few months Sir Henry Cole contributed to these columns an account of the sanitary arrangements of his house in Philbeach-gardens, — arrangements which were discussed with interest by some of our correspondents. Sir Henry's interest in the health of the nation was as true and as warm as that for the health of his own family. The latest project he had formulated was one concerning Guilds of Health, — a design for diffusing common sanitary knowledge, and an acquaintance with the ordinary rules for ensuring health among all classes of the people. The plan, alas! cannot now be

elaborated and expounded by its originator. Still, the main idea of it, as set forth in our pages, is so simple, and so absolutely rests with individuals to adopt of their free will and of their sense of its merit as affecting themselves, that possibly the conference which is to be held upon the "Guilds of Health" at the Society of Arts this year will be sufficient to launch the idea and plant it for growth.

Sir Henry Cole was buried on the 22nd instant at Brompton Cemetery, Lord Granville, Lord Spencer, Mr. Mundella, Sir Charles Dilke, and hundreds of his friends and official *confidés* being present. H.R.H. the Prince of Wales was represented by Sir Dighton Probyn, V.C., K.C.S.I., and her Majesty the Queen and other members of the Royal Family expressed their sense of their loss of a valued public servant in letters of condolence to Lady Cole.

With these words we must conclude our incomplete notice of Sir Henry Cole's life and life's labour. He laboured for the welfare of his fellow-creatures. The influence of his works possibly extends beyond his country, which mourns its loss, and for a long time the country will cherish the memory of one whose devotion to high principles in its service was not the least among the features of his character.

#### ARCHITECTURE AT THE ROYAL ACADEMY.

The most important contribution to the Architectural Room in this year's exhibition of the Academy is the model segment of the dome of St. Paul's, exhibiting the design for a portion of the proposed mosaic decoration of the dome. This, of course, is rather painting than architectural design; but, as it is in reality architectural decoration, it seems proper to group it with the architecture. The main design is the work of Mr. Poynter, — a large circular panel, occupying the centre of the space which forms one of the eight compartments of the dome, being by Sir Frederick Leighton. As our readers who are not in London will wish to have every information in regard to so important a piece of artistic work, we think it well to quote in full the description of the scheme which is furnished in the Catalogue:

"The model represents a segment comprising one-sixth of the dome, and is to the scale of  $\frac{1}{12}$  in. to a foot. The dome will be divided into eight parts by upright architectural ribs. In each space between the ribs will be two large round panels, 20 ft. 8 in. and 12 ft. 8 in. in diameter respectively. The model shows two of these ribs and one of the spaces. Round the base of the dome, and supporting the circular panels, will be eight thrones or architectural seats, one of which is shown in the model, and contains the figure of St. John the Evangelist receiving inspiration to write to the Seven Churches (Rev. i. 11). On the corresponding seven seats will be the Bishops of the Seven Churches. In a circle above all will be the four and twenty elders, four of whom are shown on the model.

The circular panels and medallions will contain the visions of the Apocalypse. Of the large panels, the upper one represents the vision of Christ in Judgment, with the Book of Life open before Him (Rev. xx. 11); the lower, the dead rising from the sea (Rev. xx. 13). In the small panels on the ribs will be visions of woes which fell on the earth. In the panel to the left the sun is darkened (Rev. vi. 12). To the right, a burning mountain falls into the sea, which is changed into blood (Rev. viii. 8 and xvi. 3). In the medallion between the large panels is the angel with the censer (Rev. viii. 3). The corresponding seven medallions will contain the seven angels with the trumpets (Rev. viii. 2).

The groups of figures on the ribs illustrate the choros of praise to the Lamb, which accompanies the fulfilment of the visions in the Apocalypse. — "Every creature which is in Heaven, and on the earth, and under the earth, and such as are in the sea, and all that are in them, heard I, saying, Blessing and honour, and glory, and power, be unto Him that sitteth upon the throne, and unto the Lamb for ever and ever. And the four beasts said, Amen. And the four and twenty elders fell down and worshipped Him that liveth for ever and ever (Rev. v. 13, 14). The lower groups represent the holy on earth, and illustrate appropriate texts from the Psalms of Praise. Each group is accompanied by an angel or heavenly muse, who inspires them with the spirit of praise. Above are the angels who stood round the thrones, alternately with whom will be martyrs (Rev. vii. 9, 12), symbolised by groups of three on each rib, with two youthful angels above on each rib. The whole is crowned by the circle of elders."

In regard to the choice and arrangement of subject, we do not know how far this is due to

the artists, or how far it is suggested by the clerical custodians of St. Paul's; nor can we criticise the choice of subject especially, as that would lead us into other than artistic questions, and perhaps involve us in theological or anti-theological controversy. We cannot understand, we confess, how such vague personages as "the bishops of the seven churches" can be of much interest to any one in themselves; but from the artist's point of view it is evident that this scheme, whatever may be thought of it from a theological point of view, presents plenty of scope and suggestion for varied treatment and expression in the figures; and that, considering it as a great decorative scheme, is the main point. In this respect, we have no hesitation in saying that this is the finest design for treating the inner surface of the dome which has yet been put forth. Although the dome is constructively not a ribbed one, the division of it into ribs and spaces appears desirable; necessary, in fact, for the grouping and requisite isolation of the various designs, and desirable architecturally in order to connect the decoration to a certain extent with the octagonal ordination of the substructure. Whether this architectural division is best obtained by the introduction of a built-up architecture painted in relief may be open to question. We should almost have preferred to have seen the experiment tried of avoiding anything of this kind, and effecting the division by flat painted ribs with a band of ornament between them, leaving spaces for the subsidiary figures; this would certainly have been more in accordance with true decorative principle. The answer naturally will be that the method employed is in keeping with the school of architectural and decorative taste which the building itself represents. This plea certainly is not without its weight, and we should not wish to press the criticism very decisively; but the point is worth considering before it is too late. Another point for consideration is whether, if the division by an architectural rib be adopted, the line should not be rather more decisively marked. There appears to have been an intentional breaking of the line here and there by allowing parts of the figures to project beyond it. Our view is that, if the principle of architectural division be adopted, it should be carried out in as sharp and decisive a manner as possible. Apart from this, the general arrangement of the lines is very satisfactory. It appears to be partly based on the sketch left by Stevens, but is toned down into much more symmetrical disposition of line and with much less of the *rococo* element than appear in Stevens's powerful but too broken and rambling design. As far as one can judge of the figure-subjects on the scale of the model, there is much in them that is fully worthy of the repute of both the eminent painters who have employed themselves on the work. The figures of St. John and the inspiring angel, at the foot of the space between the ribs, are very fine, suggesting (perhaps, almost unavoidably) an inspiration from the Sistine chapel, but not to the extent of anything like plagiarism. On the whole, we regard the design with great satisfaction, as one which will produce a great effect when complete, and will furnish opportunity for the highest powers of some of our first painters, on a larger scale than is generally afforded to artists in these days.

The only other thing which we can very well single out from the mass of drawings as of special interest, is Mr. Ferguson's monochrome view of the restored interior of the Parthenon (1,122), showing the supposed effect of the method of lighting by a clearstory taken out of the slope of the roof, which Mr. Ferguson many years ago suggested as the probable method of lighting the building. He shows between the windows of this clearstory a small order of engaged columns with Temple-of-the-Winds capitals, the window spaces between being partly covered by an iron (?) grille. This grille, and the balustrading in the story below, seem rather Roman in character than Greek. Beyond this, all one can very well say is that, if the Parthenon were lighted in that way, it would have looked very well, that it is perfectly possible it may have been so lighted, and that it is the best suggestion that has been made. To say more than this would be to say more than any one can prove. The iron scrolls, as they appear to be, introduced in the angles at the meeting of the roof-timbers as stiffeners, do not strike us as what the Greeks would very probably have introduced in such a position; they are out of place as ornament,



and not very useful as stiffeners. The view of the temple shows the great statue of Athena facing us at the extremity of the cella. The drawing has been carefully executed, and the restoration is an exceedingly interesting one, however it may be open to some criticism in detail. It is further elucidated by a cross-section drawing (1,121).

Among the general collection of drawings there are a large proportion which it is of no use to particularise, as they show, with little variation, the same features which we have seen in domestic architecture at the Academy for some seasons back—thin brick pilasters, and dormers with scrolls to their gables. There are a good many well-drawn examples of this type, and they serve in the aggregate to represent the prevalent tendency of the day in architecture, which is one legitimate object of the Architectural Room, and, therefore, so far, they have a *locus standi*. It is vexatious to find architects who have shown real power in picturesque and original design taking to this mere imitation of a bastard Classic. Mr. Ernest George, for instance (if he be responsible for the design of "Nos. 46 and 47, Cheapside," exhibited under the names of Messrs. George & Peto), has certainly gone back very much from his old faith in standing sponsor for such a building as this, in which the ground-story has not the slightest reference to the superstructure, the openings being spaced quite independently of the openings and piers above, the solid angle of a tall building resting on an angle-window on the ground story. This is not only not architectural design, it is not even building. Mr. Norman Shaw, who has at times been no little of a sinner in the same way, has in his principal drawing here, "The St. James's branch office of the National Insurance Company" (1,234), shown much better and more rational qualities of design. Here there is a solid basement with arched windows which are kept central with the windows above, and the whole design has something stable to stand upon. In another respect, the followers of what some of them term the Free Classic style may take a lesson from Mr. Robson's design for the "Buildings for the Institute of Painters in Water-Colours" (1,164). Mr. Robson adopts "Free Classic," but it is not made of thin brick pilasters and *rococo* (except one row of those eternal festoons, which he had much better have omitted); it is an application of some of the best qualities of Classic detail in a rather new and effective manner. The solid story at the top, unpierced by windows, we presume represents the walls of the picture-gallery, and has a good effect architecturally, besides explaining the purport of the building; but we presume a lift will be provided for visitors, if the pictures are to be hung on the top story.

There seems to be a reaction in favour of Gothic among the young members just coming into the profession, for we have one Academy medal drawing representing "A West End Club" (1,105), which looks like a dismantled Medieval fortress, and another representing "A Casino for an Inland Watering-place" (1,145), which is like a church more than anything else, though it is not so absurdly and aggressively Medieval as the club-house, which we have before spoken of in reviewing the students' drawings at the Institute. Mr. J. D. Sedding's "Children's Hospital, Finsbury" (1,163), is shown in two very good drawings, but is a curious specimen of want of perception of scale in regard to the different parts; what the great exorcism on the top seen in the exterior view is, we do not exactly make out, but what is quite certain is that it is on an entirely different scale from the substructure, and looks as if it had been cut out of another drawing on a larger scale, and pasted on to this one. To a less extent the same discrepancy occurs in the design towards the internal courtyard, where one of the upper stories seems quite different in scale from the ground story. We see evidence of confusion of idea as to scale not unfrequently in architectural design, but seldom in so pronounced a form as this: much of the design is good, taken in parts, but it is incongruous as a whole. Mr. W. H. Crossland sends two powerful and effective sepia drawings of parts of Holloway College, Egham, in the same style as two which he sent last year, but we somewhat doubt if the drawings, with their marked effectiveness, do not flatter the real effect of the building.

The most important drawing in the department of ecclesiastical architecture is Mr. Pearson's "North Elevation of Truro Cathed-

ral" (1,134), a fine cleanly-executed geometrical drawing: of the design we have spoken on a former occasion. Mr. Waterhouse's "St. Elizabeth's, Reddish, near Manchester," is shown in two fine water-colour views of interior and exterior (1,130, 1,139); it is a large solidly-built red-brick church in Romanesque style, with fine interior; the tower we cannot profess to like very much. Mr. Stevenson's "Free Church of Crieff, Perthshire" (1,102), is a plain, unpretentious, and not unpleasant Gothic church, without any "filigree" about it; the style of this makes it the more surprising that the same architect should put forth such a piece of fiddle-faddle as the two London houses (1,110) hung about with wreaths, and adorned with pots on the angles. Mr. Robson's "London School" (1,113), though nominally in the same style, shows that it may be carried out with much less of this littleness of detail and much more of effectiveness in grouping, in which respect this building is one of the best of the many schools which the same architect has produced for the School Board, and shows a decided advance in true architectural qualities over some of the earlier ones. Among the church designs Mr. Pellan's design for the "English Church at Baveno" (1,174), an interior view, is worth notice; it is an octagon Romanesque church decorated almost entirely with colour on walls and roof, the designs consisting mainly of conventional foliage of early Gothic character, in fine free flowing style. The effect of the whole is very good and refined, and there is a certain originality about it. Another good point in church architecture is shown in the interior of "New Church, Highgate" (1,215), by Mr. Mileham, in which solid brick arches are built across the church instead of timber principals, the purlins resting on the gables of the arches; this gives a very solid and monumental appearance to the interior, without being so costly as a vaulted roof. But what of the acoustic effect? There may be some question about that, we should fear.

In decorative design, Mr. Aitchison exhibits two sides of "a new drawing-room" (1,178, 1,191). One side of these shows the doors, which are apparently mahogany, or else doors coloured to a dark reddish tint of that nature. For once it seems to us that Mr. Aitchison has introduced a discordant note into his work, in these same doors. The prevailing tone of the wall paper is a delicate green, that of the dado grey, and these dark and hot-coloured doors seem to have no harmony with the rest at all. The side without the doors looks a great deal better and more harmonious; the doors seem foreign to the general scheme of colour. The decoration of the corridor of the Royal Mausoleum, Frogmore, by Messrs. Homann & Son (1,206), is heated and disagreeable in effect from the prevalence of tints approaching to pink. Another exhibitor, Mr. O. W. Davis, shows a very carefully-executed and pretty drawing of the side of a drawing-room, an exact reproduction of some of the richer (by comparison) of the Adams' style of decoration. The Adams were among the worst and most feeble colourists who ever practised, and that any one in these days (when we have at least learned to understand something about colour) should deliberately choose to reproduce this kind of pink-and-yellow decoration is a curious example of the influence of fashion. Messrs. Shrigley & Hunt's "Design for Ceiling Decoration" for a house [we presume, near Liverpool] (1,207), is quiet and good; and, as a piece of ceiling decoration, it has the merit of being a properly-centralised design (if one may so put it); that is, it looks the same every way, which we hold to be essential to a ceiling design, which should not contain figures or other elements in the design such as can only look right in one direction.

We omitted to notice a nice piece of geometrical drawing of Classic work, the "Centre Portion of the Glasgow Institute of Fine Arts" (1,196), by Mr. J. J. Burnet. This is a good deal in the style which the late Mr. Thomson acclimatised in Glasgow: free treatment of details, based chiefly on Greek architecture. It is a refined piece of work, but looks very much as if it would require marble rather than stone for its adequate execution. The lower portion, showing the entrance, we gave an illustration of last week. The kind of drawing here exhibited,—carefully executed geometrical drawing to a large scale,—in which the details can be well seen, is the class of architectural illustration of which we should be glad to see more at the

Academy. Mr. Tarver's "New Dining-room, Wadhurst Park" (1,203), shows the carved stone fireplace, with armorial bearings; but the drawing seems to have been hurriedly executed, and conveys an idea of coarse execution in the carved work, which is probably not the case in fact.

Among other drawings in the room, which form part of the record of what has been recently done, we may mention the "View of the Entrance to the New Market at the corner of Farringdon-street" (1,125), by Mr. Horace Jones; "Church of the Transfiguration, Lewisham" (1,118), by Mr. James Brooks; "New Buildings in course of erection at Brasenose College" (1,136), Mr. T. G. Jackson; "New Leadenhall Market," exterior and interior views (1,141-42), Mr. Horace Jones; "Proposed Cathedral for the Falkland Islands" (1,168), Mr. J. O. Scott; "St. Augustine's Church, Croydon" (1,160), by the same architect; and various dwelling-houses, large and small; but nothing on a really large scale in house architecture is included in this year's exhibition, —no mansion of the highest class, that is to say.

We repeat our wish that there should be more of large-size geometric drawings showing study of detail, and less of these mere views, which seem annually to repeat themselves, and which afford no suggestion for such detailed comment as we should be glad to give to a more strictly architectural class of drawings.

#### VARNISHING DAY AT THE ROYAL ACADEMY.

It is only a few of the oldest exhibitors at the Royal Academy who can now remember when the Academicians alone were allowed, within a few days of the first Monday in May, the enjoyment of beautifying their pictures by the fascinating charms of varnish. It used to be said by unhappy outsiders that the painter R.A.'s availed themselves of the entire month of April to paint at their pictures as they hung on the walls of the exhibition; and absurd stories have been told of Turner sending in framed blank canvases, on which he was supposed to paint those marvels that are now so justly prized, and from which artists may long learn many of the greatest secrets of the painter's art. But even in the old and more ungenerous days of the Royal Academy, outsiders who desired to varnish their pictures had but to apply for permission to do so to have their wish granted; after a time this privilege was allowed by right to all exhibitors, and a special day has now, for some years, been set aside for the purpose, when painters may, if they think proper, add those last "artistic touches" which the outside world supposes, with some correctness, do so much in completing the pictorial effect. The experienced painter, however, rarely avails himself of this privilege, of which his younger brethren are so fond; and he is very likely to give the advice, to let the picture alone, a remark that frequenters of the galleries on Varnishing Day must remember having very constantly heard.

Varnishing Day at the Royal Academy presents now a very different aspect to a varnishing day some years back; the whole race of painters of the evidently struggling class appear to have passed away, and, even in these days of eccentric artistic costume, the long hair, the Raffaele coat, and the artist's hat no longer adorn or disfigure our business-like and flourishing exhibitors at Burlington House; although, in these busy days, probably, if we had time to inquire, we should find existing, just as much amongst artists as amongst other people, not a little of that affectation of success which is mistaken for the reality, and a very natural and proper desire to conceal unpleasant facts relating to a little vellum-backed book, the pages of which are not alike equally satisfactory to all artists. We rather suspect that it is this species of literary research, the bank-account question, this combination of brush-work and commercial considerations, that leads to so much hasty and only partially considered labour; for, after all, even the painter must admit, we should think, that he not unfrequently finds himself taking an ill-proportioned interest in the proceeds of his work in comparison with the few hours occupied in the execution of his picture. But the painter of the present day is a very different person,—we had almost written personage,—to the limner of the past, and we should not wonder if he, like his



friend the actor, is not, perhaps more proud of being a successful man of business than of being a thorough artist. In many cases this is clearly so, and we may be tolerably certain that a more than usually successful Academician numbers among his acquaintances many more great merchants and purchasers of pictures than he numbers old artistic friends,—professional, or mere lovers of the beautiful art. In this respect great painters, perhaps, are entitled to the old sympathy that formerly was so often expressed in the phrase “poor artists,” not because amongst the wealthy mercantile classes are not to be found accomplished and agreeable companions, but because in giving up the large and liberal professional intercourse with artists of various kinds and of various degrees, they lose that great incentive to true work, the emulation which is the result of the frank acknowledgment of other men's merits. At all events, there appears, in the present day, a very strong disposition on the part of a great many of our painters to be regarded more in the light of successful money-makers and men of position in society than genuine artists.

#### THE ROYAL SOCIETY OF PAINTERS IN WATER-COLOURS.

The last winter exhibition of the Society suggested a special comment on the remarkably large proportion of fine work exhibited, although in an exhibition nominally of sketches and studies. It may be owing to the expenditure of brain and brush work on that collection of drawings that the season exhibition, which opened this week, is not as strong as some which have preceded it. It is hardly possible, in fact, for any Society to produce two exhibitions annually, and keep them both at the highest point to which the collective talent of the Society is equal.

Mr. Tadema is not represented in the present exhibition, which in itself leaves a notable gap, and Mrs. Allingham contributes less than usual. Her principal work is “The Children's Tea” (248), an interior with figures on rather a large scale than usual with this artist; the children here are upper-class children, and Mrs. Allingham hardly contrives to make them so interesting and expressive as her peasant children, though the technical excellence of the drawing is quite up to her usual standard. Mrs. Angell's masterpiece is “Raspberries” (271), which are almost more real than actual raspberries. Among the best things in the exhibition are Mr. H. Wallis's two continuations of his “Merchant of Venice” series; the one representing Tubal and Shylock (68), the other Nerissa obtaining the ring from Gratiano. The figure of Nerissa, in her maid's costume, looks rather too small and boy-like; Gratiano is a good conception of the character, not too refined. Mr. Tom Lloyd sends a rather large work entitled “Potato Gatherers” (143), a work suggesting reminiscences of the feeling of Jules Breton, but presenting at the same time less pathos in the figures, and more lightness, freshness, and aerial effect in the landscape than we generally find in Breton's subdued and sombre backgrounds. It is, on the whole, one of the best hand most serious works in meaning and feeling that Mr. Lloyd has exhibited, and should advance his reputation. These are the only figure pictures we noticed that are of special or particular interest. Sir John Gilbert exhibits one of his dashing pieces of *bravura*, in the shape of a procession of gorgeously draped figures and horses crowded together; it is effective, no doubt, but, then, we have seen it all so often before. Mr. C. Rigby's “First Letter Home” (220) is an interesting figure, but the point of view does not explain itself very well. Mr. Walter Duncan is unequal and disappointing, and we certainly cannot accept his “Postman and Imogen” (178) as representative of the lovers. “Circe” (168), with two or three of her transformed victims about her, is a superior work to this, and is certainly one of the common run of classical subjects in its treatment; higher interest and pathos would have been given to it if the painter could have made more of the human expression which we might fancy would have been traceable through the disguise of the swinish tabernacle. Mr. Buckman's “The Coast of the Army and Navy” (164) is a good group of soldiers and sailors, and a favourable specimen of this artist's conscientious endeavour to combine the realism of humble life with artistic grouping and effect. The effort to treat

such subjects “decoratively” Mr. Buckman seems to have abandoned.

Among landscapes a striking success is made by Mr. Boyce in the painting of old buildings, in which he was always successful, and in the representation of sunlight effect (in which he is not always so successful) in “Halton Castle, Northumberland” (2); the buildings are beyond praise, and the effect of sunlight coming through the foliage on the left is marvellously truthful. It is curious that the same artist exhibits a drawing at “Bywell, Northumberland” (243), equally noticeable for absence of light and aerial effect, though full of fine detail. Mr. Matthew Hale exhibits a very fine evening scene (157), and Mr. H. Moore a sea and sky in his best style, “A Break in the Storm” (9). Mr. Hale's “Across the Moor” should also be noticed (23). Mr. A. Goodwin's “Nightfall” (36), a forest scene with a red gleam seen through the trees, is certainly fine in general effect; but the red patch of sky is only red colour, not light, nor does the colour appear to us to be such as is possible in an evening sky; at any rate, we never saw it in nature. Mr. Naftel is one of the old contributors who does not, like some others, stand still or go backward; his drawings this year are among the best he has ever exhibited; and in one, “Autumn” (106), he shows a degree of poetic feeling beyond what we have before noticed in his always well executed but generally rather realistic work. Mr. Hunt has some fine drawings, worthy of much looking into, but he is not at his best in this exhibition; his most elaborate drawing, “Summer Afternoon, Sonning” (58), seems to fail partially through over-refinement of execution; it wants force and reality; but this, of course, is only speaking comparatively, in relation to the general tenour of his work. Mr. H. M. Marshall's two principal works in London, “A City Square—St. Bartholomew” (48) and “Westminster—Evening after Rain” (91), are admirable; in these and other drawings Mr. Marshall is doing an excellent work in showing the artistic and picturesque meaning which is to be found in London street scenes, and has made the subject quite his own. Mr. A. Fripp, in “Lulworth” (96) and “Prawn Fishers” (66), realises that peculiarly bright sunlight effect which he has a special power over. Mr. Waterlow's “The Pet Lamb” (39) is an example of powerful and broad water-colour style, of which, to say truth, there is not quite enough in the exhibition, the tendency of some of the best artists of the Water-colour Society being rather too much in the direction of a manner which does not represent the most characteristic powers of water-colour as a medium, and suggests rather the idea of miniature oil-painting. Miss Montalba (131) tries to persuade us that the Thames can show the same silver gleam and bright diffused sunlight effect which she has poured over many of her Venetian scenes. It is, at least, a highly pleasing illusion. The recent member, Mr. Pilbury, continues to exhibit in his drawings the minute, but rather hard, realism which marked his contributions from the first. The best of them is “Sandhills” (188), as the subject is one of the interest of which consists in realistic painting. When we come to deal with broader aspects of landscape in the same way, one can only feel that this is a method of treatment which very soon reaches the limits of its interest, and ignores the deeper and more suggestive elements of landscape. The opposite extreme is reached in the work by the late Mr. S. Palmer, “The Bellman, from Il Penseroso” (61), which occupies the centre position at the top of the room, and which is powerful, and, no doubt, in a sense poetic, but it is not nature. Mr. A. P. Newton has a fine study of a snow-clad mountain (73); Mr. G. A. Fripp is represented by several works up to his usual fine standard, but not among the most striking of his productions. Architects will regard with interest Mr. H. Riviere's carefully-executed view of the Forum at Rome (84). The Society have remodelled the form of their catalogue after the French fashion, placing the names of the artists prominently in the centre of the page, and the title and number of each work beneath the name. Another feature in connexion with the exhibition, also derived from French example, consists in the offer of a shilling book, containing reproductions of sketches in black and white, we presume by the artists, of the principal drawings. These, though slight, are beautiful and artistic little sketches, making a really remarkable shilling's worth, and forming a delightful reminiscence of the exhibition.

#### THE OLD LAW COURTS, WESTMINSTER.

THE proximate centralisation of all the law courts in the Royal Courts of Justice, now nearing completion in the Strand, raises the question for final determination as to what shall be done with the site of the old Law Courts at Westminster. Their demolition was always assumed in connexion with the late Sir Charles Barry's designs for completing the New Palace of Westminster; but so much occurred during his lifetime, and has occurred since his lamented decease, to Burke the carrying out of the plans upon which he had set his heart, that it is to be seriously hoped, now the final opportunity has arrived, nothing will be allowed to stand in the way of their complete fulfilment, as nearly as the altered circumstances will admit. We have often referred to this matter in our pages, but its importance is such to the repute of the late Sir Charles Barry, and his no less lamented son, Mr. E. M. Barry, that we cannot forbear again calling serious attention to the whole matter, not only as one of personal, but real imperial repute.

It is well known that Sir C. Barry's plans suffered grievous detriment at the hands of Parliament and successive Ministers of Public Works. Not only was the Victoria Tower shorn of the graceful finish of the roof intended by Sir Charles, and the substitution of the present garish, almost tin-lookalike staging and flag-staff, but his whole design, as regarded New Palace Yard, was sacrificed to considerations of a very material and sordid character, unless all that has been done there is to be regarded as of a tentative nature only. It is to be feared that the carrying out of his plans in their entirety is now out of the question,—that is, is impossible, though to do so would leave nothing to be desired. These were to complete the quadrangle from the Clock Tower,—now left gaunt and bare, and out of all proportion to its surroundings,—by a line of buildings along Bridge-street, with a very handsome towered gateway facing Parliament-street, and a continuation of a line of buildings masking and flanking Westminster Hall till they fitly joined the present entrance to St. Stephen's Hall in Old Palace Yard. This façade was to include the novel feature of an external arcade, which would have lent considerable elegance and variety to this part of the design. It is not too much to say that, could all this have been carried out, the *tout-ensemble* would have formed an architectural coup-d'œil equal to anything at our universities, cathedral towns, or in Continental cities.

But this was not to be. The construction of the tunnel of the District Railway across the angle of New Palace Yard forbade the idea of the erection of buildings requiring such foundations as those intended, though we must regard this as an irreparable loss to our metropolitan architecture. There is no reason, however, why the utmost should not be done, as far as possible, to carry out the original design, and, where divergency must now arise, to let the remainder at least satisfy the eye and be not altogether a loss of what was originally intended. This would consist in following implicitly the design for flanking Westminster Hall to the point where New Palace Yard commences, and thence to complete the quadrangle by the erection of a handsome Gothic screen in open stonework of fairly imposing height, with gateways of entry and exit. Sculptured decoration here, as in contiguous parts of the building, would be very admissible, and, while comparatively light as to superimposed weight, we cannot but think would be very effective. This is no new idea. Mr. E. M. Barry prepared designs for carrying out something of the kind, and open screens with gateways have always been found pleasing wherever tried, as, for one instance, that of King's College, Cambridge. It would be possible, perhaps, to combine with this an interior arcade, similar to the one now existing along one side of the quadrangle, but of a lighter character, some portion of which could be used as a shelter for carriages and horses in waiting for members, and thus be of much service. The present enclosure of New Palace Yard, consisting of railings and clustered lamps not in keeping with the building, can only have been of a tentative and temporary nature. That there is yet a fair opportunity in some such way as we have suggested of adding a completeness and congruity to the whole design at this point of view we are persuaded, and hence urgently trust that the opportunity presented by the demo-



lition of the old Courts will be faithfully taken advantage of for the sake of the memory of Sir Charles Barry and our national architectural repute.

While on this subject we may add a few words on what is so closely related to it, and that is the ultimate completion of the whole approach from Whitehall to the Abbey and the Houses of Parliament. The various schemes which have from time to time been entertained in regard to this are well known, at least in the architectural and political worlds, but questions of finance have stood in the way, and we must be content with a piecemeal fulfilment. We recently reviewed the scheme just put forth for the erection of the new Admiralty and War Offices on the Spring-gardens site. Without condemning it we could not regard it as an entire abandonment of the scheme to carry out a succession of buildings of a grandiose character from the new Foreign Office to the corner of Great George-street. This would involve the widening of the whole thoroughfare, as included in all former schemes, by the removal of the block of buildings now forming the restricted line of Parliament-street. This is, of course, a foregone conclusion in regard to anything at all to be done in the matter. The vista thus obtained, with a full view of the Abbey and the Houses of Parliament finished as above indicated, would be one of the finest architectural displays which the metropolis could present. But various improvements must undoubtedly suggest themselves. The absence of anything in the nature of a central tower to the Abbey would become more manifest. Though such a tower was evidently intended in the original design, and the Abbey is almost deformed without it, later architects have pronounced against it, because the old work would not now bear the superimposed weight. But this would not prevent a semi-completion by the erection of a handsome *flèche*, which is such a marked feature in many Continental cathedrals, which with the works now in progress at the north entrance would give a finish to the edifice which it has not hitherto possessed.

We cannot also but think that Parliament-square might be advantageously rearranged. Its present bewildering array of lamps, statues, railings, and bedded-out plants is anything but a happy one. A central national monument, emblematic of our Constitutional history, would be far better, surrounded by suitable evergreen shrubs allowed to attain their natural growth. A few powerful effulgent lamps of good design would be more dignified than the present multifarious clustered ones. The statues, with additional ones, might find appropriate positions in the improved thoroughfare of Whitehall on nearing the Parliament Houses. Wide pavements, elegant lamps, a line of trees on each side, and buildings of a sufficiently worthy character, whether public offices or not, though these would be most congruous, would give us a thoroughfare of which to be proud, and of these we have lamentably too few.

We have made these remarks in the spirit of "taking time by the forelock." Some such improvements as we have indicated must undoubtedly occur, and we have pointed out the minimum rather than otherwise of what should be done, unless the opportunity is to be lost of making the locality the finest site in London. Having referred to what may yet be done in the way of partial justice to Sir C. Barry's memory in regard to the Houses of Parliament on the landward side, we would refer to another public building which has suffered, if not equally, yet materially, from the injudicious interference of the authorities. The meagre sky-line of the New Foreign Office is patent to all, and the poverty-looking appearance of the almost isolated statues of the central portion. It is well known that Sir G. G. Scott's original design comprised domes at the ends. These would add very much to the dignity of the building, which, if not, as Lord Redesdale said, "sinning against all the principles of Classical and Renaissance architecture," can chiefly be praised as a noble, imposing pile, without reference to details, but the chief fault of the building is perhaps the wholly insignificant entrance. This ought to have been the leading feature, but actually looks more like a back-door entrance than anything else. This could now only be remedied by a handsome portico, and we are persuaded the building would gain much by this treatment, and we would also decidedly say, that if the central portion could be domed, or otherwise surmounted, in harmony with the domes pro-

posed for the ends, the entire aspect of the building as the chief feature of Whitehall would be immensely improved.

#### MUSINGS ON THE MERITS OF SOME STYLES OF ARCHITECTURE.\*

How well I can remember, a few years since, what was said about a style of architecture which was to be truly characteristic of the nineteenth century! All the new materials were to be introduced, as well as iron, the use of which, before the age of coals and railways, had been so restricted. But iron was lately discoursed on eloquently, from a constructional point of view, in another place, by Mr. Stannard, so that I need not dilate upon it. Iron was to occupy a prominent position in this renovated architectural era, of which the Crystal Palace had been the pioneer. Our instructors, not content with merely prophesying these things, were kind enough to treat us to some specimens, but in stone and brick, of this most precious style of Queen Victoria, the supposed result of the accumulated experience we infants, so to speak, born so late in the history of the world, have gathered from the almost countless generations of our forefathers since the Creation! And what were some of the leading features of the more substantial part of this fresh style,—for the iron era of architecture had not then arrived at maturity, and seems yet a very long time doing so? To my own mind the grandest thing the promoters then expended their pains upon was the adroit manipulation of the—stop-chamber! Every opportunity was greedily seized of—stopping the chamber! And, to compensate the poor thing for this cruel, forced interruption, a little playful twist and turn was continually given to it. There was a notable specimen of this, now swept away, in one of our leading thoroughfares, which, for a day or two, much impressed my youthful imagination in those times.

The publication of Viollet le Duc's "Dictionary of Architecture" was, no doubt, an important factor in the stop-chamber mania. For in Mediaeval France, particularly in the case of joinery, this feature was not infrequent, much more so than in English work. All the grand points, however, of the Frenchmen were neglected by this particular school, who only imitated the chipping and cutting-about contrivance, so that the result was by no means pleasing. Happily, the stop-chamber style has almost died out, and likewise with it the cuckooery of a Victorian architecture. So much for one of those frothy bubbles of popular taste or fashion which, it is to be hoped, as the world grows older and wiser, will recur at longer intervals. For history, as experience has amply proved, will repeat itself. We are none the less working quietly, and not so noisily, in the direction of some architecture which shall be thoroughly consonant with modern requirements and notions, and characteristic of this age.

One of the most healthy signs of the times seems to be the absence of rancour among the enthusiasts of different architectural styles, so there is no likelihood of our incurring the fate of those historical cats of Kilkenny. Minor differences may be sunk without sacrificing great principles. There is no less vigour in anxious striving, nor less earnestness of purpose; but we cease to hear the perpetual din of war,—the so-called "Battle of the Styles."

Without going farther back than about the close of the last century in the history of architectural styles, there have been a series of revivals, commencing with the Greek movement, the Roman, the English Gothic (the latter ending, so far, with the transplanting of many Italian and French Gothic features), and, lastly, the Queen Anne style. The adoption of the French Renaissance of the period of the châteaux on the Loire has also been not uncommon, though not so general a fancy as the others.

All revivals must, in the nature of things, be to a large extent ephemeral, much depending on the caprice of fashion. I cannot but think that, if the merits of some styles (not necessarily those just mentioned) are carefully reviewed and dissected, useful matter for study may be found.

There can be no greater mistake, in my humble opinion, yet it is often made, than to imagine that the rules of common sense and of architectural propriety are more applicable to one style than another. The principles of architectural purity

must of necessity be unchanging, everlasting. No amount of casuistry can get over this,—be the style Chinese or Batty-Langley. To speak yet more plainly, art (and the very essence of true art must be purity) is catholic. The great architect so lately taken to his rest from our midst, in the prime of life, eloquently put such an idea forward publicly, not long since, much to the delight of many who had, perhaps, previously deemed him too much enthralled in the chains of one particular style.

It is a valuable rule in design to unflinchingly cast aside all temptations to extraneous or misplaced ornamentation, to apply the ornament, in fact, in the suitable position, regardless of the exigencies of fashion,—to keep a tight curb on. Oh, would that every architect could in his mind's eye fancy himself in the position of a witness in a court of law, cross-examined by a hostile counsel, and be prepared to give a reason of some kind for every portion of his composition! What a "badgering" the unfortunate architect would undergo! But, supposing a man could pass scatheless through this dread ordeal, how very superior his work would be! In these days of "Flying Dutchmen" and "Wild Zulus," or, in other words, in these expression-train times, it is most difficult to deliberately give that amount of study which a sincere lover of his art would wish to bestow on every minute detail.

As the natural outcome of this, I cannot do better than quote one or two of the admirable axioms of good Sir William Chambers, in his work on "Civil Architecture," which, though applied to the practice of the more severe Italian style, are equally good for any other. Probably Chambers is little consulted by the advocates of the "Free Classic" style, but I venture still to think his book on "Civil Architecture" to be a valuable text-book. It was about the first I read as an architectural student, and many of his sensible observations sank so deeply into my mind as to be still well remembered. Here is one:—

"It is sometimes customary to adorn dies of pedestals with projecting tablets, or with panels sunk in, and surrounded with mouldings. The former of these practices ought seldom to be admitted, as these tablets alter the general figure of the pedestal, and, when they project much, give it a heavy appearance; and the latter should be reserved for very large pedestals only, of such kinds as those supporting the Trajan and Antonine columns at Rome and the Monument in London, where they may be filled with inscriptions, or adorned with bas-reliefs, analogous to the occasion on which the column was erected. Even in the largest buildings, pedestals are commonly too small to admit of such ornaments, which only serve to give them an unsolid trifling appearance, and contribute to complicate without improving the composition."

Now, whatever school of architecture one belongs to, such a comment as this ought to have weight. But how often, in Elizabethan and Renaissance work, have no such rules been observed! Here is an amusing remark of our authority:—

"Some authors are very averse to pedestals, and compare a column raised on a pedestal to a man mounted on stilts, imagining that they were first introduced merely through necessity, and for want of columns of sufficient length."

It is very rare in Mediaeval English work find shafts placed on pedestals, and where, in modern Gothic church architecture, it has been attempted, in the endeavour to show the bases of the piers above the seats instead of their being rather put out of prominence, the result has been unsatisfactory. But pedestals, judiciously set in the proper places, are valuable handmaids to the architect.

Let me give another short extract from Chambers, which is true of any style, and implicates a rule far too often lost sight of:—

"In all arches it is to be observed that the circular part must not spring immediately from the impost but take its rise at such a distance above it as may be necessary to have the whole curve seen at the proper point of view."

What this means in Gothic phraseology is that the distance from the springing line of the arch to the abacus should be the same dimension as the projection of the abacus beyond the wall. In fact, the practice of stilted arches, as it is termed.

In another place Sir William Chambers remarks:—

"Some writers there are who object to pediment, as interior decorations, because, say they, when the whole is covered and enclosed there can be no

\* By Mr. B. Edmund Ferrey. Read at the meeting of the Architectural Association, April 21st, 1882.



occasion for coverings to shelter each particular part. In this, however, they seem to carry their reasonings too far; a step farther would lead them into the same road with Father Langier, who, having sagaciously found out that the first buildings consisted of nothing but four trunks of trees and a covering, considers almost every part of a building, excepting the columns, the entablature, and the pediment, as licentious or faulty, and in consequence thereof cavalierly banishes at once all pedestals, pilasters, niches, arcades, attics, domes, &c. It is only by special favour that he condescends to tolerate doors, or windows, or even walls."

I should explain that the Father Langier against whom this amusing skit is directed was a French abbé who lived about 1730, and who wrote a popular work on architecture, of which (as may be imagined from the above extract) he knew little or nothing. Yet this book took the public fancy amazingly, created a great sensation, and went through several editions. Now in Gothic buildings, similarly, the use of string-courses and hood mouldings to doors, windows, &c., has been sometimes aimed at, and even upon as being senseless. And, as a rule, I must say that such features internally are better omitted. Yet, in a plain building, with walls undecorated and colourless, it must have often been found most difficult, with a flat surface, even though incised or sculptured, to give that vigour and boldness of effect which in this climate is so much wanted internally. Projecting string-courses and labels are a powerful aid to the desired result. I will make but one more quotation from our sagacious authority:—

"In regular architecture, no other form of pediment can be admitted besides the triangular or round."

Illustrations are given, as doubtless you all know, by Chambers, of forms of pediments to be avoided, such as the now fashionable way of cutting a pediment in half in the centre, and sticking a bust in the gap. I expect, however, there are few here who would thoroughly endorse all his severe academic ideas, the most approved forms of pediments to-day being designed quite regardless of any such axioms. How many excuses are made to defend fantastic forms of this kind! Some will say, "Let us have a little play of fancy, a little relaxation from the formal straight line necessitated by the original outline of the roof behind the pediment." Or another one will remark, "We ought not to inquire too critically into the first meaning of the raking coping, but should now simply regard it as a decorative feature only."

To my unsophisticated mind such an admission opens up the very flood-gates of the stream of architectural licence. Once admit the virtue of the mutilated "broken-in-the-middle" pediment, and there can be no valid objection to the huge sham façades of an Italian Gothic church, with the roof down, down, down behind them in the depths below. Then even the extravagances of the Churrigueraesque style of Spain, or the Baroque of Italy, may be condoned, notwithstanding such examples as that at the University of Salamanca, where a peculiarly-formed half-arch, half-orbel, exists, the strongest parts of which in point of construction have been cut away for supposed ornament, in defiance of all architectural propriety. I may remark, in passing, that in the debased Perpendicular style something equally bad occurs in some of the door and window gables, which are in reality lintels cut into the form of arches, and consequently having the advantages of neither. In truth, the Medieval work of our own country is not entirely free from occasional shams; as, for example, the gabled ends of the lean-to aisles of the choir of Lincoln Cathedral.

I cannot consider the western façades of Lincoln, Peterborough, Salisbury, or Wells, to be shams, as no pretence is made to wholly follow the lines of the roof behind, though for this reason more than one eminent critic has raised his voice in disapproval. The ornamentally-shaped and moulded gables of the Elizabethan period, and the eminently picturesque dormer windows of the châteaux on the Loire, abide by a different rule; for they are definitely arranged to follow the roof lines at the back of them, much on the same principle as mouldings in Medieval English work, when they are arranged on the chamfer or the square-ordered plan system. In nature the same idea exists, the serrated forms of many leaves being based on an imaginary enclosing line. But this text of a "broken pediment" must not take up the whole of this sermon. Very likely it may be said, "It is very easy for you to put your foot

down upon this poor detail, and abuse it. But, my good sir, what are you going to give us in exchange?" My answer is that, instead of being led like a flock of sheep in pursuit of the very peculiar details of late debased Dutch architecture, let us rather study the beauties of that early Renaissance typified in England by the earlier Elizabethan, or in France by the elegant châteaux on the Loire. Instead of the broken pediment, I would advocate the coronet for windows. The idea, the faint shadowy outline of the roof or covering to throw off the wet still exists. But there is no pretence of starting with a copy, and then stopping short. The design of these coronets affords endless scope to the artist for fancy or variety of forms, as they can readily be made very simple or very elaborate. They are not, of course, so applicable to dormers. As for the objection about soot and dirt, wet and frost, being liable to get into the interstices, that is inevitable, unless only the most severely designed forms are adhered to. Respecting the dormer windows, the châteaux on the Loire give us excellent specimens, plain or very enriched, as may suit best. Perhaps I ought to say that I am well aware that that great master, Inigo Jones, did not object to the kind of pediment previously mentioned with a bust in the middle, as he had proposed to employ it to windows and elsewhere in the Palace at Whitehall,—that magnificent scheme destined never to be carried out. But "two blacks do not make a white," and even the illustrious Wren at St. Paul's was notoriously the perpetrator of more than one glaring inconsistency.

An elegant specimen of a window coronet exists in the Piazza Navona, Rome. I almost tremble to think whether it is a broken pediment, and so to be condemned. But the gracefully curved lines between the vases and the lady's head, acting as a bracket to the central vase (which is well lifted up instead of being buried in a deep hollow like the unfortunate bust), seem to me to disarm hostile criticism.

Let me proceed with some comments on our English styles of architecture, commencing with Norman. Some of the ornamental mouldings of this period are beautiful and suggestive, while others, as we know, are rather rude and coarse. I do not allude to the quaint cat's head, the chevron, billet, and some others, but to those ornaments which approximate to carving,—I mean such ornaments as any intelligent country mason can execute, if he is furnished with clear, full-sized details. It is surely much better to do this than to be horrified by the sight of bad carving,—the work of a quasi-carver, not a real one,—which, quite unintentionally, is far more grotesque than if its originator had purposely intended to be funny.

Whatever opinions may theoretically have been formed about Norman architecture and its rudeness must be dispelled at the first moment when entering such a cathedral as Durham, the nave of which is, I suppose, about the most magnificent example of the style in this country. The immense cylindrical piers, which, if left smooth, would have looked very heavy, are judiciously relieved by slight and varied ornamentation, such as a kind of reticulated pattern, the chevron, and the delicately incised channel twisting round the pier.

It is worth while for a moment to mention the different ways in which, in various styles, columns are (1) wreathed; (2) twisted; (3) spiral in themselves, or, in fact, cork-screwed, to use a homely illustration. The Norman work at Durham appears to me to have the best and most legitimate treatment, as the wreathing takes away no appreciable proportion of the substance, while in appearance it adds to the strength. The second kind is on the principle of a number of strings or ropes all curled round together. Here union is strength, and the very fact of the curling has that effect which, in nature, we sometimes see in climbing plants. In Romanesque and Byzantine, and in Italian Gothic architecture this kind of shaft is, of course, very usual. But, as a matter of fact, when employed in iron, wood, or stone, this twisting simply means that so much has been taken away from the redundant substance of a pier to give it a more ornamental appearance. The third species of twist is where the section of the column itself is spiral or crooked, of which the porch of St. Mary's, Oxford, is a well-known example. To most architectural eyes at the present day the appearance is very unpleasant, and ill-calculated to support weight.

To return to the Norman period. The views of Classicists, from Wren downwards, are well

known. I need scarcely say that I cannot agree with the authority,—Chambers,—previously quoted, in his opinion on Norman:—

"Our Saxon and Norman forefathers, ultimate corruptors of the almost effaced Roman architecture, sufficiently prove, by the remains of their churches, monasteries, and castles, to what extent barbarism may carry deformity, gloom, unwieldy grandeur, and clumsy solidity."

There is scarcely anything more curious and remarkable in history, as regards the arts, than the constant change in taste from generation to generation. Only that which is intrinsically good will bear the test of the crucible of time. Details and features much admired in one decade are tabooed and despised in the next. In literature, also, the author or poet who was the popular idol in his day, is sometimes forgotten in the next century; while he who was little known to fame in his lifetime becomes immortalised after his departure.

I proceed next with a brief note on that very charming style, the Transition between Norman and Early English, of which we have such noble examples in the Yorkshire abbeys, the favourite study of that dear old friend to the Association, the late Mr. Edmund Sharpe. The great advantage this style had over the preceding one was the possession of the pointed arch. But another important feature has always impressed me as being particularly well treated in this period. I allude to the capital. In the earlier types of the Transition the somewhat cumbersome and unadorned cushion capital, square in plan, is replaced by a development of the same form with circular abacus, but lightened by delicately-carved foliage sunk in; while the bases are not only enriched by the leafy angle spurs, but an appearance of strength afforded them, owing to the emphasis at the angles. The nook-shaft to the corner of towers and buttresses and other angles, which one sees in early work, is generally considered to give force to the angles. But in that I find it difficult to follow the argument, as the sharp plain arris is surely stronger and more massive in appearance than the rounded contour with the two hollows on each side of it. The only way of contriving a good substantial finish with this shaft is to make the line of the wall above the abacus and the shaft identical, or, in other words, to do away with one of the most characteristic advantages which the Medieval men have over the Classic. Let me explain myself. I mean the manner in which the capital serves not only as a fitting crown and termination to the shaft or pier, but as a kind of orbel for the wall above, the latter being thicker than the diameter of the pier. So the arch overhangs. It will thus be found far more easy to use an effective section for the mouldings of the capital, as there is so much more play for its bell. Possibly to some here what I am now saying is a twice-told tale. But I have been constantly surprised to see how often this essential principle is disregarded by those whose position would have made one think they knew better. Thin, meagre walls are partly the inducing cause of this neglect, for in some cases the diameter of the pier or shaft would be reduced to infinitesimal proportions if there was the proper amount of projection above the capital. In the Late Perpendicular period, when walls were thinner than in earlier styles, the diameter of the piers and the thickness of wall over them is very often the same.

Time will not permit me to enter upon the curious and very interesting question of the dilemma the Roman architects found themselves in when, instead of putting a lintel on the capital, they wished to superimpose an arch. That uncomfortable fragment of entablature was terribly in the way, though whether boldly cutting the Gordian knot, and abolishing the entablature, was an unmixed advantage, I will not pretend to say. I have thought proper just to mention it, however, in connexion with the question which I have been discussing.

There is, as I have before said, scarcely any architectural feature of greater importance and prominence than the capital, which forms the preparation for the arches and the superstructure of a building. Consequently, we find in all styles great care and attention have been bestowed upon it. Where the capital has been neglected the other details have been below par. For example, in the debased Perpendicular (to be noticed in due course) the caps are generally among the poorest and most meagre features. I trust that, from the remarks which have already fallen from my lips, I may be deemed no bigot; but, though not infrequently having



taken up my pencil to draw Perpendicular work. I do not remember ever sketching a capital of this period, though I have more than once been struck by the picturesque variations in the plans of the bases.

In the succeeding period to the Transition, the Early English, some of the most beautiful and common-sense types of capitals are found, a rare combination of the merits of moulded and carved examples. Few objects in architecture are more charming than a really good and effectively moulded capital, particularly when it has a double bell, with possibly the elegant dog-tooth ornament peeping out of some dark undercut hollow. But, as soon as carved foliage is essayed, much care has to be taken not to weaken the appearance of the capital, and to prevent its looking crushed by the weight above. The early French architects managed this very cleverly, as I shall hope to point out. In England, also, this was generally, though not universally, done. In Early English work are some exquisite specimens of this eminently simple form of capital, a cross between a moulded and a carved one. Of course, in such a case more than usual care has to be bestowed on the carving, which becomes much more conspicuous than standing alone in company.

As the Early English style advanced towards maturity, the sculptured foliage improved, and, I believe, no style in the wide world affords purer and better examples of it. Having already commented on the character of the mouldings of this period, I will but remark that it is only in the early French, or early North Italian Gothic, styles that anything like it, though not equal to it, is to be discovered. The enriched mouldings are less formal than those of the Norman, and those half concealing themselves in deep hollows look well. And the effect of the deliberate manner in which complex mouldings follow one another, line after line, in one of those beautiful geometrical curved forms so wedded to this period, can scarcely be excelled. It is rare to find in Early English work that sudden jerk with which in too many modern examples the graceful flow of mouldings is rudely and unnecessarily interrupted. All generally glides smoothly on, whether in horizontal, vertical, oblique, or curved lines, unless some good reason to the contrary occurs. Perhaps an elegant little leaf or bud hides an awkward mitre, or conceals while it beautifies the junction between two sets of mouldings which would otherwise be ugly, such as often happens in vaulting with ribstruck from different centres. Observe, for instance, how at Rievaulx and Whitby Abbeys the long slender lancet windows have their delicate nook-shafts wisely checked at intervals by bands or zones for purposes of strengthening the joints and binding the different lengths together. Without venturing to go into the question of the respective merits of Early Gothic and Renaissance work, there are some features of the former to which I would wish to draw your particular attention. We never find those poor old barbarians, the early Medieval men of England, disregarding one of the first principles of design, *i.e.*, solidity in the bases and lower portions of piers. But in later styles a column carrying considerable weight is needlessly encumbered with overlaid ornamentation, or sometimes sculpture, half way up. Buildings exhibiting these features are every day rearing themselves in our midst. The early men, on the contrary, put decoration in the right place.

I now come to the Decorated period, the most distinctive and characteristic charm of which is probably the window tracery of the earlier or Geometrical type. Other styles may be searched in vain without a parallel being found as regards this beautiful feature. For the system on which the best Decorated window tracery is constructed was based on correct principles. However much opinions may differ as to some of the remarkable views of Sir Edmund Beckett, there was much truth in what he maintained so stoutly in his clever "Lectures on Church Architecture," delivered some years since. I allude to the advantages of sub-arcuation as compared with the intersection of the arched heads of the light carried upwards into the tracery.

The next phase of the movement, the flowing Decorated, has appealed, and probably will still continue to appeal, to many minds, owing to its extreme grace and elegance, even to the confusion of the better judgment. The leaf-life, or, perhaps I might better say, the tree-resembling manner in which the various parts of the window tracery branch out in every direction in graceful forms,

do not suit stone, the material employed. The treatment might rather suggest that of supple moulded clay, or iron worked with a ready hand. The design of the well-known window in Carlisle Cathedral is very seductive, notwithstanding. Perhaps I may be blamed by some for depreciating the imitation of some architectural features which are certainly beautiful in themselves. I would answer that nothing can be really beautiful unless it is fitted for its purpose in material and other respects.

I have now arrived at the last stage of the Gothic styles,—the Perpendicular, the duration of which was much longer than any of the previous ones. It is difficult to say much about it that has not been better expressed by others. Whatever faults and blemishes exist in these later periods, they excel the handiwork of the earlier in their fittings, such as tombs and monuments, metal-work, screens, bench-ends, and stalls, which had reached a high pitch of refinement. In the roof, the hammer-beams and wind-braces, with rich cornices and colored decoration, angels with outspread wings, sometimes bearing shields with emblems of the passion; or, it may be, in the fan vaulting,—in all these one sees the wealth of Perpendicular resources. But turning to other features, such as the piers to a nave arcade, they are slighter and more subdivided into many members. The capitals are much reduced in depth, and consequently become insignificant and out of proportion with the scale of the building. In fact, they would better suit a rood-screen or a shrine. The early vigor had departed, never to return. In the mouldings and in the carving a like falling-off is observable, which one compares indignantly with Early English, and for reasons I have before explained the abacus had scarcely any projection beyond the bell of the capital. Yet, in stateliness and quiet dignity in proportion, how much is to be learned from the work of the Perpendicular era! The judicious employment, in domestic architecture, of the mullion and transom is one of the great features of this period, and for fenestration on the best and most perfect principles I cannot see how the Tudor practice can be improved upon. In the fully-developed period of the style, it seems to me that in some examples the idea is given that a vast system of panelling, but that some of the panels had to be cut through to admit light. In some of the Late Perpendicular towers of Somerset this is very noticeable. Much art was required to avoid the appearance of the panels looking like windows blocked up, so that in many examples the bad effect of this want of management is patent.

In the colleges at Oxford, where the dignified-looking bay-windows not infrequently take their rise from the ground and mount up to the eaves of the roof, crowned with a rich parapet, or perhaps the picturesque oriel, jutting out over a boldly-moulded archway,—in these features the style fascinates and impresses. To my own mind the most perfect form of oriel is that in which the mouldings are ingeniously devised so as to lead the eye gently down to the solid wall, doing away with any uncomfortable feeling of a top-heavy, insecure structure. In modern architecture attempts at originality have been made, to improve, I suppose, upon the almost invariable practice of our forefathers of the Perpendicular date; but the success is scant, the effect crude and poor. One misses that growing out of the parent stem, *i.e.* the main wall of the building, which its embattled and pretty oriel, should exhibit. The embattled and pierced parapets were, of course, another marked feature in the style, and give great dignity. They also have the practical advantage, in secular and domestic architecture, of enabling the heads of windows to be nearer the ceiling than could be the case with overhanging eaves. I do not say the parapet is only a Perpendicular detail, but that it is more characteristic of it than of Early English or Decorated work. In scarcely any style are the chimneys treated in so stately and successful a manner, each shaft frequently quite distinct in itself, twisted or fretted, adding much to the general ornamental effect.\*

**Competition.**—*Blaina, Glamorganshire.*—Architects were recently invited to submit designs for Town-hall and Market at the above place. Messrs. Wing & Johnson, architects, Abergavenny, are the successful competitors.

\* To be continued.

#### FROM EDINBURGH.

In the new thoroughfare opened up between Spittal-street and Lauriston-place, at its intersection with the West Port, a new Free Church is to be erected, from designs prepared by Mr. H. J. Blane. This church is to supersede the Chalmers Territorial Church in the West Port, which was erected under the auspices of the late Dr. Chalmers, the leader of the Free Church movement, and designed by him for the exclusive use of the *proletaire*. During the latter years of his life Dr. Chalmers seldom, if ever, preached in any other church, and such was the desire of some well-to-do persons to hear the celebrated divine, that it is said the expedient was adopted by them of donning their shabbiest attire, in the hope of obtaining admission to the church. The church is a humble structure, and is defective both as regards lighting and ventilating. The new church will be a handsome and picturesque edifice, costing about 6,000*l.*, and will accommodate a congregation of 950. Owing to the configuration of the ground and the limited dimensions of the site, it has been deemed expedient to place a hall, vestry, &c., on the street level, and these, notwithstanding the slope of the street which runs alongside, are amply lighted. With the view also of securing ample light for the church, the front elevation has been made octagonal, and a small octagonal recess opposite is occupied by the pulpit, which is on the platform class. Externally the church is picturesque in effect and Early Gothic in character, into which the architect has infused some of the peculiarities found in early Scottish churches, this more especially in the spire. The building is thus brought into harmony with one of the old historic localities of the city. A *flèche* is placed over the apex of the roof of the large octagon, and the windows which light the side galleries are carried up as gables.

Mr. Blane has also prepared plans for a small chapel to be erected at Polwarth-terrace, Melville-street, in connexion with the Church of Scotland. It is estimated to cost about 1,500*l.*, and is seated for 300 persons. It is simply treated, having pointed lancet windows and a small *flèche*. The funds for the erection of the church were left by the late Dr. Veitch, one of the ministers of St. Cuthbert's, and a year or two ago a site was secured for it at Gilmore-place, it being expected that the fund would be supplemented by contributions from other sources; but it was found that the bequest was saddled with restrictions as to the use of instrumental music, the posture to be adopted during prayer, &c., which did not meet with general approval, and the site was then disposed of, and a Dissenting church has been erected thereon.

Mr. Blane has also on hand designs for a new oak pulpit, to cost 200*l.*, for St. Paul's, York-place.

We had an opportunity, a few days ago, of inspecting the restorations now in progress at the nave of St. Giles's Cathedral, and they appear to be carried out in even a more thorough manner than what has already been done in the choir, large surfaces of stone-dressing having superseded what, on being stripped of plaster, appeared superficial or decayed. The columns, which support the clearstory, as we formerly stated, were, under the direction of Mr. Burns, cut down to the smallest dimensions, and the surface was channelled with non-descript fluting. These have now been restored to what they were originally, substantial octagons. The aisles having been occupied by galleries, Mr. Burns, with the object, apparently, of giving the sitters therein a better outlook, has heightened the arches of the arcade, and decorated them with plaster mouldings. The arches have been restored upon the old lines, and properly moulded in stone. We observe that judicious use has been made of stones obtained from the building, thus, in a great measure, avoiding the rawness produced by the introduction of new material. In the course of the operations a range of early clearstory windows has been discovered which were filled in with rubble, and built across by the stone vaulting of the aisle, which are high in proportion to the central avenue. The vaulting, when cleared of plaster, was found to be in excellent condition, and has been left *in situ* after being properly pointed. The main vaulting of the nave formed of plaster upon a most substantial wood framing, and as it is in keeping with the style of the interior, and its re-construction in stone would have necessitated the formation of an entirely new clearstory, it has been retained.



The corbels and shafts which support the ribs are to be constructed in stone, and stone has been used in all new mouldings. The central shaft of the Albany Chapel has been carefully restored, and an interesting chapel to the west of the north transept is undergoing similar treatment. The carved boss which formed the central feature of the vaulting of this chapel is at present in the Antiquarian Museum, and it is expected that it will be replaced in its original position. Both of these chapels are to be separated from the aisles by wrought iron screens, and their floors laid with Irish marble and encaustic tiles. The latter of these chapels might appropriately be reserved as a memorial of Dr. Chambers, through whose liberality the restorations are being carried out.

Opposite the north transept of St. Giles's is one of those steep narrow closes which form one of the architectural features of the old town of Edinburgh, called Advocate's close. These closes were built upon the site of the gardens of the houses which faced the main street of the city at a time when it was enclosed by walls, and every available foot of space had to be utilised for building purposes. To make the most of the space, moreover, the buildings were raised to a great height, and many picturesque combinations came about. The buildings in the close in question have latterly become in a discreditable condition, and were condemned by the Dean of Guild Court, and as the proprietor took no measures regarding them they were taken possession of by a set of squatters, who were proceeding to use up the wood fittings of the interior for firewood, some antique mantelpieces having been treated in this manner. These buildings abutted upon the printing premises of the Messrs. Chambers, and as no public official appeared to interfere with the squatters, Dr. Chambers bought up the buildings and proceeded at once to demolish them. In the course of the demolition some carved pillars and architraves with armorial bearings have been removed and laid aside, with the view of their being incorporated in new buildings which are to form an addition to the premises of Messrs. Chambers. It is proposed to open up the close and improve the steep gradient so that it may be used as an additional access from the High-street to the Waverley Station. The close takes its name from the town residence of Sir James Stewart, of Goodtrees, who was Lord Advocate immediately after the Revolution, and who died in 1713.

#### REPORT OF THE COUNCIL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE Report of the Council will be read at a business meeting of the Institute to be held on Monday next, May 1st. We print in advance a few paragraphs from it:—

The number of subscribing members, largely increased during the official year, may be favourably compared with that of preceding years:—

	May, 1878.	May, 1879.	May, 1880.	May, 1881.	May, 1882.
Prof. } Fellows ...	324	339	353	365	370
Members, } Associates	311	341	396	423	69
Hon. Associates.....	839	689	719	797	1,008
	70	106	114	117	113
	709	799	833	904	1,209*

Of the 365 Fellows at the last annual meeting, five have died, three have resigned, and one has ceased to be a member, while 457 new Fellows have been elected; of the 422 Associates, one has died, five have resigned, two have ceased to be members, one has been transferred to the class of Hon. Associates, and eleven have become Fellows, while 2387 new Associates have been elected; of the 117 Hon. Associates, two have died, eight have resigned, and six new Hon. Associates have been elected. The number of gentlemen elected into the three classes of subscribing members during the past twelve months is 349, and of these two have died, and the election of three others is void under the terms of By-law XX.; the nett gain is consequently 305. Seven new Hon. and Corresponding Members have been elected, namely, Baron Henry de Geymüller (Paris), Albert Thomas (Paris), Olivier Rayet (Paris), J. von Egle (Stuttgart), Don Mariano

\* This total includes 41 Fellows who compounded under the old rules, and 53 gentlemen who, elected March 20th, 1882, had not, at the time of making this report, signified their acquiescence in the election.

† Of these, one has since died, and the election of three is void.

Belmas (Madrid), Theophilus Ritter von Hansen (Vienna), and Edmund Constant Serrure (Belgium).

The revenue accounts and balance-sheets of the trust and the ordinary funds for the year ended the 31st of December, 1881, audited by Mr. Wyatt Papworth and Mr. Rickard, are submitted, together with the usual supplementary revenue account, made up to Saturday, the 15th of April, 1882, of the ordinary funds. It will therein be seen that not only the balance of the entrance-fees received for 1881, but all the entrance-fees received this current year, have been invested, as well as a large proportion of the amount now due for the same. The legacy of 100*l.* bequeathed to the Institute by Mr. Decimus Barton has also been invested. The estimate of ordinary income and expenditure for the current year, exclusive of trust funds, entrance-fees, arrears of subscriptions, special receipts and disbursements, is as follows:—

INCOME.	
Annual Subscriptions.....	£3,150
Dividends on Stocks and Shares .....	145
Issue of Proceedings and Transactions—	
Advertisements .....	£120
Sales .....	40
Examination Fees .....	160
	£3,475
EXPENDITURE.	
Rent, gas, and coals .....	£500
Salaries:—	
Secretary .....	£500
Clerk .....	115
Junior clerk and clerks' overtime .....	55
Librarian .....	100
Library clerk .....	50
	820
Office Expenses:—	
Printing, stationery, &c. ....	130
Stamps .....	80
Petty cash .....	30
	240
Housekeeping Expenses:—	
Porter and caretaker .....	75
General .....	90
	165
Proceedings and Transactions:—	
Reporting .....	45
Printing and lithography .....	700
Binding .....	75
Postage and wrappers .....	180
	1,000
Advertisements.....	60
Examination expenses .....	40
Furniture, repairs, hanging drawings, &c., .....	75
Medals and prizes .....	120
Conversations .....	120
Cost to library .....	50
Leaving a balance of .....	285
	£3,475

The first examination held under the By-law which requires all gentlemen, before presenting themselves for election as Associates, to pass an examination, has been attended with unlocked-for success. Twenty-four applications were received and approved by the Board of Examiners; twenty-two gentlemen presented themselves, of whom seventeen passed with credit.

The Council regret to be obliged to put on record that the designs and drawings submitted by students for the annual competitions of the Institute were this year below the average standard of merit, except, perhaps, Mr. Thomas T. Scott's measured drawings of St. David's Cathedral, which were exceedingly good. The works sent in for the Tite Prize, affording a foil for those of last year, were so bad as to preclude the possibility of awarding it, and only one essay was received; but the design for a stone bridge, submitted for the Grissell Medal, was excellent both in conception and draughtsmanship, and its author, Mr. H. Phelps Drew, is entitled to the commendation which his work has obtained.

The Pugin Travelling Studentship has been gained by Mr. Francis Hooper, and the first holder of the Godwin Bursary is Mr. Arthur John Gale. In accordance with precedent the official recommendation for the award of the Royal Gold Medal was this year made on behalf of a foreign practising architect. In 1876 the late M. Duc, architect of the new buildings of the Palais de Justice in Paris, received it; in 1879 it was presented to an archaeologist of cosmopolitan reputation, the Marquis de Vogüé. This year Baron von Ferstel, an Austrian architect of eminence, known to Englishmen by his works, is to receive the Gold Medal, annually given by Her Majesty the Queen to some distinguished architect or man of science of any country on the recommendation which the Institute of Architects is privileged to make to the Sovereign. Thus, in the course of seven years, three foreign and four British subjects have been selected for this gracious mark of royal distinction.

The small special committee of council appointed, in February, 1881, to consider the question of the Royal Gold Medal and report the past history thereof, have not yet completed their labours, and their final report cannot be presented this Session. The report of the special committee on competitions appointed by the Institute is still under consideration, and awaits the decision of the Fellows; the

Council trust that it may be found possible to call a special general meeting in May, just before the *conversations*, when the presence of a large number of non-metropolitan members may render a discussion of the subject valuable in practical results. The special committee on light and air, also appointed by the Institute, are not yet in a position to make even a preliminary report, but important information has already been obtained, and much more is promised, though some time must necessarily elapse before the papers connected with this difficult subject can be issued to members. The committee on professional practice have not had occasion to meet, the various points submitted under this head having been settled by the Council. Nor has it been necessary to summon the Board of Examiners appointed under the 33rd section of the Metropolitan Building Act, 1855, due probably to the large number of certificated candidates for the office of District Surveyor still unbenefited, and the improved character of the statutory examination, which, to be satisfactorily passed, requires varied educational attainments and a great deal of practical experience. The Board will, however, meet this month for the transaction of business and the examination of two or three applicants.

Mr. George Godwin's munificent gift of 1,125*l.* to found a Bursary for the promotion of the study of modern architectural works abroad points to the fact, too much overlooked, perhaps, in the world of art, that something more is required from the architect of to-day than a knowledge, however varied or profound, of past methods of construction, of classical and mediæval styles, or of different phases of their revival. It is impossible not to feel that this suggestion, and the practical means taken to secure its adoption, may eventually prove of the very highest service, not to students only, but to all the members of the Institute. There is no reason to prevent men of mature age from applying to hold the Bursary for a year and returning from America, or from distant European capitals, with valuable memoirs on matters of constructional, practical, or sanitary importance, and such, the Council believe, is the intention of the founder. At the same time, even a very young man, while he would certainly receive benefit from his inquiries, might bring back a description of novelty or modification in methods of building or sanitation, even were he unable to explain the principle or detail particulars of it,—a description which might, nevertheless, be of infinite interest and value to his experienced colleagues and elders at home. It is, therefore, gratifying to the Council to learn that the first holder of this Bursary, Mr. Gale, has arranged to pay his required visits in Paris of the United States, and, while proposing to furnish him with letters of recommendation to colleagues in New York, Boston, and other chief cities, they look forward with confidence to the successful inauguration of a happily-devised scheme for spreading and popularising the science of architecture.

That some similar idea has possessed the advisers of the German Government can hardly be doubted. The proposal to attach an architect to its Embassy in Paris, and also to that in Washington, is evidence of the growing necessity felt in educated Germany for information respecting current systems of design and construction practised at a distance from home. It remains, therefore, for the architects of all civilised communities to assist and support international inquiry of this description; and members of the Institute will do well to remember that what among foreign nations is often done solely by the Government must in this country be effected by private enterprise and even individual exertion.

#### CRYSTAL PALACE SCHOOL OF ENGINEERING.

ON Saturday, the twenty-eighth term of the school, which opened in January, 1873, was closed, by the inspection of the drawings and work of the students, the delivery of an address by the chairman for the day, and the presentation to the students of the certificates awarded by the examiners. Professor W. E. Ayrton, F.R.S., C.E., presided, and the examiners on this occasion were Mr. T. Sopwith, M. Inst. C.E., and Mr. E. B. Martin, M. Inst. C.E. The fall complement of students,—sixty,—were present during the Colonial session, were in attendance during the term. After the numerous visitors had made the tour of the drawing-office and the workshops of the school in the south tower of the Palace, an adjournment was made to the lecture-room, where Professor Ayrton addressed the company.

Mr. Shenton, superintendent of the School of

\* We hope to be excused for quoting this part of the Report, on the ground that it is most desirable that the object of the foundation should be fully and widely known. It is to be hoped that some other members of the Institute may be led to establish similar Bursaries. We shall have to wait too long for desired information if we have to depend only upon one appointment annually. The German Government, by their action, following on the establishment of the English Bursary, have recognised the importance of the movement, and have appointed, we are informed, not one but several architects to proceed at once to various countries.



Art, Science, &c., having read the Examiners' report, the certificates were presented. The lectures for the term have been on "steam." They were attended by twenty-seven students, of whom twenty-two were eligible for examination, and nine passed satisfactorily. The highest number of marks obtainable is 273, which has been gradually raised from 230. Mr. C. A. Hitchings was first with 220 marks, and was also first in order of merit for work in the fitting-shop. Nine certificates were awarded for work in the drawing office, Mr. T. C. V. Zubiria, a Spanish gentleman, we believe, being first in the order of merit. Mr. Zubiria's name was greeted with a round of hearty applause by his fellow-students, as were those of Mr. Branton, a young man of colour, and some others, who seemed objects of admiration or sympathy from their youthfulness or other cause. In the pattern-shop nine certificates were awarded.—Mr. J. R. Pratt first.

On the motion of Mr. D. Thompson, C.E., a director of the Crystal Palace Company, thanks were voted to the chairman for his address, and to the examiners for their valuable services. The examiners confirmed verbally the favourable terms of their reports. Mr. Sopwith took exception, however, to some of the students' papers as not so cleanly, tidy, and neatly written and tabulated as they ought to have been; the drawings he considered highly creditable, and his duties in the examination had given him very great pleasure. Mr. Martin referred to the increasing demand for young men in the engineering profession who were fit for work. The greater part of the work he had examined was highly creditable; but, if all the students had given their entire minds to it, it would have been better,—

"Most pains often best most brains."

Mr. Wilson, the principal, was called upon, and referred with pleasure to the presence of Mr. Percy Britton, one of the first pupils of the school, who had set an admirable example to his fellow-students in application and diligence; his work had never been surpassed. The result was that he had risen rapidly in his profession. Mr. Wilson also bore high testimony to the merits of student H. Skinner, who had earned the highest honours possible in the school. He concluded by publicly thanking his assistants, who were all, in efficiency and attention, that he could desire. He announced that a goodly number of fresh students had arranged to join the school next term.

#### CHURCH OF THE SAVIOUR, MOSCOW.

THE vow of the Emperor Alexander I. to erect a church in honour of the Saviour at Moscow, as a memento of the liberation of Russia from the French, was left to his two successors, Nicholas I. and Alexander II., to fulfil, a duty which has now been performed, though not quite in the manner in which Alexander I. desired the building to be carried out. That monarch had confided the erection to Karl Wittberg, a painter, whose fantastical plans found great favour with the emperor. The foundation-stone was laid on the Worowjeff heights, on October 17, 1817, the day on which, five years previously, the French evacuated Moscow. The selection of the site turned out to be a very unfortunate one, the loose soil of the spot being little suited for such a vast building as it was contemplated to erect there. Disregarding the objections and scruples of experts, Wittberg—who had very hazy notions as to the form and the dimensions of his building,—persevered with his work, bent upon the realisation of his ideas, until the death of his imperial patron led to a cessation of the works. The labour of ten years had involved the expenditure of 16½ million roubles (nearly 2½ millions sterling).

The Emperor Nicholas I. gave orders to the architect Thon to prepare new plans, and in September, 1839, he laid the foundation-stone of the edifice, which has only now been completed. St. Saviour's Church, Moscow (which we illustrate in our present number) is built in the form of a Greek cross, and has an elevation of 344 ft. 6 in., the materials employed being only stone and metal. The marble walls and gilded domes and crosses would have had a very monotonous effect if the sculptor's art had not been called in to adorn the building. Numerous sculptures, by Baron Klodt and Professors Logansky and Ramazanoff, embellish the exterior. The anniversaries of memorable battles during the War of Liberation are represented by the

various saints of the Greek Church whose feasts coincide with the days of the battles. Thus the Battle of Leipzig (October 7, O.S.) has its representative in St. Sergius, that of Kulm (August 18) in St. Laurus. But, according to the view of critics, the high-reliefs have no claim to great artistic value.

In contrast to the comparatively plain exterior, the interior of the church is extremely gorgeous in colour. The numerous paintings and frescoes, for which over a million roubles has been expended, are the work partly of deceased masters, such as Bruni and Neff, partly of young painters of more recent times, so that there prevails in this respect a certain amount of inharmoniousness of colour. The five towers contain no fewer than fourteen bells, the largest one of which has a weight of nearly twenty-eight tons. The expenditure for the new building, up to the year 1869, amounted to nearly ten million roubles, and from a calculation then made it was estimated that a further six million roubles would be required during the next twelve years to complete the edifice. It is no exaggeration to say that the total cost of the church is twenty million roubles (three millions sterling).

#### SCIENTIFIC AND TECHNICAL EDUCATION IN BRISTOL: THE MERCHANT VENTURERS' SCHOOL.

THE Society of Merchant Venturers of Bristol, the only remaining Trade Guild of that city, has lately entered into a contract for erecting buildings on a large scale upon ground formerly occupied by the Bristol Grammar School, and the works will probably be finished early in 1884, at a cost of more than 30,000l., in addition to that of the site. The buildings when completed are intended for the use of the Bristol Trade and Mining School.

This school, which was founded more than a quarter of a century ago, and was one of the first in England to undertake the systematic teaching of science, has gradually become a many-sided and comprehensive institution.

Receiving boys at the age of nine years, it first passes them through the elementary course, which is the common groundwork of all branches of higher education, and then offers them the choice of a thorough commercial training or of a preparation on its scientific side, for pursuits connected with manufactures and the constructive arts. Its mining department deals with the sciences required in mining and engineering, and it has a chemical laboratory for the study of practical chemistry, analysis, and assaying, which is open to others besides members of the school.

The evening classes form one of its most important features, and provide courses of instruction for pupils of all ages in high mathematics, applied science, classics, modern languages, and other subjects of practical utility.

Though limited in numbers, owing to the meagreness of its present habitation, the school has within the last ten years gained twelve of the sixty royal scholarships which the Science and Art department of the Committee of Council on Education has during that period offered for open competition throughout the United Kingdom; and it has also carried off many scholarships and exhibitions at Oxford and elsewhere. Its distinguished career up to the present time has suggested to the Society of Merchant Venturers the idea of developing it further, and the possibility of its forming the nucleus of a great school of scientific and technical education for those who in the future will be engaged in the various commercial, manufacturing, mining, and engineering industries of the West of England.

No pains are being spared in the endeavour to obtain buildings thoroughly adapted to the realisation of this idea, and visits of inspection have been paid by representatives of the Society and by its architect, Mr. Edward Cookworthy Robins, F.S.A., to the newest and most important schools and colleges, both at home and abroad, devoted to teaching of the kind intended. We understand that Mr. Robins is about to read a paper before the Surveyors Institution on "English and Foreign Technical Education Contrasted and Reviewed from a Professional Standpoint."

Ample accommodation will be found in the new buildings for the Trade and Mining School in all its branches, with due allowance for its expected growth, and a very considerable addi-

tion to its usefulness will be secured by the provision of a complete equipment for laboratory repetitions and investigations, and for the experimental study of the applications of theoretic teaching to workshop practice.

There is every reason to hope that the Society's confidence in the success of its undertaking will be justified to the fullest extent, and that the school which henceforth will be associated with its name will prove a worthy rival to the most magnificent establishments founded in the metropolis by the wealthier companies of London.

The building occupies a site at the corner of Unity-street and Denmark-street, in the rear of College-green, not far from the cathedral, and will be four stories in height.

On the topmost floor are situated the chemical, physical, and metallurgical laboratories and lecture-rooms; the combustion, balance, special operation, and master's rooms, with an observatory in the turret marking the position of the chief entrance.

The first floor contains the engineering lecture-room and mechanical and geometrical drawing schools; also a series of four general classrooms, all opening into the gallery of the great examination hall.

The ground-floor comprises a similar series of class-room, about 25 ft. square, entered from the great hall aisle or open corridor.—Mr. Robins having applied to this building the principle of planning recommended in his lecture at the Society of Arts in 1881, on "Secondary School Buildings," and termed by him, at the suggestion of Dr. Abbott, "the hall passage system." Beyond the hall and class-rooms are the library and museum, the waiting, committee, and master's rooms, with the usual lavatories and conveniences.

The basement, which (owing to the situation of the building on the slope of the hill in Unity-street, connecting College-green with Denmark-street) is level with Denmark-street at the east end, and two-thirds below the level of Unity-street at the west end, comprises engineering workshops and testing-rooms, cloak-rooms, lavacoon-rooms, and kitchen offices complete, engine and hot-water apparatus rooms and coal and fuel cellars.

Over the caretaker's apartments, east of the boys' entrance, is a freehand drawing school with northern light.

The boys' conveniences are external to the building, and the sanitation has received the attention likely to be given to it by the author of the paper read before the Institute of British Architects on the "Relations of Sanitary Science to Civil Architecture."

Messrs. Bacon & Co. will execute the heating and ventilation upon the principles laid down in that paper, and the electric light, and the transmission of power by the electric current, are likely to find a field for its application to the various appliances contemplated.

There are two staircases, the principal stairs being of hard Massa Carrara marble, and effectively accented.

The style of the building is fourteenth-century Gothic, the exterior being faced with the Cattybrook Company's red pressed bricks, with Pictor's best Box ground dressings, and green slating.

The interior of the hall is of a later period, and is lined with oak panelling and fan-traceried ceiling, designed to overcome the otherwise flat surface thereof.

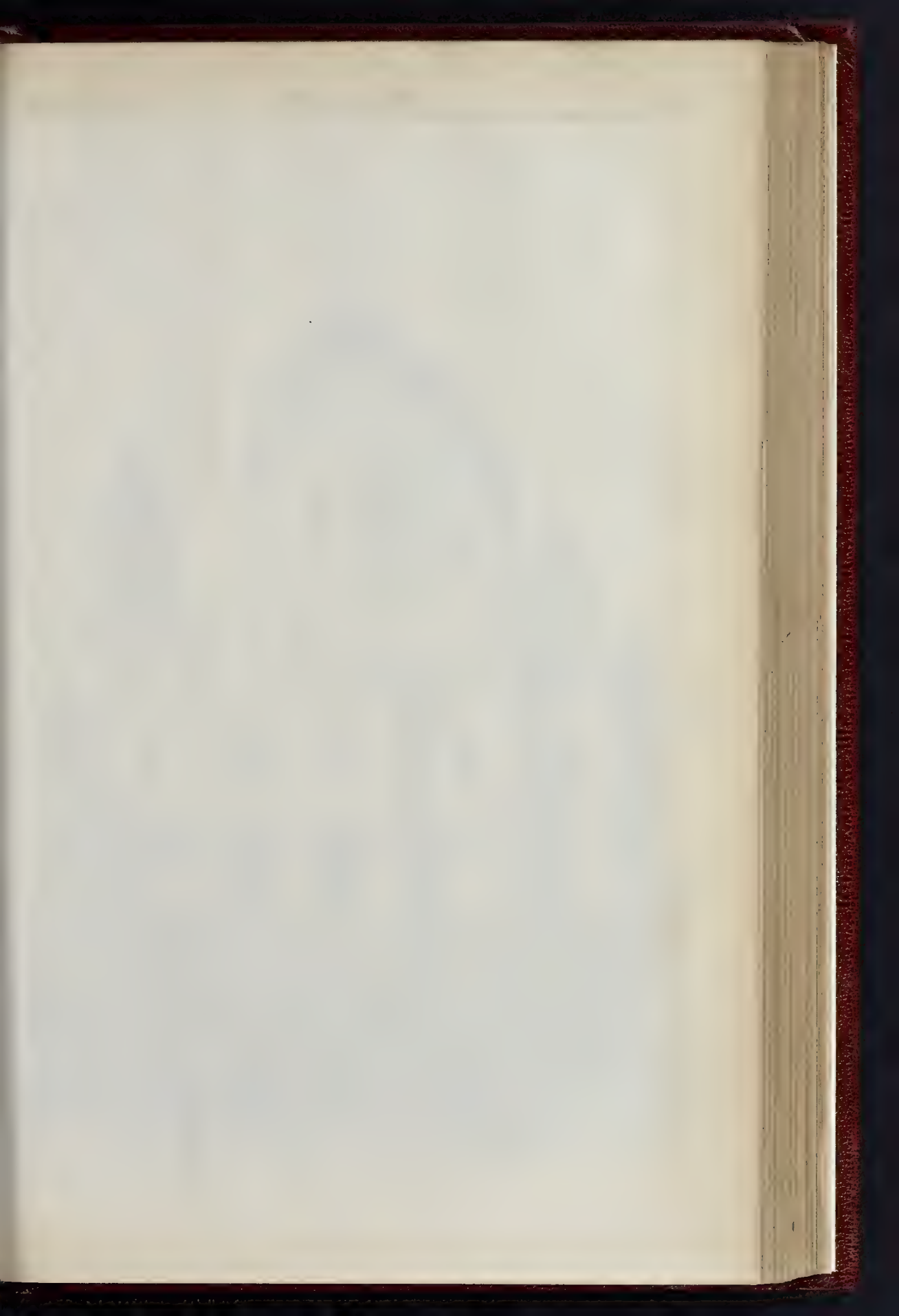
The open corridor arcade is of Portland stone. The organ shown is not intended to be constructed, and is merely a suggestion.

The library and museum is decorated in keeping with the hall, which, with the corridors and staircases, are faced with water-faced red bricks and Corham stone dressings.

Under the freeroof floor of the great hall is the covered playground, communicating by arches with the open playground occupying the space in the rear of the L-shaped building. Messrs. Brock & Bruce are the contractors, and Mr. Withycombe is the clerk of works.

**Matlock Bath Water Arbitration.**—The arbitrators were Mr. H. Roper, C.E., and Mr. G. B. Nichols, C.E., the umpire being Mr. Wm. Batten, C.E. The statement of value made by Mr. Nichols of the Waterworks Company's undertaking, to be transferred to the Matlock Bath Local Board, amounted to a total of 1,763l. 0s. 8d. Mr. Roper's valuation amounted to 2,759l. 7s. 6d. The umpire's award amounted to 1,907l. 10s.

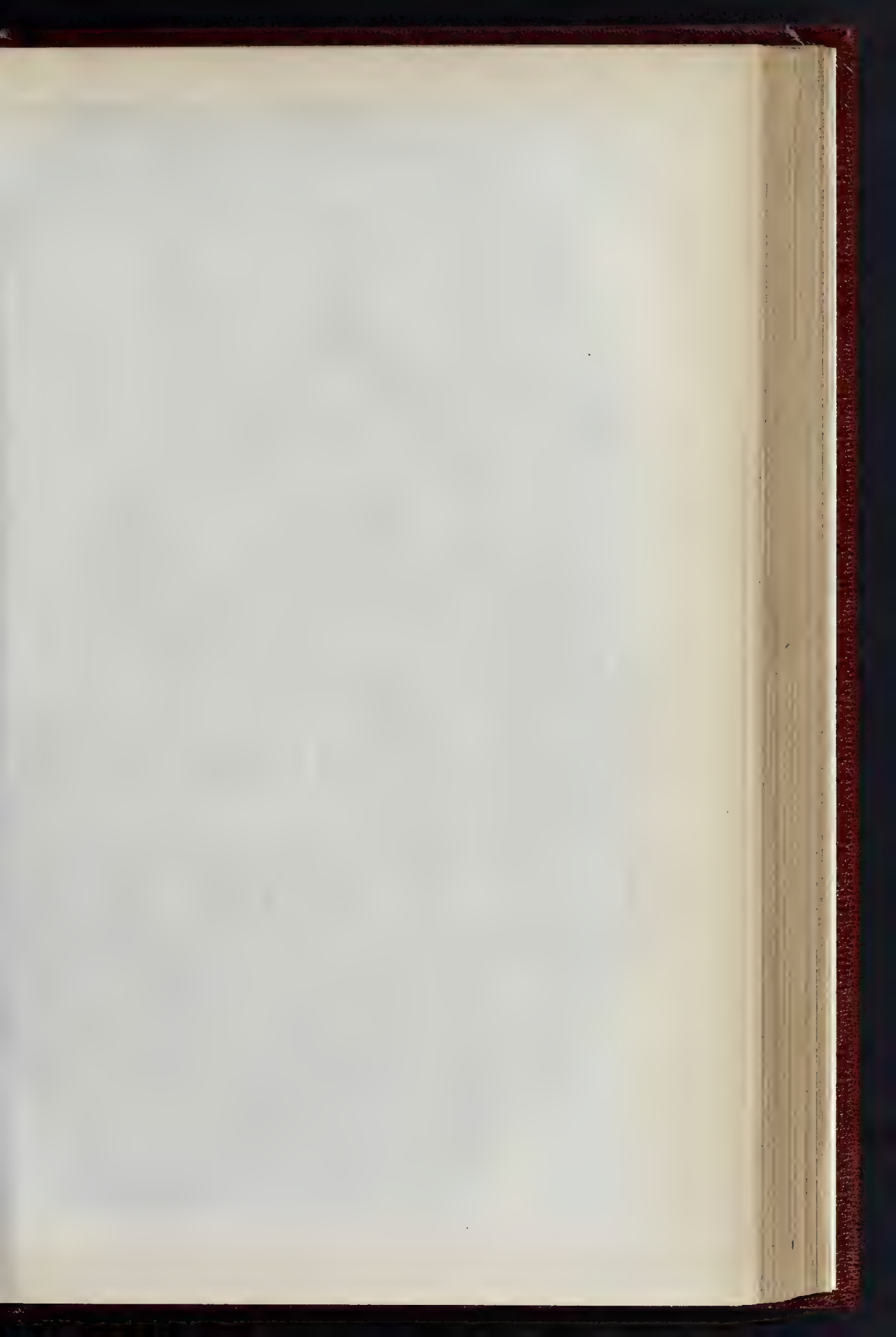






CHURCH OF THE SAVIOUR, MOSCOW.—M. THON, ARCHITECT.

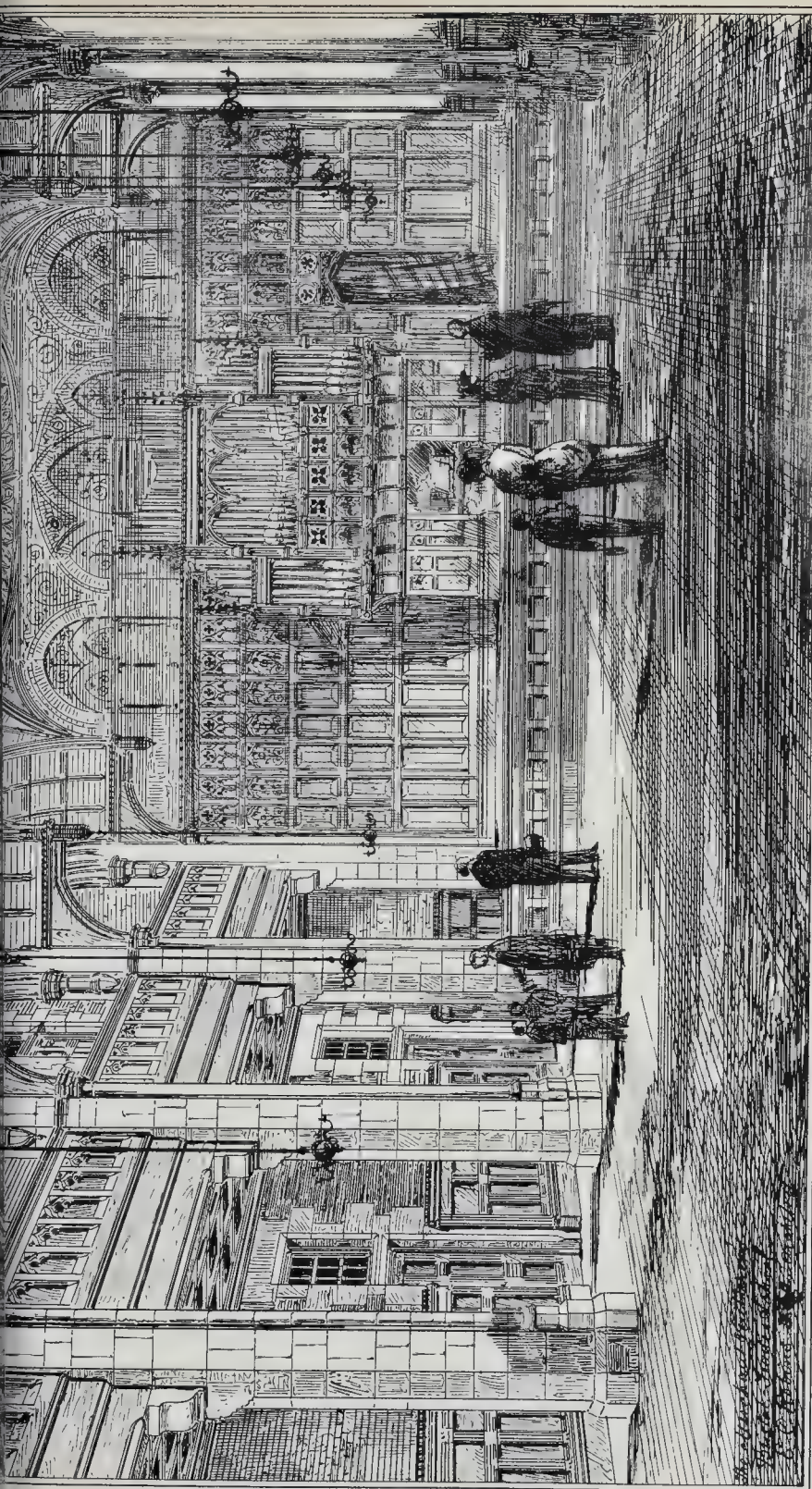




THE BUILDER, APRIL 29, 1862.







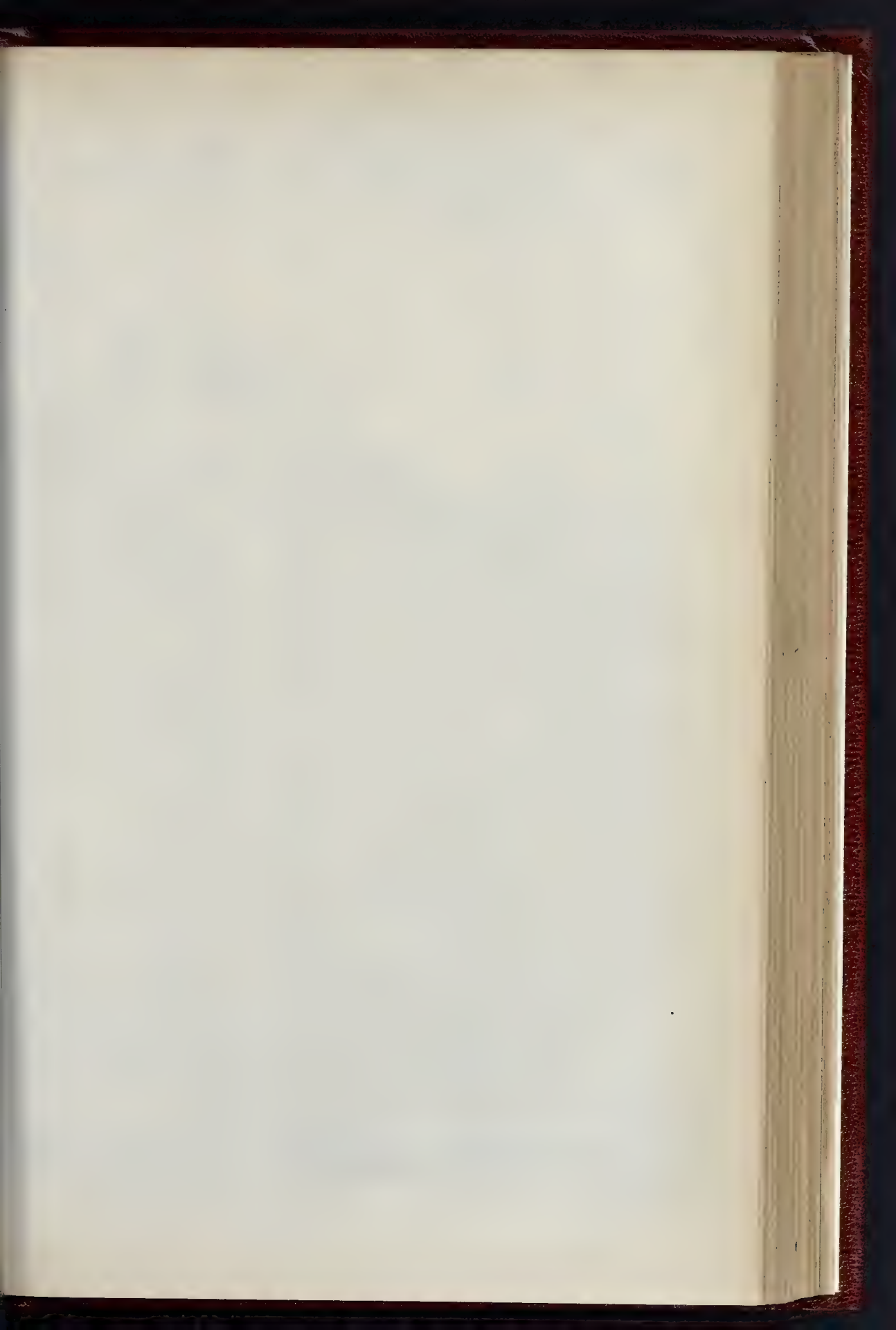
MERCHANT VENTURERS' SCHOOL, BRISTOL.  
INTERIOR OF GREAT HALL.

Photo. Lithographed by James Alderman & Sons, 11, Queen's Square, W.C.

By J. H. W. P. 1874. D. 1874. D. 1874.







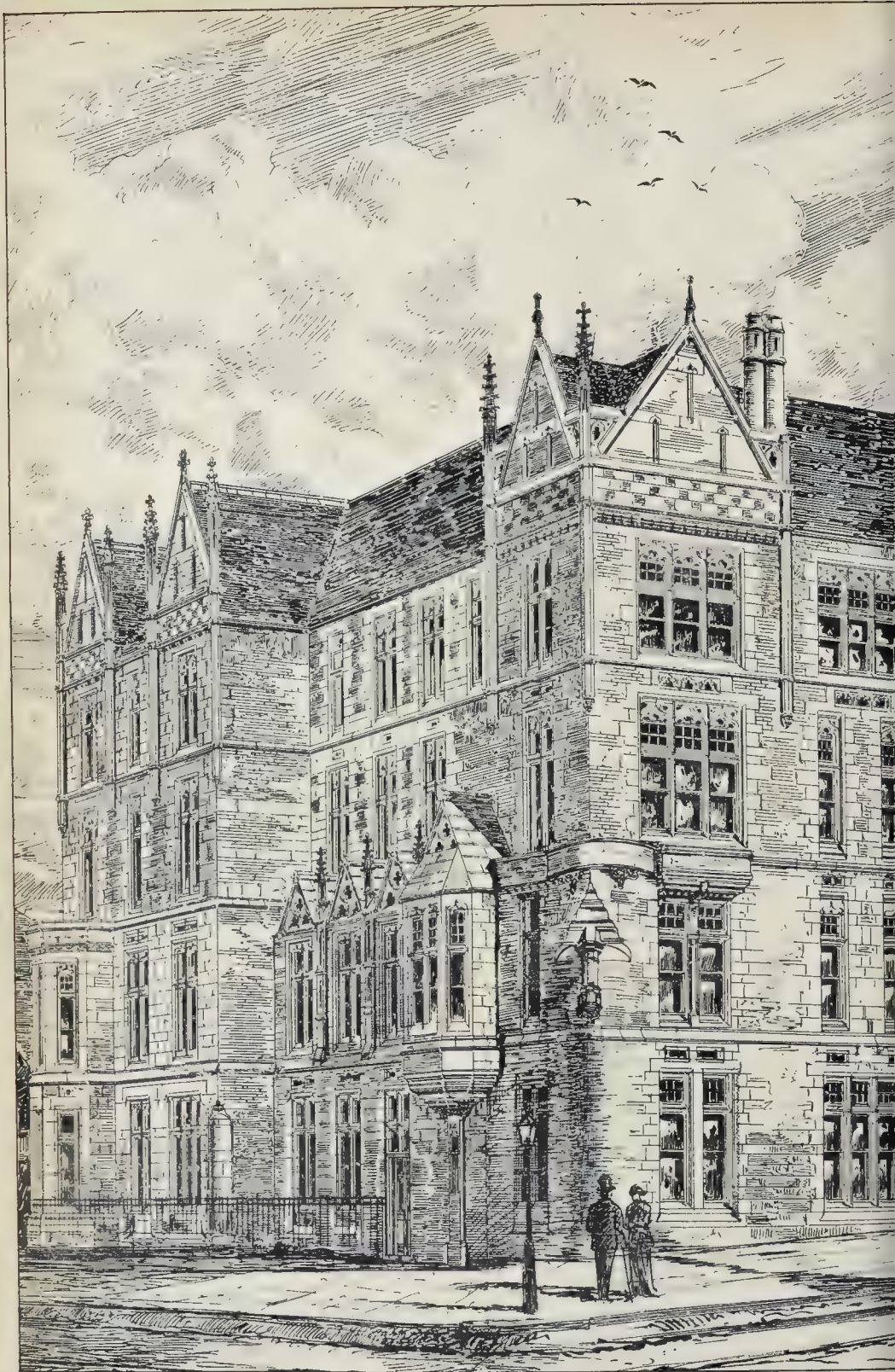


Photo Lithographed by James Auerman to Queen Square W.

MERCHANT VENTURERS' SCHOOL,





—MR. E. C. ROBINS, F.S.A., ARCHITECT.

WINDMAN & SONS, PRINTERS, 15, N. B. ST.







GROUP ILLUSTRATING THE INTERNATIONAL POSTAL UNION, GENERAL POST-OFFICE, HANOVER.

HERR W. ALBERMANN, COLOGNE, SCULPTOR.

#### A POST OFFICE MONUMENT.

GENERAL POST OFFICE, HANOVER.

The group which we illustrate in this week's *Builder* adorns the eastern cupola of the new General Post Office at Hanover. It was cast in bronze by Messrs. Richard Roehll Nachfolger, Cologne, and is intended to represent the International Postal Union. The group was modelled by the sculptor W. Albermann, of Cologne, who designed, besides various war-monuments at Lefeld, Elberfeld, Neuss, Solingen, and others, the great group of caryatides of the Rathhalle at Düsseldorf, and the group in the interior of the Ständehaus there. The group which we illustrate is 20 ft. high. Its base is

formed of a globe of 6 ft. 6 in. diameter, resting upon a slab of 1 ft. 6 in. in thickness. The globe is surmounted by a winged female figure, 11 ft. 6 in. high, representing the International Postal Union, extending her right hand protectingly over the world, and holding letters in the other. Two genii in a flying position are placed on the sides of the globe, carrying in their hands lightning, telegraph-poles, a torch, and a railway-wheel, thus indicating the connexion of the post with telegraphy and its influence upon commerce. The group, which is considered masterly both in design and execution, shows to what uses zinc may be applied for decorative purposes. A small model of the group has been placed in the Post Museum at Berlin.

#### ARCHITECTURAL ASSOCIATION.

At the meeting of this Association on the 21st inst., Mr. Aston Webb, President, in the chair, it was announced that the late Mr. Edmund Sharpe, besides leaving a very valuable bequest of books to the Association, bequeathed a very large number of drawings. These, which collectively weighed about 2 cwt., contained a great variety of mouldings and other details, besides an invaluable collection of plans, &c., all of which had been made by Mr. Sharpe himself from time to time, either for the purpose of the works which he published, or in connexion with lectures which he had given to the Association and kindred societies. The draw-





ings had now been submitted to the Library Committee of the Association, and they would be collated with a view to their exhibition in the course of next session. On the motion of the Chairman, a vote of thanks was passed to Mr. Sharpe's son for forwarding the parcel.

Mr. A. B. Pite presented the following requisition to the President and Committee of the Association:—

We, the undersigned members of the Architectural Association, are impressed with the necessity of forming a class, under the provisions of Rule IV. of the Association, for "the special study of Medieval Architecture and its accessory arts," and humbly desire your sanction to the formation of such a class.

It is unnecessary to state that members who are anxious to study the architecture of our own country have, at present, no authorised opportunity of uniting for such a purpose in connexion with the Association.

We confidently expect that the benefits such a class will offer will largely be appreciated, and its influence for the good of our art indisputable.

We propose inviting Visitors to conduct and preside at the meetings in the Elementary Class of Design, to assemble one Wednesday in each month next session to study, by means of existing examples, the useful and ornamental arts of the Middle Ages, paying special regard to the principles of construction and design, care being taken to prevent the class from degenerating into mere antiquarianism, and to the Classes of Design and Colour Decoration. The sum of 5*l.* has already been subscribed towards prizes for the first session's work.

Believing that this effort to foster enthusiasm for our art, by offering facilities for the special study of English Mediaeval architecture among our students, will further the highest objects of the Architectural Association, we are, Mr. President and Gentlemen, your obedient servants,

ALFRED WATERHOUSE. JOHN L. PEARSON.  
JOHN BELCHER. J. OLDRIE SCOTT.  
T. R. SMITH. JOHN P. SEDDON.  
THOS. BLASHILL. ERNEST C. LEZ.  
L. C. RIDDETT. R. PHENE SPIERS.  
HUGH STANNUS. HUGH RODMUE GOUGH.  
WILLIAM WHITE. THOS. GARRATT.  
WM. HENRY BOVILL. RICHARD C. PAGE.  
SYDNEY VACHER. GILBERT R. REDGRAYE.  
S. FLINT CLARKSON.

Mr. Pite added that Mr. Seddon had consented to become President of the Class.  
Mr. B. Edmund Ferrey then read a paper the first portion of which we print in other columns.

#### ART-UNION OF LONDON DISTRIBUTION.

The forty-sixth annual meeting and prize-distribution of the Art-Union of London was held on Tuesday, in the Adelphi Theatre, by the kind permission of Messrs. Gatti.

Mr. George Godwin, V.P., presided, in the absence of the President, Lord Houghton, who wrote from Fryton Hall, Ferrybridge,—"I am here, gradually recovering, but am forbidden to attend any public meetings at present, so fear I cannot preside at your anniversary."

Mr. J. A. Hallett, member of the Council, read the annual report, some portions of which we print:—

"The Council have to announce the sum of 13,927*l.* 4*s.* as the subscription of the year now closed. The accounts of the year have been audited by Messrs. Hicks & Stead, to whom thanks will be forthwith proposed.

The following is a brief summary of the receipts and expenditure; a detailed account will, as usual, be printed in the report.

Amount of subscriptions .....	£13,927	4	0
Alotted for prizes .....	£3,228	0	0
Set apart towards providing works of art for accumulated payments .....	614	12	0
For print of the year, almanack, exhibition, report, and reserve .....	6,739	9	10
Agents' commission and charges, advertisements, printing, postage, rent, &c. ....	3,345	2	2
	£13,927	4	0

It was, of course, inevitable that the large amount expended in the production of the remarkable set of prints, "The Road to Ruin," should occasion a very large deduction from the amount available for prizes.

To the Local Honorary Secretaries and Agents in all parts of the world the warm thanks of the Art-Union are due. Conspicuous amongst them is Mr. Wright, of Adelaide. Mention must also be made in the same spirit of Mr. Hassé, Leeds; Messrs. Grundy

and Smith, Manchester; Mr. Nott, New Southgate; and Mr. Neilson, Paisley.

The amount to be expended on prizes will be thus allotted:—

1 work at .....	£100	.....	£100
2 works at .....	75	each	150
3 " .....	60	"	180
4 " .....	50	"	200
5 " .....	45	"	225
6 " .....	40	"	240
7 " .....	35	"	280
8 " .....	30	"	240
9 " .....	25	"	225
10 " .....	20	"	200
15 " .....	15	"	225
20 " .....	10	"	200
			£2,340

10 China Tazas.  
50 Framed proofs, "Countess of Bedford."  
100 Sets of Designs from English History.  
30 Silver Medals of E. H. Baily, R.A.  
80 Portfolios of 24 Plates of Animal Life.

Making, with the prizes given to unsuccessful members, 558 prizes.

There are not many exhibitors on the walls of the Royal Academy whose works excite more interest than those of Mr. John Bagnold Burgess, A.R.A. Born of a family of painters, he may be cited as a living argument in proof of the theory of hereditary transmission of genius. His great-grandfather, Thomas Burgess, presided over that art-school in Maiden-lane, Strand, which numbered Gainsborough amongst its pupils. A portrait by the son of the same Thomas Burgess excited much commendation and inquiry a year or two ago, in the exhibition of old masters, and other members of the family exemplified the general tendency. The subject of the present notice, after gaining the Royal Academy medal of the first class for drawing from the life, began the attempt to establish himself on an artistic footing by painting portraits; but his poetic and imaginatively distinguished nature soon sought another sphere, and, taking advantage of certain family connections residing in Seville, John Burgess went off to Spain, and he became so completely imbued with the tone and temper of the country, as fully to justify the assertion of his admirers that on whom, from the *torero*, he most frequented, we used to call Philip of Spain. The work by which, at a bound, John Burgess established his reputation was a picture entitled "Bravo Toro," a most characteristic episode in a bull-fight, powerfully delineating the various emotions called forth in the bull has particularly distinguished himself. This picture was exhibited in 1865. In 1868 another picture on the wall of the Royal Academy attracted great attention. In a low Spanish posada, the rendezvous of thieves and gipsies, a barber and another of the gang are giving a lesson in dancing to a pretty little girl, evidently kidnapped from some family of distinction, two of the men being engaged, in the background, in examining the ornaments of which they have rifled the little maiden. The situation makes a strong appeal to the sympathy of the spectator, the object of her capture being, no doubt, to make money of her performance of the accompaniments which they are seeking to cultivate.

The keen repulsiveillery expressed on the countenance of one of the men—a sleepy acquiescence of an old fellow smoking his pipe—the trouble and amazement in the face of the poor little victim, and the compassionate look of a gipsy woman, who has a child of her own and feels for the lonely little girl,—and, not least, the mischievous, rollicking gestures of the boy on his back in the foreground, all present remarkable studies of character and expression. The two old men playing cards, too much absorbed in the game to pay much attention to the passing scene, are life-like in their way. The few inches of canvas in which much of the interest of the story is concentrated, and which may, at first, almost escape notice, show the heads of two gendarmes, followed, no doubt, by others, descending the staircase, sweeping down to rescue their prey from these vagabonds. What a relief does the appearance of these men in commonplace ooked hats bring to the tension of our feelings,—how sad was the notion that this pretty child, torn from her home, should pass her life as the slave to this vile crew,—and how great the satisfaction that she is just going to be released and restored to her friends, the other actors in the scene being handed over to the attention of the public prosecutor. A fine engraving from this picture, begun by Mr. Chas. Jones, and finished, since his death, by Mr. Lumb Stocks, R.A., will be our presentation work for the coming year.

In the summer of last year a very complete and comprehensive exhibition was held in Bolton for the benefit of the new infirmary in that town, and amongst was Mr. Selim Rothwell, a water-colour artist of wide reputation. To his exertions in connexion with this undertaking is greatly to be attributed the acceleration of his death, which occurred somewhat suddenly in August last. The Art-Union was indebted to Mr. Rothwell for active support and substantial aid during several years in Bolton and its neighbourhood, and a selection of bronzes and

other works were lent for the exhibition above named. Italy, Normandy, and Brittany were the chief sources of material for Mr. Rothwell's pencil, and the charm of his drawings was widely acknowledged. He was one of the early members of the Manchester Academy of Fine Arts, and took an active part in the management of its affairs.

On the 14th day of December died an old and eminent member of the architectural profession, Mr. Decimus Burton. It is the frequent fate of architects to undergo sore disappointments in the alteration or mutilation of their cherished designs, and one of the hardest trials Mr. Burton had to bear was the disfigurement of his arch by the imposition of a colossal equestrian statue of the Duke of Wellington, and that, too, placed, contrary to all classical precedent, across, instead of parallel with, the roadway spanned by the arch. In vain did Mr. Burton protest against the disfigurement of his beautiful edifice,—in vain Viscount Canning wrote, in his official capacity, from the Office of Woods and Forests,—in vain remonstrances went up from all the eminent architects or artists who had been consulted on the subject,—all was to no purpose; the arch had been, so to speak, engaged to the statue seven years before by Lord Melbourne, and the allowance was ratified by his successor. But "the whirlwind of Time brings about his revenges." There is now a proposal on foot for effecting the removal of Mr. Burton's arch further back, so as to give sufficient space for the congested traffic,—and, if the Wellington statue must thus necessarily come down, it is to be hoped that a sense of fitness will lead to its being placed on an appropriate pedestal in a more suitable position. The Athenæum Club House was one of the finest works of Mr. Burton.

The 18th instant saw the death of a man who in a pre-eminent degree set his mark on the condition of art in England of to-day. About the year 1845 Henry Cole,—then a clerk in the Record Office,—feeling strongly the degraded status of the arts of manufacture and design in this country, set himself the task of elevating them. He was foremost in originating a series of art-manufactures,—contributing many designs himself, and, with the aid of the Society of Arts, he organised a series of exhibitions for the purpose of stimulating public industry and invention.

In chronicling the events of the year we must not pass over one which was a source of great gratification to this Council,—the presentation of the Royal Gold Medal of the Institute of British Architects to Mr. George Godwin,—on whose claims on the Art-Union it is unnecessary to enlarge. In presenting the medal Mr. Street, the chairman, took occasion to remark that, unlike other decorations, the award of this medal was the more honourable, that the opinion of his fellow-members of the Institute is taken as to the fitness of its recipient, and her Majesty, unless she sees reason to the contrary, confirms and ratifies the selection made by them. Mr. Street referred particularly to the work of Mr. Godwin's life in connexion with the editorship of the *Builder*, which he had conducted nearly from its foundation, making it, in fact, what it is,—and the chairman said that, "in avoiding the pitfall of producing merely a professional organ, Mr. Godwin had conferred a distinct benefit on the profession. With a much larger sense of what was really for the good of our art, Mr. Godwin has made the journey, whilst it is always ready to devote itself, with zeal to architectural questions, never does so to the prejudice of, or in forgetfulness of, those without whom we should not exist,—those who do us the honour to put their work into our hands. Amongst his chief objects have been the crying evil of bad drainage, bad ventilation, and bad building, especially as they affect the condition and happiness of the labouring classes. To Mr. Godwin as one of the pioneers of progress in such really vital work no small honour is due."

It is a matter for congratulation that there has been no cessation in the past year in the forward movement for establishing centres for the promotion of the study and cultivation of art in this country.

On the 19th of July last the Mayor of Birmingham laid the inscription stone of a pile of new buildings in Congreve-street, which are to include the Corporation Art Gallery, the collection of paintings and objects of art of the city having been temporarily exhibited at Aston Hall. It will be remembered that last year Messrs. Tange made an offer of 5,000*l.* for the purchase of additional objects of art if the Corporation would at once take measures for providing an art-gallery commensurate to the wants of the town, and 5,000*l.* more if a similar sum were raised by public subscriptions. The ground-floor of the building will form commodious offices for the use of the Gas Committee, while the whole of the first floor will be appropriated to art-galleries,—of which there will be six in all,—the area of wall-space altogether amounting to 12,208 superficial feet, besides one gallery, 98 ft. by 53 ft., to be set apart for an industrial museum.

At Llandudno there has been established the Cambrian Academy of Art,—that locality being selected from its contiguity to Betws and other sketching centres in the valley of the Conway.

At Stafford, a fine building has been opened for Corporation from the designs of Mr. McCallum, the borough surveyor.



At Wolverhampton, a munificent offer has been made by a private individual to erect a building for an art-gallery at a cost of 5,000*l.*, conditionally on the town providing a site for the same. When promises to the value of 10,000*l.* are obtained, the donor, who stipulates that the mayor will not divulge his name, will be prepared to begin the building.

In the course of last autumn the Chiswick School of Art was established on the Bedford Park Estate, Turnham-green. On the occasion of opening the school, Mr. Beresford Hope, who presided, observed that it was started under very exceptional advantages, and was likely to take a foremost place amongst its brethren. In the course of his remarks, Mr. Hope said that the drawing or model produced by a student had its value, but that was as nothing compared with the value to the student of exercise of his mental and moral faculties which the production of the model or drawing necessitated. Such exercises would bring home to the mind of the pupil, as nothing else would do, that great divine law of proportion, which governed all things, and was at the bottom of all things, moral, metaphysical, and material. Was not the virtuous man the man who had all his qualities in due proportion,—the wise man, he who had his reasoning powers in due proportion; the wit, he who had a knowledge of grave and gay in due proportion; the poet, he who had a knowledge of things seen and things unseen in due proportion? There was no royal road to art. Perfection could never be reached without assiduous study, constant thought, and constant striving after improvement. Mr. Hope exhorted his hearers to set to with a hearty spirit of goodwill, good temper, and a good-humoured though dogged determination to succeed in the race.

After the glance we have thought it right thus to give at the progress of art in the provinces, we should fail in our duty if we omitted to notice a most important step in advance which has been taken by the fountain-head of instruction,—the Royal Academy. Sir F. Leighton, in his address at the annual banquet, announced a most important revision and extension of their scheme of education. It is sought to add to the means of study brought within reach of the students of this country, and to add incentives to their zeal, by a discriminating increase of the prizes offered, and, at the same time, to exercise a vigilant control over their labours with the object of ascertaining that the advantages provided are not squandered or thrown away. Keeping constantly in view the fact that it is the function of an Academy to foster art and not to multiply artists,—to check as well as to encourage,—to prune as well as to graft,—to see that the idle, or the inept, do not cumber the floors of schools, meant for the gifted and the industrious. It has therefore been resolved to hold, at the end of the first three years of studentship, an examination, the result of which shall determine whether the studentship is bearing fruit and shall be prolonged, or is barren and shall cease. A long-deplored want will be supplied by the institution of a separate school for modelling under a special curator. Instruction will be provided for young sculptors in the practical modelling of ornament as applied to architecture; the sisterhood not of those two only, but of all three arts is acknowledged, by the access offered to each and all of the schools, whatever their special character. A considerable increase has taken place in the rewards offered for the study of the human form from the living model,—a study which lies at the root of all high artistic excellence and achievement. A prize, again, is offered for the reproduction of a study from the life in line-engraving,—a delightful branch of art which, in this country, now struggles, with scant success, to exist. Due homage, again, is done to the prominent place held in modern art by landscape, by the addition of a scholarship to that prize which we owe to the generosity of the greatest of English landscape painters,—Turner. A prize will be given for a production in which the problem shall be solved of adapting a design to a given and definite space for the decoration of a portion of a public building, and so enable the student to acquaint himself practically with a form of art in which many of the greatest artists of past days have reached their highest flights and built up their most lasting fame.

Is it too much to hope that the increased means of culture, above alluded to, not forgetting the admirable lectures of Mr. Newton on the British Museum sculpture, will speedily bear fruit, and that, as in the case of the universally admitted improvement in the quality of applied art as shown in English manufactures, brought about by the agency of the schools of art established in all parts of the country, so in pure art we may look for an improvement in draughtsmanship, in mastery of colouring, and the technique of the painter's craft?—in which it is often said, as a general rule, we are not quite on a par with Continental painters. If this be so, it is of no avail to ignore the fact, but rather let bear in mind that the confession of a deficiency is the first step towards its correction.

The Chairman said: My duty, ladies and gentlemen, is to move the adoption of the report, but I would first of all say that I occupy this position greatly against my will to-day. I am exceedingly unwell, and, moreover, I have so often taken this position in former years; but, on the receipt of Lord Houghton's letter, my

esteemed colleagues, fancying that I knew as much about the Art-Union as most of them, insisted upon my being here. The past year has been a special one with the Art-Union of London, and must always be so considered, for otherwise there might be some observation made as to the comparative smallness of the amount devoted to the purchase of pictures. If you recollect that every subscriber of a guinea has received five large engravings of Mr. Frith's pictures of "The Road to Ruin,"—engravings which could not have been furnished, as a matter of commerce, for less than from two to three guineas at the very least,—and that, in addition, a part of every guinea subscribed goes to the payment of the working expenses of the establishment, and to the printing of the report, almanac, and so forth; and yet that every subscriber of a guinea has, in addition, a chance of obtaining some portion of the sum of 3,228*l.* which is to be distributed in the shape of prizes, you will see what a wonderful instance this is of the result of co-operation. The list of deaths which the report records is a very sad one. Most of the gentlemen named were known to us, and many of them were connected with this association. I should like to say one word in memory of Sir Henry Cole, not that it is necessary to add anything to what has been so well said of him in the report, but it would be contrary to my own strong personal feelings were I to omit to express the affection I have always entertained for him. Having worked with him for a long number of years,—since the Exhibition of 1851 up to two days before he died, when he was seeking my aid to a project of his for establishing a sanitary guild in every parish (an excellent idea),—I cannot refrain from uttering my expression of affection for him, nor from saying how deeply this country is indebted to him for his remarkable perseverance and his dogged determination to carry out that which he believed to be good, and which, nine times out of ten, was good. He has left his mark, in the shape of most important results, upon the country. Reverting to another subject, I meant to have said, when speaking of the print, that, lectured, that the Art-Union of London has sent the works of the best men in the Academy all over the civilised world, not in thousands, but in hundreds of thousands? Wherever there are English-speaking people, there are to be found, thanks to the agency of the Art-Union, the landscapes of Callcott, Edwin Landseer, and Turner, the domestic pieces of Webster, Frith's "Merry Making in the Olden Time," Macclise's powerful rendering of the "play" scene in "Hamlet," and those two splendid engravings (the best produced in modern times) from the pictures by the same artist of the "Death of Nelson" and the "Meeting of Wellington and Blücher." All these are the works of Royal Academicians, and have given delight wherever they have penetrated, besides spreading the fame and reputation of the Royal Academy. I once mentioned publicly, as an evidence of the Royal Academy's want of appreciation of the work of the Art-Union of London, the circumstance which I have now referred to. Sir Charles Eastlake, then the President of the Royal Academy, was present, and he said, equally publicly, "I am perfectly ashamed of myself, and hope that the matter will soon be rectified." But it never was rectified. While duly appreciating the work done by the Royal Academy, I have felt myself bound to refer to the strange manner in which it has seen fit to ignore altogether the good work of the Art-Union of London. I have much pleasure in moving the adoption of the report.

Mr. James Hoggood, J.P., seconded the motion and the report was unanimously adopted.

Mr. Francis Bannock, F.S.A., moved a vote of thanks to the honorary secretaries, Messrs. Lewis Pocock and Edmund E. Antrobus, "for their unceasing endeavours to advance in every way the interests of the society." Mr. Pocock had been for forty-five years connected with the Art-Union as one of its honorary secretaries, and was still giving good and faithful service. The Art-Union had kept alive the fine art of line-engraving, which would otherwise have become almost extinct. It had also encouraged modelling in Faience, originated by "Felix Sumnerly" (Sir Henry Cole). It had also kept alive and worthily sustained the art of medal design, the series of medals produced under its auspices being unrivalled by modern work of the kind. Wood-engraving had also received its due meed of encouragement at the hands of the Art-

means which are being taken with regard to the promotion of mural painting will be persevered in, for I believe the practice of mural painting to be one of the best possible schools of art. By giving opportunities to young men to decorate the walls of our town-halls and vestry-halls we shall be doing more to create a school of painters than can possibly be done by any ordinary school of art. While referring to the Royal Academy, I cannot avoid saying that it has always pained me to feel that that body has never properly recognised the importance of the Art-Union of London. It is a simple and a silly thing, perhaps, to say, but when I tell you that during the whole of the period that the Art-Union has been established, neither of the honorary secretaries has ever been invited to the dinner of the Royal Academy, you will see, I think, marked evidence of a want of proper appreciation by the Academy of an institution to which it and the country at large,—I assert it and reassert it,—are much indebted. An amiable member of the Royal Academy, and a personal friend of mine, once said to me, when we were speaking of this subject,—"Yes, you have spent a great deal of money upon young artists, but you don't spend any upon us!" Nothing could be more incorrect than that. Some of us have taken the trouble to look up a few figures, and we find that, in 1843, the Art-Union of London paid 2,055*l.* to members of the Royal Academy; in 1845 we paid them 2,346*l.*; in 1846, 2,000*l.*; in 1864, 3,055*l.*; in 1875, 3,350*l.*; in 1876, 2,500*l.*; and in 1880, 3,890*l.*; making a total, with the sums paid in other years which I have not mentioned, of 33,197*l.* Now, surely, on the most material and trumpery ground on which it could be based, the charge that the Art-Union of London has done nothing for the members of the Royal Academy at once vanishes. To say nothing of the fact that, since its institution, the Art-Union of London has spent among artists more than half a million of money,—an expenditure upon art which cannot but have had some beneficial effect, if only indirectly, upon members of the Academy,—what is to be said when it is recollected that the Art-Union of London has sent the works of the best men in the Academy all over the civilised world, not in thousands, but in hundreds of thousands? Wherever there are English-speaking people, there are to be found, thanks to the agency of the Art-Union, the landscapes of Callcott, Edwin Landseer, and Turner, the domestic pieces of Webster, Frith's "Merry Making in the Olden Time," Macclise's powerful rendering of the "play" scene in "Hamlet," and those two splendid engravings (the best produced in modern times) from the pictures by the same artist of the "Death of Nelson" and the "Meeting of Wellington and Blücher." All these are the works of Royal Academicians, and have given delight wherever they have penetrated, besides spreading the fame and reputation of the Royal Academy. I once mentioned publicly, as an evidence of the Royal Academy's want of appreciation of the work of the Art-Union of London, the circumstance which I have now referred to. Sir Charles Eastlake, then the President of the Royal Academy, was present, and he said, equally publicly, "I am perfectly ashamed of myself, and hope that the matter will soon be rectified." But it never was rectified. While duly appreciating the work done by the Royal Academy, I have felt myself bound to refer to the strange manner in which it has seen fit to ignore altogether the good work of the Art-Union of London. I have much pleasure in moving the adoption of the report.

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The concluding words of the indictment are as follows:—"Except the few fortunate persons who succeeded in saving themselves or their relatives no one was saved, either by the police or by the fire brigade."



## THE LATE MR. GEORGE JENNINGS.

GEORGE JENNINGS was born on the 10th of November, 1810, in a Hampshire village on the borders of the New Forest, his earliest associations contributing to a knowledge of and aliking for a country life, which, although undeveloped, was a strong feature in his character throughout his career. He was the eldest son of Joseph Jennings, who was at one time one of the leading foremen at Mr. Launcelet Burton's Works in London; and who died in 1824, George (then fourteen years old) being the eldest of six children. He had received a fair education from his uncle, a Mr. Withers, and shortly after his father's death he was taken into the business of his grandfather (a lead and glass merchant), remaining there about three years, when he left and served his uncle, John Jennings, who carried on a large business as a plumber at Southwick, near Southampton. There he continued until the summer of 1831, gaining a very general experience in his trade, for his activity and aptitude as a youth for acquiring practical knowledge was very great. Then, thinking nothing more could be learnt in a country business, he decided to make his way to London. A short time later saw him making his first start in life, with a brave heart, but with only a few shillings in his pocket. He was often wont to dwell on this period of his life, and was fond of narrating to friends the story of his progress from his native village, through Southampton, the Isle of Wight, Portsmouth, Brighton, and other towns (in many of which he obtained work) towards London, where he was set down by the coach in Holborn in the winter of the same year. This winter was memorable for its severity; the Thames was nearly frozen over, snow lay deep upon the ground, thousands were out of work, and for some time he found it difficult to obtain a livelihood. Ultimately he obtained employment with Messrs. Burton, of Newcastle-street. Whilst there, he soon acquired great skill as a plumber, and he was thus engaged upon many of the most important works in those days, when no task was too difficult for him and no day too long, his personal activity and strength being remarkable at that time. In 1834 his grandmother, who had succeeded to her husband's business, died, and on the division of her property amongst the family, he inherited a small patrimony, which enabled him to commence business for himself, first in Paris-street, Lambeth, and subsequently, in 1838, in Charlotte-street, Blackfriars-road. It was here that his self-reliance, perseverance, and indomitable industry laid the foundations of his future success. It was at this time, also, that was fostered in him that originality of conception which resulted in so many inventions, in the development of which his thorough practical knowledge so greatly assisted him.

In 1847 he produced his "indiarubber tube tape," which were widely used, and for which he gained his first public award, the Medal of the Society of Arts. This was personally presented by the late Prince Consort, whose encouraging remarks on that occasion he has often said greatly stimulated him to increased exertions. He was consulted as to the arrangement of the sanitary works in connexion with the Great Exhibition of 1851, and their execution was entrusted to his care. At the close of the Exhibition he was awarded a medal, and he afterwards carried out similar works on the removal of the building and its re-erection as the Crystal Palace at Sydenham, having to work day and night for their completion.

The first invention which brought him prominently into notice was his Improved Shutter Fastener, the excellence of which led us to give him strong commendation.\*

Soon after the outbreak of the Russian War, and under the direction of Mr. Brunel and Mr. Sydney Herbert, he constructed the sanitary fittings for the British hospitals at Varna and Scutari, in the Crimea, where they were fixed by a staff of his own workmen.

Later, having conceived and patented an improvement in the construction of stoneware drain-pipes, and experiencing some difficulty in securing its introduction by London potters to whom it was shown, his attention was first directed to the extensive clay-beds at Parkstone, in Dorsetshire, and the idea of utilising the

same suggested itself. He at once secured the lease of these beds, and erected kilns and pottery works, assisted by the experience and supervision of Mr. J. S. Hudson (the present manager), thus originating the extensive manufacturing of stoneware and terra-cotta goods which have since so greatly developed, and now cover many acres. His ideas being thus directed into a new channel, he produced many novelties and improvements, amongst which may be mentioned his patent bonding bricks, and ornamental and structural terra-cotta and facing blocks, the latter being successfully used by him in the construction of some experimental huts at Honslow Barracks, this being probably the first instance of the use of stoneware facings in connexion with concrete structures. On his works he gave employment to a large number of men, and ships were purchased for the conveyance of manufactures, and to bring coals and necessary material. Amongst other local improvements was the construction of a pier and tramway nearly half a mile in length across the mud-banks of Poole Harbour to facilitate loading vessels in deep water. During the progress of these works he formed a strong attachment for the neighbourhood, and in later years occupied a farm of considerable acreage, which he greatly improved by drainage and the reclamation of waste lands; he erected cottages, model farm buildings, and a village school, in the arrangement and construction of all of which he took the greatest interest. He also purchased a small freehold estate in the locality, and, although this was occupied by him for some years as an occasional summer residence, it was his chief pleasure to look forward to the time when he could retire from business and pass there the autumn of his life in country pursuits. This wish was never realised, for his active mind and untiring energy kept him fully occupied to the last.

About 1857 the development of his London business demanded further space, and he removed to Holland-street, Blackfriars; here he gave attention more particularly to hydraulic fittings, and amongst other large operations, successfully constructed the entire works in connexion with the water supply to the town of Wilton, as well as the supply of the necessary fittings for similar works for Grantham and other towns.

The site of the premises in Holland-street being needed for the extension of the London, Chatham, and Dover Railway, he removed to Palace Wharf, Stangate. It was at this time that the utilisation of indiarubber for mechanical and other purposes was receiving much consideration, and, having been induced to direct his attention to the subject, he erected improved machinery for its manufacture, and employed it largely in the construction of valves of all kinds. He also invented and patented an improved form of the endless elastic band now so universally used, as well as several varieties of capsules for hermetically sealing bottles, jars, and other vessels. For several years his production of rubber goods of every description was very great, both in London and at a branch manufactory established at Birmingham. Meanwhile, his business as a sanitary engineer was always increasing; the success which attended his work at the Exhibition of 1851 led to the sanitary arrangements at those of London, 1862, and Dublin, 1865, being entrusted to his care. At both of these exhibitions he gained further distinction and awards. It was on his return from the latter city that, arriving in London on the morning of the 23rd of March, 1865, and directing the cabman to drive to Lambeth, he was told there had been a great fire there the previous night. A presentiment of evil induced him to buy a morning paper, and from this it was he first learned of the total destruction and loss of his works, plant, and stock-in-trade,—the policy of insurance (owing to the anticipated occupation of the ground by the present St. Thomas's Hospital) having been allowed to lapse a few days before. Undaunted by the disaster,—for obstacles seemed but to give him fresh impetus,—he set to work with renewed energy, taking larger premises nearly opposite those destroyed, and where his business is at present being successfully continued.

In 1867 he carried out the sanitary work for the Paris Exhibition, where he was again awarded a silver medal. In 1872 he had the arrangement of rooms at St. Paul's Cathedral on the occasion of the thanksgiving service for the recovery of H.R.H. the Prince of Wales, and in the autumn of the same year he com-

menced the drainage and other works for the Exhibition of 1873 in Vienna, which were placed in his hands by Baron Schwartzsenborn. This was a work of considerable magnitude, with many difficulties to contend against, nearly five miles of stoneware pipes of various sizes, and 650 appliances, having to be sent from England, and the drains laid in most difficult ground. It was, however, successfully completed, and the Medal of "Progress" was awarded to him at the close of the exhibition.

In later years he executed similar works at the Centennial Exhibition in Philadelphia in 1876, and besides being an exhibitor at many other smaller exhibitions he exhibited largely at Paris, 1878; Sydney, 1879; Melbourne, 1880; and Adelaide, 1881; at all of which he was successful in obtaining highest awards. It would be almost impossible to recall the many public and private works with which he was connected, but he often said with pride that from "Mr. Hope's house in Piccadilly, to the City Carlton and Liberal Clubs, there was hardly one in London" which he had not fitted or in which his appliances were not used.

His contracts with the Royal Engineer and War Departments and the Admiralty extended over many years, and his works will be found in Government buildings in every portion of the British Empire.

His latest inventions referred to the heating and ventilation of buildings on a novel principle, and quite recently he applied the system successfully to the Police Orphanage at Twickenham, the new Brighton Hospital, and other buildings.

Besides works appertaining to his business, he gave much attention to private enterprise; his own residence in Nightingale-lane, the material for which was prepared at his Parkstone Works, was built under his immediate supervision. He also developed and laid out the Fernside-road Estate at Clapham, and built nearly all the houses on this property, and more recently, in Nightingale-lane, he erected six houses, in which he took especial pride.

Up to the moment of the accident which terminated so active a career, he was engaged in schemes of further usefulness. On Thursday, the 13th inst., after the duties of the day had been performed, he was driving home in a gig with his eldest son, when the horse shied and brought the vehicle into collision with a heavy van; both occupants were thrown to the ground, Mr. Jennings, sen., sustaining injuries from which he gradually sank. He died on Monday afternoon, April 17th, 1882, in his seventy-second year, leaving a widow and large family to mourn his loss. He was interred at Norwood Cemetery on Saturday, the 22nd inst., the funeral, although a private one, being attended by a large number of personal friends and of his London employes.

Mr. Jennings was a very old member of the Society of Arts, and formerly took an active part in their discussions; he also belonged to the "Royal Naval" Lodge of Freemasons and the Glass-Sellers' Company.

In this brief sketch very little reference has been made to the many improvements effected by Mr. Jennings in sanitary arrangements and appliances, which have been from time to time referred to in the pages of the *Builder*; it is sufficient to say nearly all have been received with much favour by the public, not only in England, but in every corner of the civilised world, where his works will long stand as a record of his indefatigable industry, and as a lasting memento of him as a pioneer of sanitary engineering.

**Auctioneers' and Surveyors' Clerks' Provident Association.**—On Saturday, in the absence of the Lord Mayor, Mr. D. Watney presided at a large meeting of auctioneers, surveyors, and clerks at the Auction Mart, Tokenhouse-yard, to consider a scheme for the establishment of a Provident Association of Clerks. The chairman stated that a preliminary committee had, after great labour, propounded a scheme, which they submitted as a report, according to which the association would come under the Friendly Societies Act, and therefore under Government supervision. The great points for consideration were the ages at which clerks should be eligible for membership, and at what age the benefits should cease. The figures of the committee were based strictly upon actuarial estimates. The society would, he believed, start upon a sound basis.

\* We have before us a letter from him, received not long after this, to the following effect:—"Your notice of my inventions has built me a shop, filled it with men, and made my fortune. What can I do for you in return?"



## ANCIENT BRIDGE CHAPELS.

ST. PAUL'S ECCELESIOLOGICAL SOCIETY.

MR. S. WAYLAND KERSHAW, F.S.A., of Lambeth Palace Library, read an interesting paper "On the Chapel of All Souls, Rochester Bridge, with notes on other Bridge Chapels," before the St. Paul's Ecclesiological Society on the 20th inst. Minor Canon Shuttleworth in the chair. Mr. Kershaw observed that the subject of bridge and wayside chapels opened up a large and varied field of inquiry. As so few existing examples of bridge chapels were left in England, we had to recur to rare prints and illuminated books for some idea of their structure and importance. The representations, however, of any architectural work in MSS. must be taken with reserve, as the models for such were often taken from the buildings nearest at hand. We accordingly found churches and the like edifices generally represented of the style in vogue at the time of the production of the MSS., and not of the actual date of the buildings themselves.

The religious use of both wayside and bridge chapels was similar in many respects, and their connexion with or dependence on the great monastic houses or private lands was somewhat alike. Their present condition was much more ruinous in England than abroad, where they had long been preserved (some of them had been rebuilt), and were still employed for service. In Germany and Italy they were to be met with, unfolding their story of religion and art. In some, were painted frescoes, while several recorded circumstances of historical or local interest. The turret or spire of many a roadside chapel or votive shrine greeted the traveller over the sunny slopes of France, or added a peculiar fascination to the picturesque valleys and snow-crowned heights of the Alps. The most remarkable bridge chapel abroad is the one dedicated to Santa Maria del' Epina on the side of the bridge over the Arno at Pisa, erected about 1230. Built of the rich stone and marble of the district, it is ornamented with niches and figures, and, though renovated and repaired, still presents a graceful appearance. Chapels attached to the Guilds or religious houses were sometimes situated on the bridge pathway, and occasionally, the apartments over bars or gates at the entrances of a town were set apart for devotional use or for the lodgings of a priest. Gosling, in his "Walks in Canterbury," says,—"In the time of King Richard II., Holy Cross Church was over the gate, which, when Archbishop Sudbury took down and rebuilt, he erected the present church."

Bridge chapels existed in various parts of England, the most famous, architecturally, being those of St. Anne on Wakefield Bridge and St. William on the Ouse Bridge at York. In London there were examples, especially on Old London Bridge, where, according to Howell's "Londinopolis" (edition of 1657), "in King John's time a mayor, being master workman of the bridge, builded from the foundation the large chapel on the bridge upon his own charges, which chapel was then endowed with two priests and four clerks, beside chantries." This chapel, dedicated to St. Thomas, stood on the east side of the bridge, having an entrance from the river as well as from the roadway, the lower chapel being paved with black and white marble. The upper chapel was lighted by eight windows. The building remained nearly in its original state till the removal of the houses on the bridge, when it was converted into a warehouse, and a wooden ceiling of strong beams crossing each other, was erected. The chapel lasted in this ruined condition till about the middle of last century, when it was destroyed. In the Craze collection of prints, in the British Museum, there are some quaint and interesting views of this edifice.

The architecture of some of these bridge chapels was singularly exquisite; that at Wakefield, dedicated to St. Anne, was of the fourteenth century. The chantry was endowed after the famous battle fought near that place in 1460 between the forces of the "rival Roses." The chapel was remarkable as a fine example of the Late Decorated period, and, though early in the present century it was in a sad state of ruin, was restored by the late Sir Gilbert Scott, R.A., about forty years ago, and was now used for service. The whole building was most elaborate and ornamental in details, the divisions of the parapet (west front) being filled with sculptured figures, the general effect being exceedingly rich. The

similarity of these carvings to those in New College Chapel, Oxford, had been fully described by Messrs. Buckler in a learned pamphlet. The ancient parts of the chapel were now few, but it would seem that the architecture of the original structure was alike in character to parts of York or Beverley Minster. Whatever might have been the beauties of the earlier work, we could not but be grateful for the spirit which rescued this, one of the most noted of bridge chapels, from the ruin and decay which had overtaken similar examples. There were stair turrets at the eastern angle, and these probably led to rooms, the residence of the chantry priest. The origin of the chapel was attributed by some to Edward IV., but that statement probably arose from his having founded the chantry, as before stated, the real date of the chapel being earlier,—somewhere about 1337.

For facts as to the other and noted chapel on the Ouse Bridge at York, we had to unravel the tangled threads of history and legend. On the one hand, its existence was attributed to the prayers of St. William, who, on returning to York from Rome, was met by so great a crowd that the wooden bridge gave way, and all would have been drowned, but on his entreaties no one perished, and as a memorial for their preservation, the chapel was erected on the scene of the accident. Another writer traced its existence to a fray which took place on the bridge between the citizens and a Scotch nobleman, about 1268. The servants of the Scotsman having been slain, the citizens of York had to pay a large sum for the erection of a chapel on the spot, and to find priests to celebrate mass for the souls of the slain. On the rebuilding of the Ouse Bridge, under Archbishop Walter de Grey (1215-1256), several portions of the old Norman work of the chapel were fortunately preserved.

The work of Archbishop Walter de Grey at York recalled the similar efforts of a southern bishop,—Gundulph,—who very much contributed towards the construction of Rochester Cathedral and Bridge, thus showing how, in early ages, the erection and care of great works were confided to Prelate-architects. At the Reformation the chapel on the Ouse Bridge had several chantries, the original grants to which are among the city records. After that period it was converted into an exchange, where the Society of Hamburg Merchants used to assemble. In 1810 it was removed. The chapel was an extremely interesting example of the Early English period; the porch was of an earlier date, as was also the stone screen; both these portions had richly-ornamented arches and mouldings, with the cable and chevron pattern, so significant of Norman work. Some etchings of these beautiful details were to be found in Cave's "Antiquities of York" (1813).

The bridge chapel over the river Don at Rotherham was too nearly allied to its neighbour at Wakefield, in beauty and typical significance, to allow it to be passed unnoticed. According to Buckler, the chapel nearly approached that of Wakefield in dimensions. The earliest known notice of it was in the will of one John Bokyns, in 1483, who left 3s. 4d. "to the fabric of the chapel to be built on Rotherham Bridge." Leland, in his "Itinerary," records, in 1550,—"I entered into Rotherham by a fair stone bridge of iiii arches, and on it a chapel of stone, well wrought." In 1681 the chapel was converted from its sacred use to that of an almshouse, and in 1778 was degraded by being made to serve as a prison.

Some curious structural particulars connected with bridge and wayside chapels have been brought to light. A remarkable instance is that of the way-side chapel at Droitwich, where the high road passed through the building, and divided the congregation from the reading-desk and pulpit!

Smaller bridge chapels of interest, now destroyed or dilapidated, were those at Bradford-on-Avon (Wilts), Bridgenorth (Shropshire), St. Ives (Hants), Wallingford (Berks), Dorchester (Oxon), the Elvet Bridge at Durham, and those at Exeter, Newcastle, and Barnard Castle. Of way-side chapels, many were scattered on the route to the famous shrine of our Lady at Walsingham.

The situation of Rochester, on the high road to the Continent, made it of much historical importance, and the bridge across the Medway was perhaps one of the earliest in the South of England. Bridges over the great North roads were rather more common, and we read of those

at York, Doncaster, Nottingham, and other centres of travel in the Middle ages. A certain amount of veneration attached to these ancient bridges, and it was the custom in Ireland, so late as a hundred years ago, for natives, on passing over a bridge, to show some kind of respect and to pray for the soul of the builder. Rochester Bridge, beneath the shadow of that ancient cathedral whose chief architects were Bishops Ernulf and Gundulph, was naturally looked upon with consideration by those prelates, as it would safely conduct many pilgrims to their own shrine and to the far-famed Minster at Canterbury. The Crusader, on his way to the East, the stately Cardinal and foreign prince, with their attendants, the way-worn pilgrim, and the merchant-voyager, would form but a few of the passengers who, in wending their way southwards would say a passing prayer at the Bridge Chapel of All Souls'. Rochester Bridge in early and medieval times was closely linked with the history of the cathedral. The first bridge was constructed of wood, and Prior Ernulf's testimony was that it existed before 1216. In the "Archæologia" of the Society of Antiquaries (vol. vii.) was a description and plan of this ancient timber bridge. It was worthy of being borne in mind that this and London Bridge (also of wood) were built about the same time. Kilburne, in his "Survey of Kent," states that in 1281 the remains of the old bridge were borne down with the breaking of the frost, and carried away with the stream. This bridge had many peculiarities. A tower of timber, with strong gates, was built at the east end, and used as a defence for the passage across it. The second bridge was the "fair bridge of stone" built by Sir R. Knolles and Sir John Cobham in 1387, and to the repair and maintenance of which Archbishops Morton and Warham contributed. (It should be remembered that both the old bridges were in a different position to the present structure, being placed rather higher up the Medway.) The foundation-charter of this bridge was preserved in the Bishops' Registers, and a transcript of it is contained in Thorpe's "Customale Roffensis." The common seal of the bridge wardens had a view of this bridge. By the preservation of such archives as the famous "Textus Roffensis" in the Chapter Library of Rochester, and of other documents in the sister cathedral of Canterbury, we were enabled to trace many particulars relating to this bridge; and last, though not least, the Archiepiscopal registers of Morton & Warham at Lambeth Palace supply much information as to the architectural works of those primates, whose names were inseparably connected with the history of the bridge.

The Chapel of All Souls, as founded by Sir John Cobham, was intended chiefly for the use of travellers, and three chaplains were appointed to officiate in it, and paid out of the income of the bridge estates. Kilburne, in his "Survey of Kent" (1659), speaks of it as the "Trinity" Chapel,—on what authority did not appear. Phillipott, in his "Kent Surveyed" (1659), says,—"The chapel or chantry of Rochester Bridge was founded in the year 1389 by John de Cobham, and dedicated to the Holy Trinity, and called at its first institution All Souls' Chapel, because prayers and orisons were there to be offered up for the health of all Christian souls." Another chronicler (Fabyan, 1406) says,—"In this year Sir R. Knolles, kn't., made an end of his werke at Rochester Bridge and Chappell at the sayd byrdge fote, and dyed shortly after, when he had newe re-edified the body of the White Fryers Church standing in Flete-strete, and done to that house many notable benefytes." Grafton, another chronicler, writing in 1409, says,—"This year Rochester Bridge was began to be builded of stone, and the same, together with the chappell standyng at the ende of the same, was finished by Sir R. Knolles, knight." It was to be regretted that so few volumes existed that gave any detailed history of the chapel, and that particulars of it were few and far between, no treatise on its structure, similar to that on the chapels of Wakefield and Rotherham, having yet appeared. Statements concerning the chapel were to be sought for in isolated papers and far-off references. In vol. x. of the "Archæologia Cantiana" was an inventory of the possessions of the chapel in the year 1549. It was interesting to note that another small chapel was built on the stone quay at the Strood end of the bridge, in which passengers crossing the bridge might previously kneel in devotion or offer thanks. This chapel was erected by Gilbert de Glanville, Bishop of Rochester (1185-1215). We learn



that Queen Isabella, when she came to Strood in 1357, entered the chapel of "St. Mary," and offered an oblation of 6s. 8d. in honour of the eleven thousand virgins. The bridge chapel seemed to have ceased to be a place of worship, rather by disuse than by legal dissolution, about the time of Elizabeth, for in the nineteenth year of her reign Thorpe's "Castnalle Roffensis" has the following:—

"The Queen's Attorney-General sued the wardens of the bridge for 513*l.*, being the amount of 18*l.* per annum for twenty-eight years and a half, the last part, which sum was at that time presumed to be forfeited and due to the Queen by virtue of the Act 1 Ed. VI. for dissolving chantries. It not appearing to the jury that any service had been performed here, nor any stipend paid to any chaplain or chantry priest for officiating here, for five years next before the passing that Act, a verdict was given for the wardens."

From its enclosed position between the newly erected Bridge Chambers on the one side and a large house on the other, it was difficult to obtain a satisfactory view of the chapel. Its length might be approximately given as 40 ft., with a breadth of 15 ft. The outer walls (i.e., the east and south) were more clearly visible from the adjoining Castle grounds, as also was the general view of the chapel. It was now roofless. The interior indicated, at the east end, the position of an altar, and the north and south walls were pierced by windows, two of which had been filled up by brickwork or masonry. There were traces of a piscina and other remains in the south wall, and in the Bridge Chambers adjoining were interesting fragments of corbel heads and ornamental details preserved on the removal of the upper buildings over the chapel. In conclusion, Mr. Kershaw said he could not omit to mention the careful way in which the authorities of the Bridge Chambers had lately had this ancient and interesting chapel railed in and preserved from danger, thus preserving to the architect and antiquary an example of these rare structures, once the most frequented of the wayside shrines of England.

#### Rood Screen at St. Firmin's Church, North Crawley, Bucks.

At a meeting of the St. Paul's Ecclesiological Society, on the 20th inst., Mr. V. W. Maughan read the following paper:—

The Church of St. Firmin, North Crawley, situated about three miles and a half west of Newport-Pagnell, consists of chancel, nave with clerestory, aisles and porch, and west tower, and is of the Decorated and Perpendicular styles of architecture. The most attractive feature in the church is the fine rood-loft screen, which remains in a very perfect state. It is a rich Perpendicular specimen of open screen-work, divided into sixteen compartments. In the panels at the base are painted sixteen figures, which figures I am going to attempt to describe. Beginning at the Gospel, or north corner of the screen, the first figure is that of Jeremy, in a cloak which somewhat resembles a cope; beneath this is a girded garment reaching to the ankles. He bears a scroll, on which is written "Me dixit Dñs Patrem vocabis." After him comes David in a red robe with a leathern girdle, and a coat trimmed with fur at the sleeves and hem. On his scroll is written, "Filius es Tu, ego hodie genni Te." The third figure is Isalah, in a cloak with an ermine tippet, and on the scroll are the words, "Ecce virgo concipiet et pariet Filium." Next we have Daniel in a short vestment, with the following inscription,—"Post obdormadus septuaginta dominus occidet." After him is a figure clad in the same way as Daniel, and whom I take to be Hosea; but this has been very much injured. Among the last figure on this portion of the screen, is immediately behind the reading pew. I will leave the doors to the last, as they have figures of saints on them. On the eleventh panel from the north end (including the panels on the doors) is a figure of Malachi in a red fur-trimmed robe, beneath which is a long red-girded garment; a fur tippet is over his shoulders. The scroll bears the following,—"Ad vos . . . judicio et ero testis velox." The next figure is very much defaced, but I am inclined to think it is Zechariah. After this is Micah, in a sage-green robe, with very pointed sleeves; the inscription I was unable to decipher. The three next figures are very indistinct, being behind the pulpit, and also very much scratched. I think the last but one is Daniel. On the north door are Saints Blaise and

Martin. St. Blaise is vested in Eucharistic vestments, cassock, appressed albe, dalmatic, chasuble, mitre, and pastoral staff. In one hand he holds a wool-comb, the instrument of his martyrdom. St. Martin is vested in Eucharistic vestments as St. Blaise, but has in addition the glove and the ring. On the south door are Saints Edward, King, and Edmund the King. St. Edward is robed in a large cloak trimmed with ermine, and has a tippet of ermine; beneath the cloak is a fur-lined garment. In one hand is the seal, in the other the sceptre. St. Edmund, the usual pendant of St. Edward, is robed in the same way as St. Edward, but has no seal or sceptre, but an arrow in his hand. Both wear crowns.

#### THE GREEK TRIGLYPH.

As in my last letter I invited criticism on my proposals, it may seem uncourteous if, when a person in the position of Professor Roger Smith comes forward, in his own name, to express an opinion on the subject, and in such temperate language, I do not at least state why I cannot admit his conclusions. I cannot but wish, however, he had taken a little more pains to understand what I proposed, and what really was the problem I attempted to solve. He does not, for instance, once allude to my theory of the invention of the Greek triglyph, to explain which was practically the only motive I had for addressing you on the present occasion.

In the present state of our knowledge of Greek architecture, looking at the forms of the pediments, the known mode of roofing with tiles, and the indications of wooden forms in the entablature, it appears to me quite certain that Greek temples were, in all ages, roofed with a triangular combination of timbers in outline very nearly what I have represented. If this is not granted, *adit questio*, I have no more to say on the subject; but, if it is, all remarks regarding flat Assyrian roofs, or tall Gothic ones, are wholly irrelevant, and have no bearing on the subject. The problem we have got to solve is simply to design a form of wooden truss which will most nearly reproduce the indication on stone, which we afterwards find in the perfected architecture of the Greeks. How far I have succeeded in this, others must judge; but at present I am not aware of any suggestion that seems to me to come so near a solution of the difficulty.

Professor Smith objects to the use of planks by the Greeks. I don't know why. The Egyptians used saws, as we know from the paintings, long before the time we are speaking of, and the Greeks ascribed their invention to Dædalus, which merely means time out of mind, in other words, that they really did not know who invented them, or when.

But the real answer is, that all the forms of the finished Greek architecture,—say of the Parthenon,—show most distinct indication of planks being used for the most essential part of that wooden framing which we afterwards find them copying in stone.

If Professor Smith objects to my diagram, the proper and legitimate mode of criticism is not merely to find fault and suggest difficulties,—that any one can do,—but to show how it could be amended. If he or any one else will design a roofing frame which is more simple and so easily put together, and which answers better the purposes it was used for,—therefore so Greek,—he will confer a benefit on the science of carpentry, and if he will propose one which will reproduce in a more exact manner all the indications found in the finished masonry in stone he will confer as great a benefit on Greek archaeology. Whenever this is accomplished, I shall be only too glad to withdraw my diagram, and confess that I was mistaken, but till it is done I must be excused if I consider my theory of the Greek triglyph,—as used anterior to the introduction of peristyles,—as the one most in accordance with the known indications that have yet been proposed.

JAS. FERGUSON.

**The Eton Officers' Memorial.**—The memorial to the Eton officers who fell in the Afghan and South African campaigns, which is now in course of erection in the Eton College Chapel, is expected to be completed very shortly, and it will be formally inaugurated on the forthcoming "Speech-day," which will this year take place on the 5th of June. The memorial is, as was stated some time ago, a stone screen, the cost of which will be about 2,500*l.* It is from a design by the late Mr. G. E. Street, R.A.

#### LIGHT CASE.

JORDAN V. MAXWELL.

THE plaintiff in this case (Chancery Division, before Mr. Justice Kay), was a law stationer in Chancery-lane, and the action was brought for an injunction to restrain the defendants, Messrs. Maxwell & Son, from erecting on the site of certain old buildings in Crown-court, Chancery-lane, any new buildings which should have the effect of obstructing or darkening the lights or windows of the plaintiff, as enjoyed by him prior to the removal, by the defendants of the said old buildings; and, further, that the damages sustained by the plaintiff might be assessed by the Court and paid by the defendants to the plaintiff. It appeared that the plaintiff's back window on the ground-floor looked into Crown-court, facing west, and the defendants' new buildings were at the end of the court, which was 55 ft. 6 in. long and 20 ft. wide. The defendants' building was originally 38 ft. high, with a stack of chimneys occupying about a third of the width and of the height of 11 ft. The new buildings were erected to the height of 54 ft., and it was alleged by the plaintiff that the effect of this extra height was to darken the plaintiff's window, and cause the room to be less convenient and comfortable for business purposes.

Mr. Justice Kay reviewed the evidence of the witnesses at some length, and said it was quite evident that the increased height of the defendants' building must necessarily detract from the direct light from the sun. It had been said that there was as much reflected light now as before the new building was erected, and the chief evidence, he had come to the conclusion that there was an appreciable diminution of the light enjoyed by the plaintiff, and that he was obliged to light the gas somewhere about an hour earlier in dull weather, and that there was such an interference both of the direct and reflected light as to entitle the plaintiff to damages. These damages he would himself assess at the sum of 50*l.*, and the defendants must pay the costs of the action.

#### ARCHITECTS' QUANTITIES.

SIR,—Your correspondent, "J. P.," by his letter published in your issue of the 22nd inst., propounds a question which it is most right should be discussed if it be true, as stated by him, that an injustice is done to a builder by calling upon him to pay the surveyor's charges for bills of quantities before he receives a certificate for work executed; and, inasmuch as he has done us the honour to open the discussion by reference to the works about to be carried out under our superintendence at the Hendon Union Workhouse, we ask the favour of your permitting us to say that, in our practice, it has more than once occurred that, when we have included the surveyor's charges in the first certificate, the builder has neglected to pay the amount; in one case it was not paid until the fourth certificate was due, and then only on our refusal to give this certificate until we had proof that the debt was discharged. The question naturally occurred to us, What would be the position of our clients if the builder became bankrupt and the balance in the hands of the Guardians was found insufficient to pay the surveyor's fees? We had no doubt that our clients would be the losers by our carelessness; but even if this were not so, there is undoubtedly an implied obligation on the part of an architect that he shall protect the quantity surveyor from loss; and how is this to be done if he be left to the mercy of a dishonest builder? Upon this reasoning we have, on all occasions, inserted the clause complained of by your correspondent.

We are quite aware that, in ordinary practice, builders who tender for works are nominated by the architect, who selects only those in whom he is aware he can have confidence, and the necessity for such a clause is therefore not so apparent; but, in the case of workhouse buildings, the Poor Law Act of 1867 makes it obligatory upon Guardians to publicly advertise for tenders, and the lowest price is almost invariably accepted, with but slight care as to the status of the builder undertaking the work, and hence the necessity in these cases that more than ordinary care should be exercised by the architect as to the matter in question.

We should be sorry to imply by this letter that in the case of the work referred to (the Hendon Union contract) we have any doubt as to the character of the builder whose tender has been accepted. We know nothing whatever



about him, and have certainly no reason to doubt either his ability or his intention to act fairly.

The clause for payment of the quantities before the receipt of the first certificate does not institute a "new mode of payment," it is one that has appeared in all bills of quantities for many years past of works executed under us; it has never before been objected to, and in the interest of our clients we shall not alter our custom unless we have good reasons shown us for doing so.

Surely your correspondent intended a vein of humour to underlie his assertion that when the quantities are paid for before, instead of after, the receipt of the first instalment, the architect is induced to give the builder a larger certificate than he would under other circumstances? He cannot seriously mean to impute that an architect of any standing would allow himself to be guided by such motives? Nevertheless, as some of your readers may mistake his meaning, let me point out that, supposing it is possible for an architect to be influenced by such considerations, he would undoubtedly, when writing his first certificate, make the amount payable to the builder as small as possible, in order that, if the quantity surveyor was not paid and the builder became bankrupt, there would be a larger balance to fall back upon. It would be interesting to learn how, if "J. P." were the architect in question, he would argue otherwise.

H. SAXON SNELL & SONS.

#### A VIENNA MONUMENT.

The year 1683 is a momentous one in the history of Vienna. The Austrian capital in that year underwent a terrible siege by the Turks, whom, however, the Emperor Leopold, with the aid of his allies, the Polish King John Sobieski, Prince Carl of Lorraine, and the Princes of Saxony and Bavaria, finally succeeded in defeating and compelling to retire. Next year, 1683, the second centenary of the successful defence of Vienna against the Ottomans is to be celebrated by popular *fetes*, and, amongst other things, by the commencement of a monument, for which the Austrian Ministry has just invited designs. It is intended that the monument should be erected under the lofty spire of St. Stephen's Cathedral. It is to be constructed of a fine kind of limestone, and the Government have decided to expend the sum of 50,000 florins (5,000 £) upon the work. The sums of 2,000 florins, 1,500 florins, and 1,000 florins, have been set aside as prizes for the first, second, and third best designs respectively. The general form of the monument is to resemble that of the Doges at Venice. It is also to be ornamented with statues of the chief personages who were engaged in defence of the city, including, in addition to the sovereigns and princes above mentioned, the following persons:—Rodiger von Starhemberg, Burgomaster Liebenberg, the leader of the University Students' Corps, Paul Borbait, and Bishop Leopold Kollonitz. The drawings and models are to be one-tenth of the natural size, and are to be sent in by April 15, 1883. It has given some dissatisfaction that the Government has acted in this matter without consulting the civic authorities. Most critics would have preferred as the site of the monument, not St. Stephen's Cathedral, but some spot on the grand open boulevard, the Ring-strasse, which runs upon the site of those very walls which witnessed the valiant deeds that are to be commemorated by this work.

#### STATUES.

Lord Beaconsfield.—A meeting of the General Committee of the National Memorial to the Earl of Beaconsfield was held last week, when it was stated that the statue which is being executed by Signor Raggi for erection in Parliament-square, Westminster, will be ready for casting by August next.

Mr. Gladstone.—Members of Parliament and others were invited on Tuesday, by Mr. A. Bruce Joy, the sculptor, to inspect, in a temporary building on the Victoria Embankment, a model of his colossal statue of Mr. Gladstone, which has been presented to the public by Mr. Wilberforce Bryant, and will shortly be erected in the low-road, in front of the railway station. The figure is 9 ft. in height, and it will stand on a grey granite pedestal, 12 ft. in height, on which will be the simple word "Gladstone."

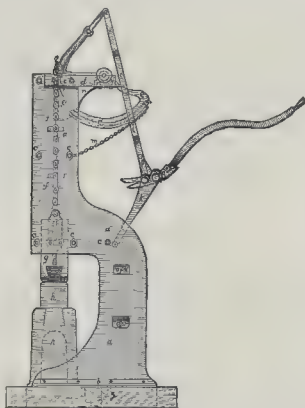
#### THE COMPOUND MANUAL LEVER-HAMMER.

THE object of this invention is to supply a more powerful hammer than the sledge-hammer, in cases where it is inconvenient to have recourse to steam-power, and it can be had at such a cost as will place it within the reach of a numerous class.

A frame, consisting of two vertical side-pieces, is suitably secured to a base-plate or dangles by bolts and nuts, and is connected together by stays at suitable intervals. These side-pieces of frame carry at their upper part a head-piece, upon which is centred an eccentric-shaped quadrant. To the upper corner of the eccentric quadrant is secured the upper end of a chain, carrying at its lower end the striking piece or hammer proper. Directly beneath the hammer, and at its base, is placed the anvil, within or near to the frame, the vertical sides of which are suitably curved for the purpose of its convenient reception. By the motion of the eccentric-shaped quadrant, which is operated by means of a V, L, or other angular-shaped lever, having a linked connexion or other suitable connecting rod at the angle, and whose fulcrum is on a rod or stay fixed to the hammer-frame, the chain and striking piece or hammer proper are raised by the deflection of the angular lever to the desired height, and the blows are given by alternately operating or releasing the lever.

The hammer is thus under perfect control, and can be easily worked by one man. A small-sized hammer on this construction will deliver a blow of from one pound to half a ton, as may be required, and twenty-five half-ton blows, or sixty of half that power, can easily be delivered per minute.

In the accompanying diagram, a side elevation, the frame is marked A; the base or foundation-plate or flange, B; the stays throughout, C;



the cross or head-piece carrying the quadrant, and on which it centres, D; the eccentric quadrant, E; the chain, F; the striking piece or hammer, G; the anvil, H; the anvil-block, H'; the angular lever operating the quadrant, I.

#### MASTERS AND MEN.

Liverpool Brickmakers.—According to the Liverpool Post, a strike, which threatens seriously to affect the Liverpool building trade, broke out on Tuesday among the "wheelers" who are employed in the making of bricks. The men demand an advance of threepence per thousand, and have for the present ceased work, thus bringing the brickmaking trade to a standstill, and throwing some 3,000 or 4,000 men out of work.

Welsh Quarrymen.—In March last the quarrymen of Festiniog formed a committee to bring about a reduction in the present working-hours. The committee made an application to the agents of the different quarries to have the hours of labour shortened, but received no reply. A second circular was issued and forwarded to the agents, and replies were in due course received. These, however, were unfavourable. In the interval the quarrymen were canvassed about the matter, and it was found that about 3,000 of

them were in favour of agitating for shortening the hours of labour, and a few hundred against it. Last Saturday a large mass meeting was held in the open air near the Assembly-rooms. About two-thirds of the quarrymen engaged at the quarries were present, and a resolution was passed to the effect that the meeting pledged itself to continue the agitation.

#### BUILDING PATENTS.\*

##### APPLICATIONS FOR LETTERS PATENT.

- 1,785. G. Rowan, London. Apparatus for ventilating. April 14, 1882.
- 1,792. A. W. L. Reddie, London. Ventilators for buildings, &c. (Com. by A. Huber, Cologne.) April 14, 1882.
- 1,827. W. P. Thompson, London. Slate, slab, or tile roofing. (Com. by H. Prodromou, Brussels.) April 17, 1882.
- 1,828. A. Smith, Huddersfield. Holding sliding window-sashes in a closed or open position. April 17, 1882.
- 1,836. W. Walker, New York, U.S.A. Manufacture of artificial stone. April 18, 1882.
- 1,857. W. Blyth, Barton-upon-Humber. Manufacture of bricks and tiles. April 18, 1882.
- 1,873. H. Fokes, Pimlico. Apparatus for sweeping chimneys, &c. April 19, 1882.

##### NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

- April 18, 1882.
- 634. T. Brindle, Southport. Appliances for veneering or facing walls or buildings. Feb. 9, 1882.
- 1,719. A. J. Boulton, London. Water meters. (Com. by E. C. Terry, Terryville, U.S.A.) April 11, 1882.
- April 21, 1882.
- 96. S. Collett, Willenhall. Lock and latch spindles, &c. Jan. 7, 1882.

##### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending April 22, 1882.

- 3,682. W. B. Healey, Westminster. Apparatus for measuring and registering the flow of liquids.

The plug of the cock has a central chamber of determined size, with two holes for the supply and discharge of the liquid therein. An air-hole is formed, passing through the shank and handle of the plug, which forms a guide to the stem of a valve, which, when the chamber is filled with liquid, rises, and closes the air-hole. The plug being then revolved, the discharge-hole allows the liquid to flow out, and air is admitted through the air-hole as the level of the liquid falls in the chamber. Gearing is attached to the stem of the plug to register the number of times it is turned. Aug. 24, 1881. Price 6d.

- 3,693. H. C. V. de Ahrebecker and H. E. J. Hamkens, Lambeth. Fluid meters, &c.

The water is led to the lower chamber of the meter, in the top cap of which are lateral curved passages, through which the water issues in oblique streams. Above the cap is mounted a wheel, on the periphery of which are oblique vanes curved in the opposite direction to the passages, on which vanes the water impinges, thereby revolving the wheel, which motion is communicated to the counting mechanism. After passing the wheel, the water issues from the meter. Aug. 24, 1881. Price 6d.

- 3,811. H. Hall, London. Tiles for lining or facing walls, &c.

Each tile has a slip or flange along one edge, by which it is secured to the wall. This lip is depressed below the face of the tile, so that the body of the next tile can overlap it, and cover the nail or screws by which it is fastened. Sept. 1, 1881. Price 6d.

- 3,863. G. Johnson, Derby. Ornamental tiles for stoves, &c.

These have a curved surface instead of the usual flat one, and are made by the dry clay process, the moulds being formed with the required curves, &c. Sept. 6, 1881. Price 6d.

- 4,033. W. Wright, Plymouth. Flush cisterns for water-closets.

The cistern is filled by a ball valve, and the discharge-pipe is opened or closed by a valve connected with the handle of the closet. The spindle that actuates this valve, when the handle is lifted and the flush effected, lifts the ball, and prevents any more water from entering. (Pro. Fro.) Sept. 19, 1881. Price 2d.

#### DAMP WALLS.

SIR,—A chapel, built ten years ago, without a damp-proof course or concrete course at the foundation, shows dampness very badly on painted walls. The damp is in all parts, in patches, near both floor and ceiling. The outside has been painted, and the roof loaded at the gable ends. What remedies can be tried yet with a chance of success? D. P.

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.



For erecting a block of offices on the site of No. 32, Finchchurch-street, for Mr. H. C. Moffatt, Messrs. Collier & Merrin, architects:—

C. Wall	£12,200 0 0
Albion & Latta	11,800 0 0
Nightingale	10,387 0 0
Colla & Son	10,050 0 0
Holland & Hanson	10,538 0 0
Patman & Fotheringham	10,519 0 0
Mortier	10,483 0 0
Conder	10,471 0 0
Brass	10,298 0 0
Asby & Horner	10,420 0 0
Perry & Co.	10,271 0 0
J. & J. Greenwood	9,938 0 0
Lawrence (accepted)	9,938 0 0

For rebuilding greenhouses, and heating the same, for Mr. J. J. Jones, Upper Norwood, Mr. C. Fuller, architect. Quantities supplied:—

Wells & Co.	£815 0 0
Chesser	831 0 0
Featherstone	880 0 0
Peters	857 0 0
Sharp	775 0 0
Hart & Co.	769 0 0
Ross & Butcher	765 10 0
C. H. Sharp	761 0 0
Finch (too late)	

For building warehouse in Farrington-road, for Mr. Green, Mr. C. Fuller, architect. Quantities supplied by Messrs. J. Ward & Seils:—

Brown	£2,705 0 0
Peters	2,701 0 0
Brass	2,677 0 0
Mayes	2,656 0 0
C. H. Sharp	2,645 0 0
Featherstone	2,603 0 0

For new residence, Hadley, Herts. Messrs. Brooking & Nelson, architects:—

L. & H. R. Roberts	£1,983 0 0
Grove	1,944 0 0
James	1,825 0 0
Muller	1,815 0 0
Dunford & Langham	1,795 0 0
Boale	1,478 0 0

\* Withdrawn: figures being transposed in error from £1,742.

For alterations and additions to premises, late Surrey Chapel, Blackfriars-road, for Messrs. Green & Son, Mr. W. Hewson Lees, architect:—

Riches	£2,445 0 0
Hoare & Son	1,839 0 0
Reading	1,797 0 0
Parker	1,742 0 0
Rennell Julian & Co.	1,674 0 0
Young & Cochrane	1,660 0 0
Holloway	1,562 0 0
Turtle & Appleton	1,545 0 0
Basley	1,470 0 0
Jennings	1,425 0 0
Wood (accepted)	1,350 0 0

For alterations and additions to No. 5, Jermyn-street, St. James's, for Mr. F. Robb, Mr. W. Hewson Lees, architect:—

Axford	£2,185 0 0
Patman & Fotheringham	2,160 0 0
Hoare & Son	1,970 0 0
Morby	1,900 0 0
Bolding (accepted)	1,859 0 0

For the erection of a house and stabling at Esher, for Mr. W. Game, Mr. John E. Trollope, architect:—

J. M. Macey & Son, London	£1,900 0 0
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For the erection of a pavilion for the Streatham Cricket Club, Mr. John E. Trollope, architect:—

J. M. Macey & Son, London	£180 0 0
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For building stables at Beaufort, Oakleigh Park, Middlesex, for Mr. G. S. Waterlow, Mr. M. L. Saunders, architect:—

A. Dorman, Whetstone	£202 0 0
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For kerbing, guttering, and surface drainage works in certain roads in and near Boscombe and Springbourne, for the Bournemouth Improvement Commissioners, Mr. G. R. Andrews, surveyor. Quantities supplied:—

G. James	£2,014 11 8
Hoare, Bros. & Walsden	1,975 0 0
Sanders & White (accepted)	1,949 16 6

For the erection of a pair of villa residences, Coolhurst-road, Crouch-end, for Mr. V. A. Little. Quantities by Mr. V. Burdett, Mr. C. T. Lush, architect:—

Shacklin & Stafford	£3,696 0 0
Rigg & Son	3,160 0 0
Fish	3,145 0 0
Wall Bros.	3,081 0 0
Timhouse	3,045 0 0
Patman & Fotheringham	2,973 0 0
J. S. King	2,949 0 0
Stead Bros.	2,949 0 0
McCormack & Son	2,847 0 0
Wilson & Brann	2,763 0 0

For roads and sewers, St. Julian's Park Estate, Lower Norwood, Mr. John T. Bessy, surveyor:—

Hill Bros.	£3,261 0 0
P. Pound	3,100 0 0
MacKenzie, Williams, & Co.	3,063 0 0
L. Knight	2,973 0 0
J. Bloomfield	2,970 0 0
W. Ward	2,925 0 0
R. Mayo	2,850 0 0

For building coachhouse and stable for Mr. John Banwell, Weston-super-Mare, Mr. W. J. Spencer, architect:—

S. T. Harvey & Co.	£140 0 0
J. Palmer	137 0 0
W. Marshall (accepted)	118 0 0

For the erection of two pairs of semi-detached villas, in Warrior-square, Southend, Essex, for Mr. James Girling, Mr. Joseph S. Moye, architect. Quantities by Mr. A. F. Wrightson:—

F. & F. J. Wood	£2,535 0 0
J. & J. Greenwood	2,373 0 0
John Grover (accepted)	2,244 0 0
F. & F. J. Wood	2,694 0 0
J. & J. Greenwood	2,461 0 0
John Grover (accepted)	2,300 0 0

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Its construction allows of the angle of light being readily altered so as to reflect in any desirable direction.



# The Builder.

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### Royal Pilgrims and Holy Sites.

It is now some fifteen centuries and a half since a British princess, who became the mother of a Roman emperor, went on pilgrimage to Jerusalem. For 150 years the very existence of that city had been well-nigh forgotten. The Emperor Hadrian had attempted to blot out its very name. He forbade any Jew to come within sight of the place, which he declared to be a Roman colony, under the name of *Ælia Capitolina*. When Constantine overthrew the oracles and temples of the Pagan worship, a temple consecrated to Jupiter stood on the site of the Sacred House. That any tradition as to the identity of any venerated spot, either of the Jewish or of the Christian faith, should have lingered on the ground, may well be regarded as impossible. Certain cardinal features, indeed, had not been obliterated. The Sakrah, or Sacred Rock, which was held to be the centre of the world, on the summit of the Temple Hill, and some of the vast blocks yet remaining *in situ* in the outer wall of that venerable precinct, even if they had been for a time covered with the fragments of the ruins of the city, it was impossible to mistake. Other features, of not less importance as determining the outline and the plan of the Jerusalem of Herod the Great, have been only recovered, by the aid of the pick and of the spade, within the last dozen years. One or two problems yet await the reply which the jealousy of the local authorities has hitherto prevented the scientific English explorer from obtaining. Speaking with all deference to the feelings of those who attach a profound reverence to the supposed identification of certain spots made by the Empress Helena, it is undeniable that the methods of discovery on which alone the archaeologist now relies were not in vogue in her days. By no means that were not miraculous could Helena and her attendants have been assured of the identity of spots since decorated with holy titles. And we are not aware that it has ever been stated that any direct miraculous testimony, of a topographical nature, was thought to be forthcoming at the time of the pilgrimage of the empress.

Royal and illustrious personages, of either sex, members and kinsfolk of the House of England, have trodden in the footsteps of St. Helena, and worshipped in the cathedral reared by her

son. Robert Duke of Normandy, and Stephen Count of Blois, the first a son and a brother, the second a father, of English kings, accompanied Godfrey of Boulogne in the band of Crusaders led by Raymond of Toulouse. Eighty-eight years after its capture by Godfrey, Jerusalem was recaptured by Saladin; and the brief Latin kingdom of Jerusalem came to an end. Four years later Richard Lionheart took the cross in the third Crusade. Lingered on his way, to conquer and to give away the island of Cyprus, Richard at length arrived in Palestine, and, in concert with Philip Augustus of France, took Acre. But he never set foot in Jerusalem, although he burst into tears the only time he came within sight of its walls. In 1248 King Saint Louis sailed from Aigues-mortes in Languedoc. He was followed by 50,000 men, and by 2,800 knights. Of the latter only 100 reached Acre. The king remained four years in the Holy Land. In 1268 he started on the eighth and last Crusade; but on his way he died in Africa, on the morrow of St. Bartholomew, in the year 1270. On the 4th of May in that same year Prince Edward of England, the son and heir of King Henry III., embarked at Portsmouth for the Holy Land, where he hoped to meet the King of France. He did not return to England till 2nd May, 1274, a year and nearly six months after his father's death.

From the time of King St. Louis to that of Queen Victoria the pilgrim has succeeded the Crusader as a visitant of the Holy Land. The very face of society has been re-cast. Christendom has been rent by a mighty schism; Christianity has been rejected, and restored, and is again fiercely menaced, in France. The belief in the efficacy of pilgrimage has now few votaries left in England. But pilgrims still seek the Holy Land in tens of thousands. As a traveller, rather than as a pilgrim, 590 years after the Crusade of his ancestor Prince Edward, Albert Edward Prince of Wales was the only member of the Royal House of England who, until the present year, set foot within the walls of Jerusalem.

And yet, of all this long and illustrious series of Royal pilgrims, it is probable that the youthful Prince to whom the ancient rules of chivalry would accord the title of the Duke of Cornwall, together with his brother, Prince George of Wales, have been the first of their line and kin who have gazed on the tomb of Christ. Without affecting to speak with any certitude on a subject of which the poetic aspect is, perhaps, safer for us to approach than the historic, let us give the reasons for this suggestion.

Jerusalem on the north, without the wall, was surrounded in the time of Titus with gardens and vineyards (Wars, v. 2, 2). Directly to the north of the excavation now called the Royal Caverns, at an elevation of 2,550 ft. above the Mediterranean, is figured in the map of ancient Jerusalem (in Conder's "Handbook to the Bible"), the Beth-ha-Sekilah, or place of stoning. This spot is said in the tract Sanhedrin of the Talmud to have been "without the Beth Din, or place of judgment. It was at a

sufficient distance from the seat of the tribunal which sat in the precincts of the temple mountain, to render it necessary to keep a horseman in waiting, in case any evidence that might cause a reversal of the sentence should reach the judges before the execution took place. The injunction in Leviticus (xxiv. 14) is cited in the Mishna as determining the position of the spot "without the camp." The stone, from which the criminal was precipitated, was "twice the height of a man" (San. vi. 4), i.e., 11 ft. or 12 ft. high. The corpse was hung on a gallows (*Idem*). There is a difference among the sages whether the gallows was a fixture or not. This part of the punishment of lapidation is also based on the Pentateuch (Deut. xxi. 22, 23). A special place of sepulture was provided by the Sanhedrin for the bodies of the criminals there executed. Without insisting on the close relationship between the upright post, or "Ensign," named in the Mishna, with its crosspiece, and the Roman *crucis*, it is clear that there was a close affinity between the Jewish suspension of the lapidated criminal and the more brutal Roman crucifixion. "The Jews of Jerusalem still point out the site at the cliff, north of the Damascus Gate, where is a cave now called 'Jeremiah's Grotto' . . . It is within 200 yards of the wall of Agrippe, but was certainly outside the ancient city. It is also close to the gardens and the tombs of the old city, which stretch northwards from the cliff; and it was close to the main north road, in a conspicuous position, such as might naturally be selected for a place of public execution" ("Handbook to the Bible," p. 356). And the configuration of the ground, and probable course of the ancient roads, are such as to explain the need of a mounted messenger to cover the distance between the spot and the court-house in the temple precinct.

The only link that is here wanting is due to the fact that the Gospels do not expressly state that the crucifixion took place at the usual scene of public execution. But although the technical form of the condemnation by Pilate was for sedition against the Roman rule, the execution of two civil offenders took place at the same time and place. And the reflection has irresistible weight that a Roman procurator who was desirous, as Pilate at that time was, to keep on good terms both with the Sanhedrin and with the common people, would have carefully avoided giving a shock to the most fixed sentiment of the Jewish mind,—the dread of pollution by contact with the body of the dead,—by conducting an execution at any other spot. On these grounds it may be regarded as almost beyond doubt that the crucifixion took place close to the Beth-ha-Sekilah.

It is to that profound Hebrew scholar, and every way estimable man, Dr. Chaplin, of Jerusalem, that Captain Conder ascribes the first identification of the Place of Stoning (Palestine Exploration Fund Quarterly Statement, July, 1881, p. 201). "Another point," says the same officer, "concerning this hillock has been noticed by recent visitors, who have seen



in its outline a resemblance to a skull. This was mentioned to me by the Rev. A. Henderson, but I could not then remember the circumstance. On walking from the north-east corner of Jerusalem towards the rock, I perceived, however, what was meant. The rounded summit and the two hollow cave entrances below do, indeed, give some resemblance to a skull, as may be seen in a photograph taken from this point of view by Lieutenant Mantell, which I now enclose." A print from the photograph is given in the Quarterly Statement.

"Still more interesting," the report continues, "is a discovery which I made about a week ago [7th of June, 1881] of an indisputably Jewish tomb immediately west of the knoll in question. It has only recently been opened, and has not, I believe, been as yet described by any visitor." A minute description of this newly-found tomb follows, accompanied by a plan, for which we refer our readers to the Quarterly Statement cited. The tomb is about 200 yards west of the grotto. It is cut in the rock ("a sepulchre which was hewn out of the rock."—Mark xv. 46. "For the sepulchre was nigh at hand."—John xix. 42). "The outer court, cut in the rock, is 7 ft. square; and two stones are so placed in this as to give the idea that they may have held a rolling stone before the door." ("He rolled a great stone to the door of the sepulchre."—Matt. xxvii. 60. "She stooped down, and looked into the sepulchre, and seeth two angels in white sitting, the one at the head, and the other at the feet where the body of Jesus had lain."—John xx. 12.) The sunken chamber, and the two opposite blocks, as shown on Captain Conder's plan, exactly accord with the above expressions. "On the right" of the entrance, "or north, is a side entrance, leading into a chamber with a single loculus, and thence into a cave" (Quar. St., p. 204). Having made a special study of the tombs of Palestine, Captain Conder is of opinion that the one in question belongs to the late Jewish period, that immediately preceding the Christian era. It is not a tomb excavated by Christians, as they used the "rock-sunk" tomb in Palestine. "No Jewish tomb has been found before so close to the ramparts of the modern city on the north, the next nearest being that discovered in 1873, about 300 yards farther north." Fragments of early Byzantine sculpture and pieces of tessellated pavement were dug up near the spot, and are probably fragments of the old church of St. Stephen, the position of which is another indication of the locality of the Place of Stoning.

The discovery of which we have thus briefly indicated the possible import has caused much excitement in Jerusalem. Nor was this diminished by the fear of the impending destruction of the tomb in the extension of the buildings of the neighbourhood. The monument has probably been hidden, and thus preserved, by the construction, by Agrippa, some ten years after the Passion, of the "Women's towers" on the rock. "And thus," concludes Captain Conder, "the sepulchre would no longer be visited, and in course of time its existence was forgotten, until the zealous Helena destroyed the 'Venus temple on the present site of the Holy Sepulchre Church, and 'beyond all hope' (as Eusebius words it) discovered the rock-cut tomb, which she faithfully accepted as the tomb of Christ." A reference to the beautiful physical map of ancient Jerusalem in Conder's Handbook to the Bible shows that the conditions ascribed to Calvary could by no means apply to the locality of the present Church of the Holy Sepulchre, the site of which is proved by the rock levels to have been within the rampart wall of Acre, or Millo, the North-western Hill. If we pay any regard to the true method of archaeological research, we have, in one case, every requisite for the identification of the spot fulfilled, while there are insuperable obstacles to the acceptance of the other. On the other hand, ranks the judgment of the Empress Helena and her advisers (whatever it may be worth), founded neither on the facts of survey nor on the lingering, or the explanation, of tradition. Let each reader form his own opinion for himself. At all events, the royal grand-children of her Majesty are the first of the descendants of Alfred who have visited the tomb cut in the rock tard by the place of public execution for Jerusalem. One result of signal value has already been secured to the archaeologist by the visit of the royal Princes to Palestine. The Haram at Hebron, the most jealously guarded site in Syria, has been open to their inspection, and thus the next Quarterly Statement of the Pales-

tine Exploration Fund will be enriched by a report from Captain Conder on a spot which the expedition party has long been anxious to penetrate.

#### PICTURES AT THE ROYAL ACADEMY.

The Academy exhibition this year has the advantage,—for such we always think it is,—of possessing one work which is undeniably the central one of the year, the President's "Phryne at Eleusis" (307). There has been an absurd mistake made in a good many quarters, in supposing that this represents the sensational incident of Phryne disrobing before her judges, as an appeal to their clemency. The occasion which suggested the picture is when Phryne was ordered, not by the caprice of an advocate, but as a kind of pious ordinance, to display her figure to the spectators at the sacred festival at Eleusis, as the highest embodiment of beauty. Sir F. Leighton's Phryne is a brown woman,—a colour for which we do not understand the reason, as Phryne was a Greek, and therefore a white woman; and the figure has certainly not much of the texture of flesh and blood: in both these respects it is conventional; on the other hand, the drawing is very fine, the figure and face of a noble type; the combination of the figure with the red and green draperies, the white marble Doric columns, and the deep blue sea beyond, forms a very fine harmony of colour, and there is unquestionably a great style about the painting, which raises it quite above the ordinary prosaic and realistic level of the art of the present day. In other respects, Sir F. Leighton is exceptionally strong this year. In Gallery I. his "Wedded" (71) is a general attraction, and is a beautiful painting in every sense. It represents a moment of tenderness between a wedded pair, the woman throwing back her head on her husband's shoulder, with an expression which is beautifully characteristic of the supposed situation, embodying deep affection in which passion is subordinate. There is something unsatisfactory and puzzling to the eye in the perspective of the sea margin seen through the arch behind, which might easily be ameliorated. In the same room we have "Day Dreams" (56), a figure with a beautiful face and hands, in warm drapery, backed by an Indian fabric; and in Gallery XI. we have "Melition" (1,462), literally the bee, the honey-bearer (for Sir F. Leighton's Greek names to his pictures always have a relation to the subject), a woman with a face of magical beauty, heavily draped in warm cream-toned drapery, with a golden honey-jar under one arm.

Next to the Leighton pictures we should place in interest Mr. J. D. Linton's beautifully-executed work, "The Banquet" (600), one of the series which he is painting representing the life of a soldier of the sixteenth century. We noticed last year the fine feeling and painting of another of the series, where the young knight is being consecrated in the church. The present picture must be thought of in connexion with that to appreciate its significance. Here we see the knight in the gay world, at a Florentine banquet, looking at a dance executed by a girl who seems really to bound in her dancing, as she swings in the air with outstretched arms. The courtly man and beautiful women round the table are each a study in themselves, as well as the minor characters and the accessories. It is one of the most finely and conscientiously painted things that has been seen on the Academy walls. Having mentioned this somewhat exceptional work out of its order, we will now go back to the beginning of things, and pick out the principal figure-subjects of the exhibition, purposely omitting for the present the portraits, which we will look at separately afterwards. Mr. Marcus Stone's "Il y en a toujours un Autre" (5) has the honour of having been purchased out of the Chantry Fund, a selection that gives to the work an importance which we hardly think it would have acquired in the exhibition on its own merits. There is considerable, but rather artificial, finish about it, but it is interesting neither in subject nor in treatment. The two persons are commonplace and characterless. Mr. Pettie makes a considerable show in this room by his two pictures on the line, Eugene Aram discouraging to the schoolboy (18), and "The Duke of Monmouth's Interview with James II." (10), as described by Macaulay. In the first the face of Aram is a failure,—in fact, is not sufficiently made out in its expression, but that of the boy is very good; the second is a clever and successful, but very repel-

lent picture of the abject prostration of Monmouth, whose figure, in its awkward and difficult attitude, is exceedingly well drawn. The king's cold-hearted nonchalance is well portrayed, and it is a pity that the artist did not rest his regate for this year on these two pictures, without adding his large one in Gallery III.,—"The Palmer,"—which is far too large for the subject and most unsatisfactory, and indeed, what we should venture to call dirty in colour. Mr. Briton Riviere occupies a central position with a very picturesque work,—"The Magician's Doorway" (24), where two chained leopards recline in front of a portion of Hindu architecture, apparently studied from the India Museum. Another notable work is Munkaasy's "Avant la Fête du Papa" (64), brilliant in effect, charming in the attitude and character of the children, especially the little one on the floor, but withal harsh in colour and ultra-prosaic in aim. Among other works in this room may be mentioned "Phyllis" (11), by Mr. T. G. Gotoh; "A Fugitive Thought" (50), Mr. Marks; "The Burgomaster's Daughter—Skating Costume, Seventeenth Century" (63), Mr. Boughton, in which the costume is more thoroughly painted than the face; "Dolce far Niente" (78), by Mr. Perugini; and "La Brodeuse" (94), by M. Fantin. The landscapes, as well as the portraits, we defer speaking of for the present.

In Gallery No. II. is the smaller of Mr. Croft's battle-scenes, which are now among the annual incidents of the Academy; "A Pause in the Attack, Hougoumont" (102), in which, to say truth, some of the figures seem too much as if suggested by Mrs. Butler's "Quatre-Bras." Mr. Val. Prinsep's "At the Golden Gate" (163) is a curious example of an ideal subject expressed in a most realistic manner; from the broken lamp on the floor the idea of the parable of "the foolish virgins" seems to be intended, but the young woman listening at the door is neither ideal nor dejected, but "fat and well-looking," and the door is a copy of a well-known Moreau metal design. Mr. Joseph Clark's unaffected realism in "Walls and Strays" (151) is interesting; this is a feeding of street children with philanthropic intent; the faces of the children, and their varied phases of interest in the proceedings, are well studied. The new Associate, Mr. Woods, sends a curious work, "Bargaining for an Old Master" (182); Mr. Woods dates, we perceive, from Venice, and his style is not English: the picture is a bargain with a street bric-a-brac dealer, who is backed by a mountain of pots and pans, painted with care and brilliancy. A somewhat similar class of work, also clever but "loud," is "Luncheon Time in Venetian Sartoria," by Herr Val Hensen (176).

Gallery III. contains, he it said, not a few of those canvases, obscurely glanced at by the President in his after-dinner speech last week, of which the size in square feet is totally disproportionate to the artistic value or interest. These we will pass, mindful of the restriction of our own space. Mr. Poynter's one half-work, "In the Tepidarium" (234), is a nude study in nearly the same manner and attitude as that in his diploma picture, "The Fortune teller," which was in a former Academy exhibition, but perhaps not quite equal to it. Mr. Mark's most important picture, "Lord Say brought before Jack Cade" (242), is one of the best things he has done. The calm and half-contemptuous bearing of Lord Say, a thin elderly man in long green mantle, is evidently a puzzle to Cade's boorish followers, who cannot tell what to make of him; and the indifference of his attitude and manner in Cade, in spite of his clenched fist, shows that he, too, is cowed to some extent by the superior spirit of the man whom he is insulting. The picture is effectively grouped and full of character. Mr. Orchardson's peonies, "Honeysuckle in the Honeymoon" (235), and also, in the face of the wife, his characteristic and regrettable carelessness about the modelling of his faces. A good specimen of Mr. Paed (241) is exhibited in a scene representing an small child getting dressed for out-door walking by two women. Mr. Leslie shines in two single-figure pictures, "Molly," and "Sally in our Alley" (281, 282), which make a pleasing contrast, one sad, the other cheerful, on either side of one of the doorways. Mr. Leslie's likeness, standing up in the punt with which he has familiarised us in his charming book about the Thames, is to be seen in a portrait group of artists and amateurs



by Mr. Wells, under the title "Friends at Yewden" (261), a somewhat hard painting, but one in which the likenesses are evidently carefully studied. Among pictures of more poetic aim, Mr. Collier's "Clytemnestra" is predominant (272); she appears coming from the tent after the murder, axe in hand; the face is cruel and repellent enough for the character; the details of ornament of the curtains, the dress, and the long-handled axe, are very carefully painted; the crimson robe in which the figure is clothed from the waist is rather a harsh element in the colouring, nor can it be said that the picture rises to the tragic interest of the subject; but it is a fine attempt, and promises more for the future. Mr. Frank Dicksee's "Love Story" (290), is open to the same comment as some of his previous works. It is of more interest as a study of effect,—moonlight effect in this case,—than for the figures themselves individually considered. There is just a touch of the theatrical about it; it is a stage love-scene, well composed and lighted. "The Wild Swans" (270), by Mr. John Scott, a subject from Hans Andersen's tales, representing Ella carried through the air in a net of willow-wands by swans, has evidently been chosen for the sake of the swans, which are admirably drawn and painted. The figure is stiff in attitude and hard in painting. Mr. Long is represented in the same gallery by a large painting of an Eastern interior, under the title, "Why Tarry the Wheels of his Chariots?" (302). The figure on the floor, with her back to the spectator, which is repeated from a previous work by the artist, is one of the best pieces of drawing in the exhibition; but the picture does not really illustrate the subject. It is an academical picture, for which twenty other titles would have fitted as well.

Mr. Le Jeune's small and unpretending work, "The Little Angler" (329), in Gallery IV., representing two children by the side of a stream, is a charming specimen of truly artistic work, giving interest to a simple subject by dint of perfect execution and harmony of design throughout. It is instructive to compare this careful and delicate painting with the harshly-painted though clever works by some foreign artists which find place on the line in various parts of the exhibition. Two of Mr. Boughton's Dutch scenes find place in this room (342 and 363); the elements and tone of both are very similar; they are very pleasing and harmonious works, but their harmony is attained rather by the omission of detail than by completeness of treatment; the effect is a delicate but a decidedly conventional one. "A Venetian Convent in the Eighteenth Century" (370)—a girls' school, in fact,—by M. Eugène de Blaas, is a clever piece of character, especially in the face of the old nun who, like a cat watching a mouse, listens while one of the girls talks to a male visitor through the grating. Mr. Morris's "Sale of the Boat" (417) is a work of some interest. Mr. A. Moore repeats a charming but almost worn-out decorative effect in his "Dreamer" (407), very pleasing if one had not seen so many others just like it. A small work, by Mr. G. C. Hindley, "Suspicious" (401), should be looked at.

In Gallery V. there is but little among the figure subjects that is interesting. Mr. Reid's "Homeless and Homeward" is the most important work of its class (476); an old motive, the contrast between vagabonds and those who have a home; but the intended pathos of the work is weakened by the very healthy and well-developed figure of the young woman among the strolling musicians; the execution of the picture is excellent. Mr. Walter Field's "Persecuted, but not Forsaken" (448), a preaching meeting of Puritans on Hamstead Heath in 1687, is rather more of a landscape than a figure painting; but its expression consists partly in the gloomy and melancholy appearance of the evening landscape, which seems quite in harmony with the subject. Mr. Horeley's scene on the deck of a passenger-steamer (523) where a faithful Mussulman is offering up his prayers in the midst of a critical audience of various nationality, though very hardily painted, exhibits a great deal of clever portraiture of character and manner in the various passengers.

"The Favourite"—1666" (628), in Gallery VI., is one of the largest and most important works which Mr. Seymour Lucas has produced, though not so interesting in subject as some previous ones. It is the interior of a large wainscoted room where several gentlemen are awaiting the entrance of "the favourite," who is just stepping through a doorway facing the spectator. It is

an admirable and solidly painted picture, but there is not sufficient point or expression in the countenances and general behaviour of the personages to suggest their feelings or their part in the scene. Mr. Calton Woodville's "Maid and—Saving the Gans" (567) is a spirited battle-picture, and the best which this painter has exhibited. Mr. Val Prinsep's large painting of the "Death of Siward the Strong, Earl of Northumberland" (558), is noticeable as a revival of the old style of "historical painting," which is not often seen now, and, to say truth, it has something of the unreality of a regulation historical painting; it does not take us back to the time it represents; the woman who kneels before the old Earl is, in fact, a modern lady in masquerade. Mrs. Jopling's illustration of the old subject of "An'd Robin Gray" (572) shows a good deal of pathos, and is entirely uncontained in treatment.

Gallery VII. contains some very clever works of exceptional character, conspicuous among which is Mr. Chevalier's "The Convalescent: Interior of a Buddhist Monastery, China" (688); this is not an interior in one sense, it is a terrace scene, where a yellow-vested priest reclines with his legs stretched on a chair before him; beyond is the garden and its green vegetation under the glare of a hot sun; the figures are full of character, and every part of the picture is finished with the greatest care and brilliancy. An interesting study or restoration of Indian architectural detail is given in "Ajanta Caves, A.D. 600" (660), by Mr. J. Griffiths; the strong and brilliant polychromatic decoration is painted with much force. Mr. Long's "The New Fugue" (678) might, we suppose, be ranked as a portrait, though not called so; it is the life-size figure of a fine young woman, in a swan's-down tiptop and black silk dress, seated at an organ; it is an admirable piece of execution in every part, not least in the painting of the large metal pipes and all the details of the organ; but by a slip in the perspective the player appears to be at the side and not at the centre of the key-board, and is playing with both hands on the lowest octave, which is not the method usually adopted. Miss Hilda Montalba's "Misty Day at Venice" (679) is a clever and original work; Mr. Arthur Hill's "A Dancer" (701) an admirable nude study both in drawing and colouring. Among other works in this room may be mentioned Miss Robinson's "The Visit" (704), two little girls of girls playing propriety on two chairs; Mr. Geo. Reid's "A Publisher at his Desk" (717); Mr. Seymour Lucas's "Disputed Strategy" (745), an argument between two soldiers over a map, a capital little painting; Mr. Carl Schloesser's "Pianissimo" (746), a caution from a singing-master to his pupil; and Miss Jenkins's "The First Kiss" (752), a very pretty picture of two children engaged in precocious love-making.

Why Mr. Dendy Sadler's apparently very clever work, "Friday" (784), as "fast-day" dinner in a monastery, should have been skied as it has been, we see not; far inferior works are certainly on the line in the same room. Miss Alice Havers exhibits a very pleasing work entitled "Trouble" (801), exhibiting the concern of a humble household over a child who seems to have been suddenly taken ill; the mother's face is very expressive in its mingling of maternal concern and business-like ordering. Mr. Eyre Crowe's large work, "The Defence of London in 1643" (840), is to be looked at with respect, of course, but we do not think the artist is as successful on this scale as in the smaller class of works in which he made his reputation. Gallery XI. contains one of Mr. Arthur Hughes's refined and thoughtful works, "The Skipper and his Crew" (1529), the crew consisting of the wife and little ones saying grace over their meal; there is beautiful colour and feeling in this picture, though it looks a trifle peculiar at first glance. Mr. Long's diploma-work, with an unpronounceable name, "Nonzhatal-doudad" (1493) is in this room; it is a fine study of the head of a dark-skinned woman. Mr. Briton Riviere has a "Una and the Lion" (1432), in which the lion is splendid, but unfortunately Una is quite below the mark. We should not have passed over, by the way, his diploma-work in Gallery V., "The King Drinks," a lion drinking at a pool. Mr. W. Legdall, in "Orders" and "Buying and Selling on the Rialto" (1528-30), as well as in some smaller works, exhibits very good painting of architecture.

The Lecture-room is now a Sculpture-room, showing the sculpture with a top-light, for

which sculptors may well be thankful. The old sculpture-room becomes a picture gallery, with the light altered to a top one. This is a great improvement; the sculpture-room, as it was, was a ridiculous situation for the best of most of the works placed in it. We shall return to the pictures in another article, only observing in the interim that the exhibition impresses us in the main as a decidedly strong one.

#### THE GROSVENOR GALLERY.

Or the style of works which have been hitherto most especially characteristic of the Grosvenor Gallery Exhibition, there is this year a smaller proportion than usual, and the general impression created by the exhibition is somewhat different from that which those of previous years have produced. It is not made of previous years for the display of the thin women with long oblique and melancholy faces who form the ideal of beauty with the artists of the "Intense" school. Without denying that in the collections in this style by one painter, Mr. Burne Jones, there was much beauty of execution and of colour, and even a considerable, though very monotonous, beauty of idea, we consider it, on the whole, satisfactory that this important annual exhibition should show symptoms of a wider extension of its sympathies, and should be less of the place of expiation of a clique.

Taking the figure-pictures first, the two largest, and in many respects the most important, are Mr. Burne Jones's "The Veil of Forgiveness" (144), and Mr. Julian Sturgis's "The Entombment" (51), and a curious contrast they afford. The former is the attempt to bring out in visible form the legend of Phyllis and Demophoon, of the sudden blossoming again of the human form of the nymph from out of the tree into which she had been metamorphosed, as her lover passed it. We presume this is a repetition, on a larger scale, of a work which was exhibited a good while ago at the Society of Painters in Water Colours, which we did not see, but which was removed from the walls as giving offence to the respectable Philistine; a transaction which was accompanied, naturally enough, by the withdrawal of the painter himself from the Society. In its way this is a fine and passionate work, no doubt, but it serves to illustrate the danger of treating legends of this kind in painting; for that which will very well bear to be told in poetry may become absurd when reduced to the realism of painting. In this case the bursting open of the tree-trunk and the protruding form of this full-length figure, which we feel could never have been packed inside it, produces a ludicrous effect, in spite of the serious intention, and reduces a poetic legend to a "too solid" prose. As a painting of the figure, it is superior to much of the same artist's figure-painting. "The Entombment," to which we have referred, is a painting of (in one sense) considerable power, representing two or three men descending a rocky path and bearing in their arms and on their shoulders the pale foreshortened figure of the dead Christ. As drawing and painting, it is a work of no common power, but we cannot congratulate the artist upon it. His object seems to have been to reduce the history of the burial of Christ to the plainest and even brutal realism; to treat it as divested of all attempt to render it solemn, pathetic, or impressive. We cannot consider that painting is worthily employed in thus lowering a subject connected with so many solemn and pathetic associations to the level of a mere clever representation of men carrying off a dead body,—it may be that of any one,—without any circumstance of reverence or decorum of any kind. It is a disagreeable picture to see, embodying a coarse and commonplace view of the subject it treats.

Of Mr. Whistler's contributions, his so-called "harmony in flesh-colour and pink" (48), of which we do not see the flesh-colour, is nevertheless, in its peculiar style, a graceful and pleasing portrait, more remarkable for the elegant pose of the figure than for the colour, after all. Other portraits that are here from the same hand are better passed over. Mr. Tadema sends five small works, of which "Early Affection" is, perhaps, the most noteworthy (54). The title is merely derived from the incident of a child pleased with a doll in the foreground. The picture is really a Roman garden-scene, brilliant with bright flowers, and sparkling with light. A marble terminal figure of Pan rises in the midst of the flowers, another white statue gleams through the trees in the



background. "An Audience" (61) shows the beautiful profile faces of two or three Greek girls. The portrait of "Hans Richter" (59) is an admirable specimen of realistic and highly-finished portraiture, and the artist has found another portrait subject exactly to his mind, that of "Herr Ludwig Barnay as Mark Antony" (55), in the midst of his speech, we may suppose, over the body of Cæsar. The face is not that which we should imagine for Antony. The manner of the actor, both his hands pressed to his bosom, is admirable, and the dress and all the accessories, are, of course, thoroughly Roman.

Mr. E. B. Browning's large work, entitled "Labour" (8), cannot be passed over, as the work of a young artist who inherits a great name, and has already shown the ambition to excel in more than one class of subject in painting. The picture is a life-size representation of a young woman of the strongest type of "rude health," coming home barefooted from the field-labour. It is a hardly-painted realistic work, with little sentiment in either the figure or the landscape, and the feet are very clumsily drawn and modelled; yet there is evidence of a power and determination about it which may be the promise of much finer work in time. Mr. Walter Crane's allegorical picture (36) of an angel pleading with Time on his throne for an obliteration of the past, is marked by fine and serious feeling, and is more intelligible than many allegorical pictures; it is very hard in texture, however, and the kneeling figure is not satisfactory in drawing, and certainly not beautiful as a figure. Mr. W. B. Richmond's "Release of Prometheus by Hercules" (57) represents two life-size figures, Prometheus reclined on the rock, and Hercules gazing up after the arrow which he has shot at the vulture. The avenging bird does not appear in the picture: only a feather from it drops across the sky. This is a fine and animated painting in itself, but it is characterised by an effeminacy of manner which is out of keeping with the grandeur of the subject, and by which Mr. Richmond and others of the new school who delight to paint subjects of Greek legend seem to us to weaken the character and ideal of the figures they represent. These are not Prometheus and Hercules; they are figures that are Asiatic rather than Greek; they are sentimental instead of being grand. A practical defect in the Hercules figure is that the foreshortening of the legs below the knee is not perfectly conveyed, and the figure seems balanced insecurely in a feeble and scarcely possible position. Mr. Heywood Hardy's "The King's Daughter" (65) is really a picture of gazelles, capotally painted, fed by a damsel who is not nearly so well drawn, and who has nothing regal about her. Mr. Gregory's "A Rehearsal" (79) is an exceedingly clever and well-executed small painting of a lady and gentleman in evening dress, who may be supposed to be rehearsing a piece for private theatricals; the lady's figure is very graceful and pointed in attitude and expression. Another picture under the same title is exhibited by Mrs. John Collier (103), a garret scene with two children practising a dance; no doubt this is intended as a portrait of the children; as a mere picture it might be said to be unnecessarily large for the interest of the subject. Mr. P. R. Morris gives the title of "The Sirens Three" (104) to a capital painting of a pier scene with three stout and comely fisher-women in the foreground, a much superior work to his "Passing the Bridge" (32), which has for some reason been more prominently hung. In the East Gallery, Mr. Burne Jones's "Feast of Peleus" (157) is a fine piece of classicism on a small scale, and beautiful in colour; a larger work, "The Mill" (175), is also fine in colour and utterly inexplicable in subject—three lack maidens in close-clinging garments dance sadly round as if they were doing it in a dream. Mrs. Tadema's charming little interior, with a figure, "Granny's Needle" (163), should not be passed over. Mr. Walter Duncan has a repetition in oil of his "Girce" (19), which we noticed in connexion with the Society of Painters in Water-Colour; the present edition is superior to the water-colour one. Among other pieces of classicism is an exceedingly clever little thing by Mr. Weguelin, "Habet" (159), a naked Roman lady on the steps of a bath, who has knocked over an intruding tortoise with her strigil; the picture is a most frank and unconcealed imitation of the style and subject of Mr. Tadema, though with a very different manner of execution in the flesh-painting, which is, however, admirable in

texture, though perhaps a little too pink in colour. This is, however, one of the best bits of painting in the gallery. Another second-hand inspiration is that of Mrs. Arthur Muroh, "A Sleeping Girl" (102), a palpable rivalry of Mr. A. Moore, and a very clever piece of work. Mr. A. Moore has one of his own damsels in the East Gallery, "Asclepias" (113), in almost exactly the same attitude, only rather less thinly draped. Lastly, and in absolute contrast to this class of work, is Mr. Holman Hunt's painting of one of Farmer Flamboy's daughters, as they were said to have been painted, each "with an orange in her hand"; a little girl with a lamb beside her. The orange furnishes the suggestion for a fine harmony of colour between that and the light blue frock and the coral necklace. The face is finished with the greatest minuteness, but, alas! it is wood, not flesh: the breath of life is not in it; every tuft of wool on the lamb is separately modelled, but the lamb also liveth not. "Take care of the details, and the whole will take care of itself," is a maxim which will not put life into painting, with what power soever the details be painted.

Among the portraits there are strange contrasts, even among works by the same hand. Mr. W. B. Richmond (whose industry and power of work seem, by the way, quite phenomenal) sends a masterly head of Mr. Browning, excellent withal as a likeness; others of his portraits, "Mr. Lowthian Bell," for instance (194), and "Miss Clough," the lady president of Newnham College (229), are excellent: while his large portrait of Mr. Gladstone (77), in scarlet robes, suggests the idea that it has been inspired by political hatred of the premier and a desire to hand him down to the ridicule of posterity: the flesh tones are those of a corpse rather than a living man, and the expression of the countenance perfectly wild. Mr. Millais is not doing justice to his splendid powers in so slightly executed a work as the portrait of "Mrs. Whibly" (88). Among works that are thoroughly satisfactory are Mr. Collier's fine full-length portrait of "Mrs. Collier" (52), and Mr. Val. Prinsep's "Mother and Daughter" (39), a fine firmly-painted group which might be called a study in reds, set off by the low green tone of the girl's dress in the background. Sir Contts Lindsay's portrait of Mrs. Holford is a good and characteristic one, and we may say the same of his corresponding picture of Mr. Holford (127). Mr. Boughton makes a pretty and successful hit in portraiture in his figure in "An Autumnal Ramble by the Spey,"—portrait of Mrs. Priestly (76), which is really a landscape with a small portrait figure introduced in it. Mr. Watts's large full-length portrait of the "Prince of Wales" (63), painted for the Middle Temple, is a good specimen of what may be called ceremonial portraiture, but we do not think the painter's interest in it has been very great; artistically, the head of "Sir C. Brodie" (120), is of much higher interest. Mr. Millais is at his best in the beautiful portrait group of "The Children of Mrs. Barrett" (83), hung at the top of the principal room, a very highly-finished work, equally grateful to the eye in composition and in colour.

Landscape has never been the strong point of the Grosvenor Gallery, and there are works hung this year which we should stigmatise as very bad landscapes; but there are some of great excellence. Among the foremost of these is Mr. J. W. North's "Autumn Days" (71). Mr. North is no doubt a mannerist, as we have before said, but it is a most brilliant and original manner, and he has done nothing better yet than this large and elaborately worked landscape, full of multiplicity of detail, over which, nevertheless, light and atmosphere predominate. In a very different way Mr. Hem's "Oporto, from the Sandeman Wine Lodges" (100), is as much to be admired, and is architecturally interesting as a very careful painting of a mass of buildings. Mr. Boughton's "Weeders of the Pavement,—a Grass-grown Port, North Holland" (45), is both a figure and landscape picture, interesting in both senses. Mr. Hennessy's "Spring, Calvados" (81), is a very bright, fresh thing, and is really like spring; some works that we see representing spring seem to imagine spring atmosphere as a general greyness and absence of sunlight. Mr. Cecil Lawson's "Storm Cloud, West Lynn" (30), is forcible, but he is a painter who constantly reminds us of others who have preceded him. There is a good deal to admire in Mr. Keeley Halswelle's "Shooter's Hill" (33), but it is unfortunate as

a composition; sky, bank, and water, dividing the picture into three nearly horizontal strips.

In sculpture there is a pretty life-size "Hero," by Count Gleichen, in the corridor; a realistic group in terra-cotta by Mr. E. R. Mullens, "Home Treasures," which is very graceful; and a bas-relief by Mr. Legros, "La Source," very much the same motive as Ingres' celebrated painting. The feet of the figure disappear as if lapsing into the rivalet which is supposed to flow from them,—that we take to be the intention; the effect is unfortunate. Among the paintings we have omitted to mention a very sweet head of a child, "Zeyra," by Sir F. Leighton (53), a beautiful bit of colour, too; and a half-length portrait of a lady by the Princess Louise (73), which, though rather sketchy in execution, is animated in expression and very forcible in colour, and is the work of an amateur of true artistic feeling. Lady Lindsay has several frames of her graceful pictures of flowers, and a forcible head titled "Little Red Riding Hood."

#### THE OPENING OF THE PARIS SALON.

It is merely a coincidence of the calendar that this year the Royal Academy in London and the Salon in Paris both open their doors on the same day; for it is only when the first Monday in May, the traditional opening-day of the Royal Academy, and the 1st of May, that chosen for the opening of the Salon, come together, that the two exhibitions are thrown open simultaneously. Both events, both exhibitions, hold in their respective capitals exactly similar positions, though we suspect it will be found that there is a more wide-spread,—we will not say perhaps more genuine,—interest felt in Paris in the Salon than is expressed in London as to the Royal Academy. It is one of the sights which no one who wishes to know Paris, or, as we are beginning to say now, to respect himself, should fail to see, the Sunday afternoon of May, or June when the public are admitted free,—fill within a year or so there were two days in the week,—the long queue of visitors winding round the Palais de l'Industrie from the morning till late in the afternoon, a huge army passing steadily through the rooms, hour after hour, pouring out into the Champs Elysées all day long, laden with dogs-eared catalogues and confused recollections of acres of canvas and tons of sculpture. The *jour de vernissage* is no less a sight,—the vanishing-day—such as we understand it in London, and private-view day also. If the crowd is more select, it is scarcely less dense than on the free days, and if, as happened this year, the afternoon is a brilliant one, it is a scene never to be forgotten; all the afternoon group after group pouring out into the Champs Elysées, where pink catalogues,—they are pink this year,—are tucked under almost every arm, flanked by bound and unbound volumes of illustrated and various other catalogues; the open-air *cafés* of the neighbourhood crowded with more pink catalogued, thirsty, dark-covered visitors, who have been hard at work picture-seeing and hand-shaking all the morning; carriages driving away with the more fashionable visitors, and all surrounded by the gaiety of bright green trees and horse-chestnuts in full bloom, pretty faces, pretty dresses,—very sombre and discussion, and the silence of hope and disappointment. In some respects very like, in others very different from, what is to be seen at Burlington House. There the private-view day is sacred, vanishing-day professional, like the press-day, opening day like any other, and Piccadilly very different to the Champs Elysées, and the cold week in May very likely to be in full force. But it is the Exhibition, not the aspect of opening day, that is the most important.

It is certainly not in Paris that one feels that the painter's or the sculptor's art could be regarded as in a sickly condition, and when it is stated that the present Salon contains 2,722 pictures distributed over twenty-nine rooms, we think at least that we are justified in our opinion. Not that numbers indicate invariably strength; if so, what is to be said of the refusal at the Royal Academy of over 4,000 pictures!

If the Salon this year is scarcely less free than in former years from that mass of crude rubbish that encumbers, and has so long encumbered, exhibitions of works of art, it is no fault of the organisation and management, which, as our readers have had explained to



them, was, now two years since, thrown by the Government entirely into the hands of the artists themselves. Exhibitions such as the *Salon* and the Royal Academy would be deprived almost entirely of their interest were they not thoroughly representative as a whole of the contemporary tendency of the national art, and the tendency noticeable this year at the *Salon* is unquestionably in the direction of what we have come to understand as realistic art. The public, perhaps the world,—those, at least, and they are now a vast multitude, who seek mere amusement and enjoyment from pictures,—are to be thanked for the growth of this realistic art, an art which, after all, appeals especially to the thoughtless and those whose respect for the past is immature. How is it, it may be asked, that as our refinement and culture advance, we seem to seek more greedily mere amusements in directions where formerly elevating influences and matter for reflection were sought? To the highly-informed,—the upper ten-thousand in art, who formerly were represented by a limited number of individuals known as connoisseurs or *dilettanti*,—it must ever be a source of regret that what is understood as poetical or romantic art is no longer the most beloved, and yet, in all cultivated circles, it is the art most ultra representative. In Paris, we learn that the ultra representative of this school, M. Puvion de Chavannes,—the *Watts*, in a measure, of France,—has not only been accorded a place of honour for his large and grandiose work, "*Ludus pro Patria*," but it is more than probable that it is to him that will be awarded the annual medal of honour; we are not ourselves admirers of the artist, and in this respect we almost regret that we share the opinion of the public, but the art the painter represents and its tendencies are paid homage to.

It is also to be remarked this year that what the French, and we sometimes, term *genre* or "incident pictures" are also less in vogue; painters very properly appear to be giving up that minute research into historical costume and would-be accuracy obtained, as has been the practice, chiefly from theatrical and similar sources; they are relying now with a faith that seems to us promising for the future, more on the wonderful truths and beauties of nature. At no time more than at the present has this close observation of the model, and the scientific study of the all but endless harmonies of colour and contrast, been more conscientiously and warmly considered. But as the worst phase of this realistic tendency, it is really with sincere and unaffected pain that we observe in this year's *Salon* more than ever of those offensively addressed figures that have so long supplied the ambition of artists with the idea of emulating Titian and Rubens; but even Rubens, who is opposed by some to have selected very vulgar specimens of the human form for the exercise of his marvellous power, never by any chance painted such forms as the modern French artists appear to delight in.

The sincere lovers of pictures have reason to complain of the flood of painted canvases that have overwhelmed the selecting committee at the *Salon*; and again, as in the case of the Royal Academy, the disaffected artists, the outsiders, and their friends, are sadly complaining. In Paris, however, there seems more attention and more time given to the task of selection, and as far as we know, of the two systems we are inclined to prefer that pursued in Paris. There the process is something as follows:—The selecting committee once formed, its ninety members, termed *jurés*, having been allotted for some weeks since by the whole body of Parisian artists,—the council, as we term it, meet on each of the days appointed, in the *salon carré*. The president opens the meeting when the whole body, preceded by two *xiers*, immediately commences to walk through the rooms, past a raised table running round the walls at elbow height, on which have been placed the more important pictures. The two porters hold a card at about 6 ft. or so from the canvases; on one side of this card is the president, the other his colleagues. The voting is titled by show of hands; in case of doubt there is a second show of hands; and if still the matter is not settled, a definite decision is deferred till the evening. The picture is either fussed, it is doubtful, or it is admitted with a number, number one giving a right to a "see" "on the line" in the centre of a panel; number two, to a place still "on the line," but near a door or in a corner; with

number three, the picture commences to be "skied," and for the picture without a number its fate is in the hands of the porters. The smaller pictures are examined in a more simple manner. They are placed on a huge easel able to show ten or more pictures at a time. The head-porter calls them out in alphabetical order, and the "jury" or council examines and decides. In the evening it is the turn of the doubtful pictures; and this is the time when friendship is able to save many a work from rejection; but even after this second "sentence" there remains one hope more, that of the so-called "*revision générale*," which takes place at the close of the council's sittings, when all the pictures have been examined. The hanging then immediately commences; the important pictures are got rid of in the entries, vestibules, and large rooms; the pictures of smaller dimensions following until everything has been well "fitted in." The hanging is entrusted to a special commission; another commission sees to the furnishing and general arrangement of the rooms; another prepares the catalogue; and a fourth sees to the all-important distribution of tickets, &c. In many points, it will be seen by those familiar with the Royal Academy system, to bear a close resemblance to that adopted at Burlington House. There is, however, we think, less possibility in the French system of merit being overlooked; it has long been a matter of calculation that such pictures submitted to the council of the Royal Academy barely receives on an average the examination of a third of a second. If, however, it be said that the results attained by the French authorities are not so far superior to those of their English brethren, it is the fault rather of the artists themselves, and certainly never has this fact been more startlingly proved than in this year's *Salon*.

Although there are but 151 architectural drawings, they not only completely occupy the walls of two large rooms set apart for their special display, owing to the size and importance of the drawings, but a very large space is occupied by the architects on the walls of the exterior galleries, some of which drawings we shall hereafter particularise. The sculptures this year seem even more numerous than usual, but so far, just as with the pictures, we have not heard of any single work likely to make or greatly increase a reputation.

Paris.

#### A PRIMER OF ART.

THIS, which is one of Messrs. Macmillan's series of shilling primers,\* contains a great deal of plain, good sense on the subject of artistic study, concentrated in a very small compass. The object of the book is to put before those who are commencing the study of art some general guiding principles in regard both to practice and theory, and to lead them to consider in the first place what is the meaning and aim of their study. In the course of these suggestions Mr. Collier occasionally, however, goes out of the beaten track to say a word in season upon some vexed questions in regard to art which have been the subject of much discussion, and on which he occasionally has something both good and original to say. In regard to realism, for example, Mr. Collier rightly scouts the idea that the power of painting with the highest realism can be anything but an advantage to the artist. With modern materials there is possible, Mr. Collier observes, an art of painting in which nature shall be reflected as in a mirror, wherein those who cannot see nature for themselves shall be taught to see and love her through the eyes of others. This is, perhaps, putting it a little too strongly and literally; still there is no doubt possible that degree of imitation of the effect of nature which may convey to us all the main facts of nature, with occasionally something approaching to illusion. It is sometimes objected that the mere imitation of nature is a low and degraded aim, "that what is valuable in the picture is insight into the mind of the artist, and so on, and so on," says the author, a little contemptuously. His reply is that realism is not the sole aim of art, but that it is a very important one in itself, and that it is a power without which the higher power of imagination is practically valueless.† "The imagination has to express itself somehow, and the more mastery the painter has

over the means of expression the less trammelled will be his imagination." It may be that a painter may choose, for reasons connected with the object and intended position of his design, to conventionalise the details of the figure, for instance, and to leave out some of the details and of the life-like expression of nature; but let it be because he chooses, not because he has not the power to come nearer to nature,—a simple principle sometimes lost sight of. Indeed, Mr. Collier implies elsewhere, and we concur with him (if indeed we have not said the same thing in these columns), that much of what is regarded as conventionalism in ancient and Medieval art was intended as naturalism, and was only the result of imperfect tools and imperfect methods which did not permit of those who aimed at imitating nature doing so in any but a very rough and imperfect manner. The idea of realistic colouring of sculpture, however, Mr. Collier entirely opposes (though admitting that the Greeks practised it), on a ground which is in accordance with what he elsewhere says in favour of realism, viz., that genuine realism is unattainable in sculpture, owing to the impossibility of simulating texture in such materials as are available for sculpture.

In regard to the question of outline, Mr. Collier attacks the idea that there is no such thing, properly speaking, as outline, which has been sometimes maintained. Objects are not bounded by a line in the material sense of a dark mark, but they are bounded by a line in the Euclidean sense of length without breadth, a boundary formed by the contact or apparent contact of two substances of differing tones or colours, and the right delineation of this boundary is a line, the outline, though in using colour this may be and should be eventually defined without any recognisable line. Where colour is not used, the outline is the only available means of defining the boundary whereby the figures are determined. This appears to be the common sense of the matter. Mr. Collier's short chapter on perspective is admirable; it goes to the root of the matter, and shows the simple method of understanding it, sufficiently for practical purposes, without long words or complicated diagrams, which are only so many re-applications of the same theory. We are not sure, however, whether Mr. Collier does not go too far in his simplification tendencies, in describing the study of anatomy as only "a slight aid to the direct observation of nature." It is surely more than that. It may be true that too much learning in this direction tends to induce painters to introduce what cannot actually be seen, because they know it is there; but, on the other hand, there is surely no greater help towards painting correctly the external forms and changes of the body than to know accurately how they are caused. If we go further and say that it is impossible to do it without such knowledge, Mr. Collier may, no doubt, bring forth the Greeks against us, of whom he says that it is certain they knew next to nothing of anatomy. Is it so certain? At all events, the Greeks were sculptors, and the sculptor may perhaps study better from the mere outside than the painter, who has not to reproduce the modelling of nature, but has to indicate very slight variations in modelling and in the action of muscles by very slight gradations of colour and shading, a branch of art in which it seems necessary to know the meaning or intent of every touch, even more than in sculpture.

The chapter on colour, including remarks and diagrams illustrating the structure of the eye, is most useful and suggestive. Some readers may ask what this has to do with painting, and no doubt many artists have painted fine pictures without knowing anything of the physics of colour or of vision; yet we cannot think that a knowledge of how we see colours and how they affect the eye can be without its effect on the method of a thoughtful painter. Mr. Collier, of course, does not omit to draw the distinction between mixing colours and mixing or combining coloured light, the ignoring of which for a long time was the cause of the theory, now abandoned by scientific men, of blue, red, and yellow being the primary colours, these being the colours which cannot be produced by mixing pigments. Dealing with coloured rays only, the primaries stand as red, green, and violet, and the combinations of these coloured rays are materially different in their results from the combinations of pigments of the same tint. The excuse, if one be needed, for introducing these and other scientific considerations into a primer on art, is contained in the sentence at the conclusion of the chapter on "Contrast,"—"My earnest

\* A Primer of Art. By John Collier. With illustrations. London: Macmillan & Co., 1882.

† This falls in well with what we expressed as to the late Mr. Rossetti's paintings on p. 489, ante.



advice to all art-students is not only to practise their art diligently, but also to seek to know as much about it as they can."

The reason why it is possible to represent the effect of a bright sunlight in a landscape painting, although the painter has nothing positively brighter than the reflected light from white pigment to work with, though of course obvious enough to any one who thinks about it, is better put than we have ever seen it put before. The secret lies, of course, in observing the balance of proportionate light over all the objects, and avoiding the painting of detail in the shadows which, in looking at nature, would be lost to the eye in the general strong light of the whole scene.—"We will suppose that the artist is painting a bit of shadow in the midst of a sunlit landscape. Before he has looked at the shadow five minutes, his eye will have completely recovered from the deadening glare of the sunlight, and will see every variety of light and shade, and will see every detail in the shadow, which it was quite unable to distinguish in looking at the general landscape. If the painter puts all this in, he will inevitably destroy the effect of his picture. 'But he sees it,' it may be said, 'why should he not paint it?' The answer is, that he does not see it until he has refreshed his eye by looking at that particular spot for some minutes, which is certainly not the way to take in the landscape as a whole. . . . To put the matter in a general form, the painter's tendency, as he paints each separate part, is to exaggerate the local difference of light and shade, and to over-accentuate the local details at the expense of the general effect; and this tendency is not caused by mere error of judgment, but is an actual consequence of the structure of the eye. He actually sees these things, and has to carefully learn not to paint them."

There is one portion only of Mr. Collier's book which we are disposed to criticise, that which includes his remarks in regard to ornament. On this subject he commits himself to two heresies; for such we regard them. One is, in maintaining the probability that all ornament, including such features as the Greek fret and its related forms, is probably derived in the first instance from the imitation of natural objects. This cannot be proved, and the philosophy of the matter is against it. A large quantity of geometrical ornament, we have no doubt, arises out of a love of regular repetition of lines and superficies, which is inherent in human nature, just as the love of rhythm or regular time, which is part of the basis of music, is inherent in our nature. There is the rhythm of the eye, in fact, as well as of the ear. Mr. Collier's other heresy is in declaring that there are no laws to which decoration must conform, except one, that it must be beautiful. The author seems to forget that ornament is to be considered in relation to the object it is applied to, and not merely *per se*, like a picture or a statue; and to say that there is no distinction of principle between good and bad ornament is really absurd. This is an additional illustration of what we have observed, that people who have very clear ideas about the higher forms of art do not understand ornament at all. Very few painters or sculptors know what ornament means. But this is a small portion of the book, and does not diminish materially the insight and good sense in regard to art displayed in it as a whole.

#### HERE AND THERE IN HEALTHY HASTINGS.

PERHAPS not one in a thousand of the summer or the winter visitors to Hastings and St. Leonard's ever penetrates the network of courts and undulating and winding byways that are located in the valley of the old Bourne river or stream, between the east and the west hills, or, more particularly speaking, dipping down to the Bourne walk between the elevated High-street and All Saints-street, running nearly parallel on either side. Extending over this elongated but comparatively narrow slip of ground, stretching nearly from the old coach or London road entrance to Hastings to the fish-market and the fishermen's beach (for there is really no regular harbour), lies what constitutes the old town. Compared with the modern town or fashionable Hastings, including St. Leonard's, which are now to all intents and purposes nearly one and indivisible, the older quarter looks but a very small segment. A closer acquaintance, however, with the old town will reveal much, and compressed within its circuit there is a thick matted volume

of varied life and living. It is through this part of Hastings that the most of the time at our disposal was spent, for the guide-books tell most of fashionable Hastings, and a few historic facts that all guide-books are expected to mention, but little about social life among the poor, and nothing at all about their habitations, and what is being done in this direction to improve their homes and belongings. We dived into many narrow courts and passages, up hill and down hollow, in the valley between High-street and All Saints street, and higher up east and round again by the East Cliff and along Rock-a-Nore-road, or among the fishing-boats and the fishermen. The narrow courts in the Bourne valley, or "Walk," have generally entrances and exits from either side; but the entrance from All Saints,—that is, the east side,—is so narrow that two people could not walk abreast. Many hundreds of poor families, some fishermen, others labourers, and more of a miscellaneous class of workers, live in this quarter of the old town. Many of them are very poor, and manage with much difficulty betimes to pay the rents of their very small dwellings. The cottages, if they may be designated as such, are, to a great extent, old and ill-constructed, and the rooms miserably small. The courts in sundry instances are so close to each other that the dwellings are back to back, and the diminutive yards in front supply the accommodation that is generally looked for in another direction. During wet or rainy weather, these courts and the surroundings of the dwellings present a very dreary picture. Some few of these courts expand to wider dimensions in their central parts, or at opposite ends, thus allowing, in some instances, a small patch of forecourt or railed-off garden space, but these are exceptional cases. Hereabouts, as well as in other parts of the old town, there are a number of weather-boarded dwellings or cottages, in which the walls are a combination of brick nogging, lath, and plaster, the outside boarding and the inside shell of plaster work hiding the hollowness (in every sense) of their rough construction. Even some of these cottages would seem to be designated with the title of "improved cottages," but thereby hangs a tale. In our walks through this old district of Hastings our eyes very often were attracted by four large letters thus, "H.C.I.S.," painted on the fronts of several old dwellings and cottages, and on others which appeared to have undergone some external renovation. We soon were enabled to solve the mystery of these big initial letters, for they spelt nothing more nor less than a local institution known as the Hastings Cottage Improvement Society. As soon as we solved the mystery, we more anxiously than ever began to look out for the improved cottages, but we cannot say that we were lucky in our quest. Perhaps we were too exacting, or our ideas of cottage improvement are regulated by a different standard than what obtains at Hastings Old Town.

In our second saunter along the Bourne Walk, and in the "All Saints" district, we found evidence of the work of sinners, and certainly the improvements could not have been carried out by saintly improvers. Closer inspection and inquiry showed us that the Hastings Cottage Improvement Society have bought up by degrees a considerable number of the old dwellings in the older quarters for the purpose of improving them, which it seems to have done,—at all events, on commercial principles. The improvements effected by the Society in many instances appeared to us to be of a very trivial kind, but according to the statements of a number of the poor tenants, the rents have been undoubtedly improved, if the dwellings have not. We do not wish it to be inferred that the Society has done nothing towards improving the old dwellings they bought up, but we do wish to say that several of these old improved dwellings ought to be improved out of sight by instant removal; and the same may be said of a large number of other old dwellings not belonging to the Society. They are structurally bad; have defective drains, and, from a sanitary point of view, they are a nuisance, and are not suited to the needs of the working poor, either in the accommodation they afford, or in the rents that have to be paid for them. Dwelling accommodation of another kind on the block plan has been provided elsewhere on the East Hill. Whatever else these dwellings are, they do not constitute cottage improvement. This dull grey-looking pile, in which brick is everywhere invisible externally, is named "Sorivent's Buildings." Its level is reached from the fishermen's

beach by narrow break-neck stone stairs, and its rear from All Saints-street by a steep incline. This barrack-like pile is constructed on somewhat similar principles to those of some of our so-called industrial dwellings. It is three stories high, and the dwellings have external stairs, and are entered from balconies or terraces supported one over another on metal columns. Here, too, the tenants complain of the rents being too high. Two rooms range from 3s. to 3s. 3d. or 3s. 6d., according to the fittings. Families who rent four rooms appear to have a separate w.c. accommodation, while two distinct families paying the lower rent have to divide one between them. A tenant with no copper, but desiring to have one, must pay an additional 3d. per week. The dust-bin provision, on the platforms or terraces, in sight of the doors and windows, and within a few feet of some of them, does not deserve commendation, either on the score of construction or position. There are other vexatious distinctions in connection with these dwellings, but we cannot enlarge upon them. These block dwellings in Hastings are not comfortable, any more than others elsewhere, and the tenants inhabiting them would not remain in them if cottages were procurable. The under-tenants complain of the noises overhead on the terraces above them. The beach is resorted to by several of the housewives for drying their linen, and it is certainly no small labour for them to descend from their eyries, perched high on the East Hill. The site, however, it is fair to say, is somewhat a healthy one, for the front of the building looks out to sea; but at the base there is another colony of poor people, or, rather, base and hill-side are peopled by a colony. Courts and by-streets with dwellings, for the working-classes are not to be found to any appreciable extent in the new town of Hastings. The modern fashionable district is reserved for public and private hotels and "genteel" boarding residences. The cry is still for more, and there seems to be no end to the ever-increasing and high-rented private lodgings for the visiting folk and invalids. The working classes are, for the most part, confined to the old town and its borders, and as some years must elapse before they can press westward or inland, on account of the fashionable bulwark that bars their way, the quarters of the old town will become more crowded, and the rents for the poor will continue high. House-building of late years has been pushed east a little, but the tide is westward and inland. The small number of houses built eastward have not been houses to suit the wants of the working classes, but of the middle classes. The slopes of the East Hill, or higher grounds, on a line with All Saints-street, have been invaded, and here terraces with houses mount one over another, broken by landings like flights of stairs. Right and left the poor are thus wedged into an elongated valley, between two high sand-hills, and the buyers-up, owners, and "improvers" of old tenement property in the immemorial bed of the covered Bourne stream are for the present masters of the situation. The tables can, however, be easily turned if there be any true public spirit in Hastings, and if the municipal or local authority is not too much interested in the tide of fashion and the prospective value of the rates, to pay some attention to the point-up stream of gasping, low life flooding the darksome valley and slopes of their old historic town.

Of local industries, there are scarcely any in Hastings, if we exclude the fishing trade. The constant expansion of the fashionable modern town, including St. Leonard's, and suburbs, extending a mile or two inland from the sea, provides to some extent employment for the building branches. The large building contractors often fall to the lot of London firms, but some local builders execute a fair share of the work about the town and suburbs. Within and without the Parliamentary borough estates have been mapped out for builders, and some of these estates are already dotted here and there with pretensions "villas," some standing in pairs, but detached, and others not much larger, though designated family mansions. Beyond the neatly-kept St. Andrew's Park (the first park of the town), and stretching inland across St. Helen's or Ore Down, and away by the new borough cemetery, the hills and valleys are to use estate agents' phraseology, "improving estates." For the time being, and from a speculative builder's or owner's point of view, this, to some extent, may be true, but we regret to add that the character of the houses (and we examined several of them), internally



and externally, constitutes no improvement. In these suburban erections there is a large amount of constructive deception in the brickwork, plasterwork, and woodwork, and in the general fittings and finishings. In some villas we found defective drainage, dampness, and dry-rot. We are making a nuground-d assertion, but are stating simple facts. Both on the skirts of the new town, in what may be called the immediate suburb, the Hastings speculative builder is fully equal to the low-class suburban London practitioner in the art of scamping and glossing over his drainage and building work. Outside the town, on the "improving estates," we examined some of the walls of the family resid-ences, which were represented to be built damp-proof,—built hollow for obtaining that end. The walls were, indeed, hollow, in the unsound sense of that term. They were not 14-in. work save in appearance, or built with an outer and inner course of brick, with a tie or bar between, but something like 9-in. work externally, with lath and plaster work internally, with a very good hollow space between the two surfaces. Tapping the plaster surface at first look, we soon discovered that a wall was loudly hollow by the sound it gave forth, and then the prod of a sharp penknife driven through the plaster up to the lath against the quivering laths which, told us what we suspected, and paved the way for farther examination, revealing considerable deception. But pass we along. Not very distant from the railway station we examined several new houses, some erected and others in course of erection, in which concrete to some extent was utilised in conjunction with bricks. We saw skeleton piers, bay-window interstices, flat arches or window lites formed of very coarse pebbly concrete, looking in some instances as if the work was run *in situ*, but altogether very rugged and irregular. This work was, to say the least, very shabby in appearance, but as the houses are altogether coated externally with cement, the irregularity of the work was soon covered over, and an air of finished solidity given to the whole. Thus, in Hastings a large amount of very rough bricklaying work, executed with very soft or inferior bricks, is hidden from view by that "save-all compo," which is made to cover a multitude of constructional sins. Good, sound, honest, naked brickwork frontages in or outside the town are few. The new town, nearly as a whole, is in varying terms a "stucco," "compo," cement, or plaster-faced town. The fashionable dwellings on the long parade facing the sea are nearly of one uniform white, or greyish white; but, though cement coated, many of them are substantially built and well finished within. But in streets stretching behind the parade, including St. Leonard's and inland, there is a large number of what may be termed second-class houses in construction, though pretentious enough externally, and these are much less substantially built. In these and the class below them the stucco or cement coating hides much defective brickwork. In another class of house, which we will term third-class, although their owners or occupiers would by no means admit them to be so, all the brickwork and other work, including the drainage, is positively scamped. Many of these are to be found on the borders of the new town, and extending into the suburbs. In connexion with these latter, the universal cement coating plays an important feature, and is made to act as a decoy. Settlements are common in this class of houses. We observed them in numbers in houses in course of erection, in the exposed brickwork, and in others just coated over. The nasty "settlement" is, however, not confined to what we have termed third-class houses, for we have found it in what are called the "superior residences" in the town, despite of annual puttying, plastering, and painting repairs. In a quarter of a century, more or less, many of these inferior houses are certain to be occupied by less fashionable tenants, and their sorrow will be too plainly stamped upon their faces to need a professional interpretation of the ills to which they will have encountered.

As we wish to be just in our notice, we are glad to state that, generally speaking, the public buildings in the new town are creditable specimens of architecture, and display good mason work. In some of the longer erected ones, particularly the churches, the stone has already begun to disintegrate, and there are instances where the effects are somewhat serious, and constitute at present positive disfigurements. Of new public buildings, the municipal offices

and police station are finished and occupied, off Queen's-road, and in this quarter a new theatre will be shortly provided. In the old town, near the top of High-street, a new R.C. Church is in course of erection. The style is Early Gothic, and the design is by Mr. Basil Champneys. The dressings are of freestone, and in the body of the masonry flints are utilised with considerable and pleasing effect. Towards the erection of this structure, Mr. Oventry Patmore, the poet, who resides in the town, has given the magnificent sum of 5,000*l.* The church is estimated to cost 12,000*l.*, and it is contemplated to build in connexion a tower to serve the purposes of a presbytery, at an additional cost of 3,000*l.* Near here, in the High-street, there are a few early eighteenth-century red brick houses, which, as far as external appearances and frontages are concerned, are in excellent preservation. Some exhibit ornamental work at the top and around the windows, and though the atmospheric wear and tear, wind and rain, have played upon these and the faces of the bricks are smooth and hard, and the good substantial old work is a pleasure to look upon. One of the houses bears some initials at the top, and the date 1721. In All Saints-street there are a number of very old houses of the cage-work or half-timbered kind, but evidencing renovation in their composite character at different periods. Some of these old structures show their rugged skeleton ribs in front of or flush with the materials and outer plaster coating. Titus Oates and Sir Cloudeley Shovel are two of the historic names associated with one or more of these old structures; the former is said to have lived in this street for some time, and the latter old admiral, who distinguished himself in English, Irish, and foreign waters, is believed to have been born in this street.

In respect to the general main drainage and water supply of Hastings, as a whole, as far as we had time to look into the matter, both appear to be fairly good. The water for drinking purposes is palatable, and we dare say in the fashionable dwellings and hotels it is filtered. The drainage of the town is by a system of intercepting sewers, with eastern and western outfalls, and penstock provisions, the discharge from each being regulated to take place at a certain point in the ebb of the tide. The carriage of the storm-waters is separately provided for. Looking east and west on the beach, in the vicinity of both outfalls, we did not perceive any ill effects, and if any sewage is carried back it is not so to any appreciable extent. We had not time to look minutely into the belongings of the drainage and outfall works. It would be unpardonable, however, if there was any failure in providing an efficient drainage or sewerage system for Hastings. The very configuration of the town, old and new, stretching inward from the seaside, with its series of valleys and slopes converging to the beach, facilitates a natural land drainage, and renders it a somewhat easy task to the engineer to provide main sewers and intersecting and subsidiary ones where necessary.

In the interests of the fishermen of the old town, a small fishing-pier and shelter harbour in front of the East Cliff are needed. The appliances here for beaching fishing vessels and boats are of the most primitive kind, and little appears to be done in the way of building and repairing boats or vessels of the larger kind. We did not discern any efficient boat-building yard, though we were told that upwards of fifty boats are employed in the trawling season, but whether all these hail from Hastings or otherwise we cannot say. The fishing-boats range from five to thirty tons burden, but the largest when fully equipped costs from 600*l.* to 800*l.* At times there is a good supply of fish in the market at Hastings, but in the summer season several of the fishermen find profitable employment in rowing the visitors in the offing in their small boats, and other of the men ply with sailing yachts. The sea-wall in front of the parade, particularly eastward, is constantly subject to strong tidal action, and even on comparatively mild days there are often heavy swells. In stormy weather the sea-wall eastward is often damaged, the waves rising several feet high and dashing over against the fronts of the houses. Lastly, in one instance, the door-steps of a fashionable lodging-house were carried away, and the door, windows, and forecourt much injured. Portions of the sea-wall have frequently sunk and given way, and at present there are portions sinking preparatory to

toppling. The parade, of course, west and east, is all made-up ground won from the sea. In the new town, extending along in front of the ornamental pier, the footway and roadway combined are so wide, and the dwellings are so far removed from the sea-wall, that the waves in the most stormy weather can do little harm, save occasionally driving the promenaders close to the beach a little more inland if they wish to avoid a possible drench. Towards the East Cliff and fishermen's quarter a better system of groyning and embanking is needed than any yet tried. We witnessed some slight efforts during our visit by way of repair, but the work is not suited for the position. The sea accumulates shingle to help embanking and protecting the sea-wall at Hastings, but it often carries it back again. Better footings in embanking, as in groynework, are needed. The construction of what is to constitute the protection needs to be studied as well as the object to be protected. A groyne, in a word, needs to be protected as well as a sea-wall, or so fixed that it will be able to protect itself as well as afford protection. If the Hastings authorities read construction in this light they will not embark in vain in future.

Although we have not exhausted our notes, we must for the present bring them to a close, and can only add a few words more. Hastings, including St. Leonard's, is without doubt a healthy and fashionable seaside resort and its air is well suited for invalids of a certain kind. We wish to see the town improve as it advances in area and population. The Municipal or Urban Sanitary Authority ought, however, to pay a little more attention to the wants of the old town and its inhabitants. There is a field here for their improving efforts, and a field that should not be overlooked. The local authority should also look closer into the system that obtains in the erection and drainage of a certain class of houses we have indicated within and without the town. Since the late Mr. De-mous Barton, the architect, pioneered the way at St. Leonard's, Hastings, as a health resort, has made a marvellous progress in area and population. Little more than half a century ago Hastings was but a speck compared with its present dimensions, and St. Leonard's a germ. It bids fair now to rival Brighton, and beats it in some points as a health resort. The premier old Cinque Port is amazed at itself, and what it may be, in the blaze of its fashionable life. Fashion, however, is somewhat fickle, and not unlike shifting sands, and it behoves the local authority to sow as well as reap in view of the future. Provide by all means for the flood of fashion, but its possible ebb should not be overlooked. It would be a serious oversight to ignore the ever-increasing wants of the stationary and working population. It would be a wise foresight to develop and foster a few local industries as a resource to fall back upon in adverse days.

#### DE NEUVILLE'S "ST. PRIVAT"

THE latest of the distinguished French battle-painter's works is now on view at Messrs. Dowdeswell's, 133, New Bond-street. It represents the close of the desperate struggle between the French and a much larger force of the Germans at the village of St. Privat during the Franco-German war. After Marshal Canrobert had decided on the necessity of retreating with the main body of the army, a battalion of chasseurs and three regiments of the line were left to hold the place till the last moment, and cover the retreat of the main army. This small force behaved with an obstinate gallantry which may well make M. de Neuville proud to record their achievement in painting, though he has not yielded to the patriotic temptation of representing the German personalities in so unfavourable a manner as in the companion picture, "Le Bourget." The moment chosen by the painter is the last stand made by the French in the churchyard in the centre of the village, where the Prussians finally overpowered the French survivors. The angle of the church is seen on the left, the churchyard strewn with dead and wounded lying almost in heaps on one another; the German party have just broken in the large gate of the churchyard, having apparently found getting over the low wall a proceeding too expensive of lives; they are thronging in pell-mell, while another helmeted party appear coming round the angle of the church from the left. Three or four of the French officers, some wounded, stand quietly with their backs to the church wall, having apparently come to the



conclusion that all is over, and that honourable surrender is what remains. Beyond is seen the open square, strewn with prostrate forms, and the lines of the Germans thronging in; two German officers stand at the door of the principal house watching with great sangfroid the proceedings at the churchyard, while their men are firing from the houses they have entered. The town was fired before the retreat, and the blazing houses down the street form the background to the whole. Over the old stone gateway of the churchyard the stone cross rises from the broken Renaissance pediment, standing out as if in ironical mockery of the scene beneath. One of the cleverest and most telling figures is that of a Frenchman just shot, falling back towards the spectator with outstretched arms. It is a grimly earnest and, let us add, a very painful picture; and, with all our admiration for M. de Neuville's splendid talent, we are disposed to wish that it may be the last of its class. Enough has been done for glory, and enough for reading the moral on war, without further perpetuating scenes which one may hope will become less and less frequent,—not that we think fighting the worst thing that is done in the world, nor even doubt that there is a species of wild joy in the conflict for the moment, both for victors and vanquished: *mais après?*

#### GIRTIN'S DRAWINGS AT THE BRITISH MUSEUM.

THE collection of drawings by Girtin, which has been recently acquired by the British Museum, is now exhibited on screens in the King's Library, and is well worth a visit. On one occasion, when a large collection of his works was made by the Burlington Fine Arts Club three or four years ago, we went at some length into the characteristics of Girtin as a landscape-painter and water-colour artist of the early school. His drawings afford a remarkable example of the power of relative force and gradation of tone, in such able hands, to supply many deficiencies of a very limited palette. He habitually painted on toned paper, often of a very rough description, but from this brown or grey ground, with his few colours, he obtained remarkable landscape effects, which, though far below the scale of colour in nature, appear complete in themselves, and even deceive the eye into the belief in a much higher scale of colour than is actually employed. Girtin's style is of the broadest, and he is capable of no little grandeur when the subject and scale allow of it, as is shown in one or two of the larger drawings in the King's Library. The greater number of the works there are on a small scale, some of them very slight in execution, but all showing the hand of a master in landscape composition; and some of them have a separate topographical interest, representing views of parts of old London, so that they are not inappropriately placed in the same room with the selections from Mr. Crace's London collection. The highest interest of the Girtin drawings, however, is in the example they give of the early school of English water-colour painting in the hands of the ablest exponent of it before Turner; and as Girtin's drawings are not very often to be seen in a collective form, the opportunity should not be lost while those we have referred to are on view, as they probably will be for some time.

**Stoppage of the Channel Tunnel.**—In reply to an inquiry in the House of Commons by Sir G. Campbell, Mr. Chamberlain said the Government have come to the conclusion that it is desirable that what is called the experimental boring of the Channel Tunnel should be stopped, and that further expenses should as far as possible be avoided until Parliament has come to a decision whether the Channel Tunnel is to be made or not. We need scarcely say we are very glad to hear it. We gave our reasons for objecting to the scheme when no signs of dissent had been heard elsewhere.

**The Floating Commercial Exhibition.**—The Floating Commercial Exhibition, promoted by Messrs. Fry & Co., 17, Fenchurch-street, has taken shape. The exhibition will be fitted up on board the *Viceroy*, and will probably sail in June. We are glad to hear that Mr. Frederick Sage, of Gray's-inn-road, has been appointed case-maker to the Exhibition, and for the convenience of exhibitors he has prepared a sheet of drawings showing what can be done at various prices.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

OFFICERS AND COUNCIL, 1882-83.

THE annual general meeting of this Institute was held on Monday evening last, Mr. Henry Curry (Member of Council), in the chair.

The report of the Council on the state of the property and affairs of the Institute having been taken as read, Mr. J. T. Knowles, Member of Council, moved, and Mr. Charles Barry, F.S.A., Past President, seconded, that "the report be received and adopted." This, after a few inquiries and some discussion, was put and carried *unanimously*.

The following Fellows were elected to the offices of President, Vice-Presidents, Secretaries, and other Members of Council, for the year terminating on the first Monday in May, 1883, namely:—

**President.**—Horace Jones.  
**Vice-Presidents.**—Ewan Christian; David Brandon, F.S.A.; Edward P'Anson, F.G.S.  
**Ordinary Members of Council.**—Arthur William Blomfield, M.A.; James Brooks; Arthur Cates; Joseph Clarke, F.S.A., Past Vice-President; Henry Curry, Past Vice-President; John Gibson, Past Vice-President; Octavius Hansard; John Honeyman, Glasgow; James Thomas Knowles; Edward Graham Paley, Lancaster; Sir James Allanson Pictou, F.S.A., Liverpool; Professor Thomas Roger Smith; George Valliamy, Past Vice-President; Alfred Waterhouse, A.R.A., Past Vice-President; Thomas Worthington, Manchester.

**Honorary Secretary.**—John Macvicar Anderson.

**Secretary.**—William Henry White.  
The following gentlemen were elected to the offices of Treasurer, Honorary Solicitor, and Auditors, for the year terminating on the first Monday in May, 1883:—

**Treasurer.**—Sir Walter Rockliffe Farguhar, bart., Hon. Associate.  
**Solicitor.**—Frederick Willis Farrer.

**Auditors.**—James Ebenezer Saunders, F.S.A., F.G.S., Fellow; Lewis Solomon, Associate.

A vote of thanks to the scrutineers for the annual election was passed by acclamation. A vote of thanks to the auditors for the past official year, proposed by Mr. Ewan Christian, Vice-President, and seconded by Mr. J. T. Knowles, Member of Council, was passed by acclamation, and briefly acknowledged by Mr. Wyatt Papworth, Fellow.

The scrutineers, appointed by the meeting to receive the balloting papers and report the result were Mr. Wyatt Papworth, Fellow, and Mr. C. Forster Hayward, F.S.A., Fellow.

#### Examiners under the Metropolitan Building Act, 1855.

The following gentlemen were elected to serve on the Board of Examiners (appointed under the Metropolitan Building Act, 18 & 19 Vict. c. 122, a. xxxiii.), for the year of office 1882-83:—

George Aitchison, A.R.A., Fellow; Thomas Blashill, Fellow; Francis Chambers, Fellow; Charles Fowler, Fellow; Edward P'Anson, F.G.S., Vice-President; Joseph Jennings, Fellow; Professor Robert Kerr, Fellow; James Thomas Knowles, Member of Council; Joseph Douglas Mathews, Fellow; Frederick William Porter, Fellow; Professor Thomas Roger Smith, Member of Council; Sancton Wood, Fellow.

The proceedings having been thus brought to a close, the meeting adjourned.

#### LONDON THEATRES.

In the list of the numerous duties proposed by Mr. Firth (in his essay on "London Government and How to Reform It," recently published by the Cobden Club) to be imposed upon the Central Municipal Council or Corporation to be established in London, there is one duty which he appears to have overlooked, and that is the supervision of theatres and other places of public amusement. The system by which those institutions are regulated is so antiquated in character, the authorities exercising jurisdiction are so numerous, and the enactments affecting the subject are so scattered and uncertain, that nothing short of the placing of the entire control in the hands of some powerful independent body endowed with the requisite power to enforce its requirements in case of need will respond to the clearly-expressed conviction of the public.

There has been of late a disposition to saddle somebody with the blame for having permitted the present unsatisfactory condition of our London theatres to have continued for so long a time. The most popular scapegoat is the Lord Chamberlain, who is supposed to possess unlimited powers of control; next to him comes the Home Secretary; and, lastly, public attention has been centred upon the Metropolitan Board of Works, who, we have been recently informed by Sir William Harcourt, are amply empowered to protect the public and to insist upon any alteration which may be required for the safety of persons frequenting these places of amusement.

In vindication of the Lord Chamberlain, it must be borne in mind that his authority over theatres is one of considerable antiquity, and that it was not originally intended to provide for the security of the public, but was instituted for an entirely different purpose, namely, the prevention of the production of plays of a disloyal, immoral, or rebellious character. Of late years more attention has been paid to the structures of the theatres themselves, and regulations have been made with a view to secure the safety and convenience of the audience; but the control of these matters really forms no part of the Lord Chamberlain's duty. This latter function has been assumed by him without legislative sanction or control, and has been certainly exercised with advantage to the public.

The staff at the disposal of the Lord Chamberlain is, however, quite inadequate for the proper inspection and regulation of the many theatres in London. It is an open secret that the whole duty of the Lord Chamberlain's department, so far as relates to the construction and management of theatres, devolves upon one gentleman, assisted occasionally by the advice of an architect,—who is not, however a permanent official, but is called in when occasion requires, and is paid, so to speak, by the job. This arrangement was fairly satisfactory in past times, but the rapid increase in the number of theatres in the metropolis of late years, and their greater complexity of structure, both before and behind the curtain, as compared with the older theatres, have far outstripped the moderate means devised for their regulation. From time to time the Lord Chamberlain has issued instructions to the managers of theatres, suggesting certain precautions for the protection of the public; and recently he has insisted upon alterations of a structural character before renewing the licence to some of the London houses. It is obvious that in a country like England a Court official, who is not elected by popular suffrage, and is not responsible to Parliament, must feel a natural reluctance to exercise the powers with which he is entrusted in such a manner as to cause ruin to managers and wide-spread distress among the persons employed in theatres, by insisting upon wholesale and radical alterations, such as are not called for by the public. There are several theatres in London which are admitted to be dangerous; but these have been licensed year after year without complaint, and it would appear an arbitrary act to call upon the lessees to close those theatres, or practically to rebuild them, in consequence of a panic.

This is evidently the explanation of the apparent apathy of the Lord Chamberlain with regard to the London theatres. On his accession to office he found that many of these buildings were in an unsatisfactory condition, but he shrunk from the responsibility of closing them altogether, and contented himself with effecting such improvements in them as he found were practicable from time to time. This may not, perhaps, be a strictly logical way of dealing with the question, but it is one that commends itself to the English mind as being of the nature of compromise, which has been deemed to be the perfection of government, and resembles the method that has been adopted with regard to most municipal matters.

We are sometimes told that the theatres abroad are better regulated than our own, but this is not the case, as may be seen from the action recently taken by the Prefect of the Seine with regard to certain theatres which were almost entirely constructed of wood. The Prefect was desirous of closing these theatres, but finding that he had no power to insist upon this being done, he had recourse to the ingenious device of condemning the structures as dangerous, and stationing police officers at the entrances, to prevent the admission of the public. This incident will show that in spite of the wholesale demolitions that have been going on in the



French capital, and the elaborate regulations in force as regards theatres, Paris is positively as badly off as London, and it is extremely probable that the chief towns of other Continental countries will be found to be in no better condition.

The jurisdiction of the Metropolitan Board of Works over theatres is of a limited character, and was conferred upon the Board by a comparatively recent enactment, the Metropolitan Management and Building Acts Amendment Act, 1873, one of the short Acts for the improvement of the municipal law which, since the failure of their proposed new Building Act in 1874, the Board has preferred to pass in preference to a larger measure.

By clause 11 of this Act it is provided that whenever it shall appear to the Board that any theatre or other place of public entertainment containing a superficial area for the accommodation of the public of not less than 500 square feet, is so defective in its structure that special danger from fire may result to the public, the Board may, having first obtained the consent of the Lord Chamberlain as regards theatres under its jurisdiction, and of the Home Secretary as regards music-halls, require such structural defects to be remedied, provided they can be remedied at a moderate expenditure.

It will be seen that the power of the Board is strictly limited, and cannot be exercised without first obtaining the authority of two important officials, who have it in their power to stop proceedings from their beginning apparently without assigning any reason. We are not aware of the extent to which the Board have availed themselves of the powers conferred upon them, or whether any difficulty has been experienced in obtaining the necessary consent required by the Act, but it appears that the necessity of obtaining a preliminary authority, before any action can be taken under the Act, is likely to create difficulty and to cause delay. It is probable that at the present time, looking to the excited condition of the public mind, the Board will not meet with any opposition from the officials referred to, but under ordinary circumstances the allowance of the Board's request to require alterations would seem like an admission that the Lord Chamberlain and the licensing magistrates had not done their duty. With the exception of the two patent theatres, the whole of the play-houses and music-halls are licensed annually. It may be assumed that some report as to the safety of the buildings, as well as of the manner in which they are conducted, is required by the licensing authority, who may not have the power to insist upon alterations, but who certainly have the power to refuse the licence. The public will naturally ask why this power has not been exercised, and there will certainly be reflections upon the authorities if it is found, as it seems to have already been the case, that several of our places of amusement are in a condition that is fraught with danger to the public frequenting them.

The next difficulty is that the defects must be such as can be remedied at "a moderate expenditure," a definition which is open to various interpretations. Upon this head it may safely be remarked that the entire re-building of a theatre or music-hall could not be assumed to be a "moderate expenditure," and the Act would not, therefore, meet the case of a building (of which there must be examples), that is so radically defective as to be incapable of any improvement.

The question of what is a moderate expenditure, and all other questions under the Act, are to be determined in the case of dispute by an arbitrator to be appointed by the First Commissioner of Works, who is endowed with plenary powers under the Act.

The Board is further empowered to make, alter, vary, or amend, such regulations as they may think expedient for the protection of theatres, and other places of amusement which may be built after the passing of the Act, from fire. The Board has already framed a series of regulations, but as they were drawn up some two years ago, before public attention had been pointedly drawn to the construction of theatres, it is a question whether it would not be desirable to revise the regulations with a view to increasing their stringency. These regulations will play an important part in any action taken by the Board, and it will be certainly desirable they should be made as complete as possible, inasmuch as it will be difficult for the Board to insist upon

alterations or additions to old theatres which could not be required by the regulations in the case of new theatres.

The Home Secretary has publicly expressed his opinion that the law as it at present stands is sufficient to secure the safety of the public frequenting places of amusement, and has declined to entertain a proposal to inquire into the general question of the legislation affecting theatres, &c., until he is convinced that the Metropolitan Board's powers are ineffectual to protect the public. There may be difficulties in the way of devising a complete reform of the present anomalous condition of affairs, but the moment appears to be opportune to abolish the present divided jurisdiction affecting theatres, and of concentrating the powers already possessed by the Lord Chamberlain, the Middlesex and Surrey Magistrates, and the Metropolitan Board of Works, in the hands of a single department. There would probably be no objection to placing this responsibility upon the Metropolitan Board of Works, who have been already entrusted with the more onerous portion of the duty. It is obvious, however, that to efficiently superintend the construction and regulate the management of the 500 places of amusement existing in London will necessitate the organisation of a larger staff than is at present at the disposal of the Board. The Board has recently taken upon itself the care of the Metropolitan bridges and commons, and there is no reason to doubt that it would be equal to the emergency of looking after London theatres and music-halls until the time arrives for the constitution of the new governing body for the whole of the metropolis.

Mr. Firth, in his essay on the Government of London, already referred to, remarks (pp. 44-45), "It has often been contended by opponents of a unified system of London government that a central authority would be unable to deal effectually with the details of municipal government, and that local interests would thus be neglected. The jurisdiction now exercised by the Metropolitan Board over buildings in the metropolis is an illustration of the possibility of the closest details of municipal government being directed from a single centre." The Board now exercises partial control over all public buildings erected, and it would seem only a necessary corollary to give them complete jurisdiction over public buildings of whatever kind, including churches and chapels, which are, to a certain extent, as much in want of regulation, as regards the safety of the public frequenting them, as theatres and music-halls.

#### ON SOME RECENT DECISIONS IN RELATION TO BUILDING AGREEMENTS.\*

In further continuing our remarks on some recent decisions in relation to building agreements, we may, without preface, proceed to notice the decision in the case of *Maraden v. Sambell*, 43 *Law Times Reports* (N.S.), 120; 23 *Weekly Reporter*, 982. In this case there was a building agreement pretty much in the usual form of these documents, and one of the stipulations was, that the builder should complete the houses by a certain date, namely, the 24th of June. Then there was a covenant that the builder should not, without the written leave of the landowner, remove any building materials off the land after they had been deposited there, and also a proviso which, as the judge characterized it, "though drawn with great inexactitude," amounted to a proviso for re-entry by the landowner on breach by the builder of the covenants of the agreement. Of course, this is a very usual stipulation, and, we will hope, is usually clearly expressed; but, whether obscurely or comprehensively drawn, it is found in most building agreements. But the effect of such a stipulation as this is legally without doubt; for, on a breach of one of the covenants, the landowner may affirm or may rescind the contract. The right, however, is subject to certain qualifications, which are, that he may not rescind it if the position of the parties has been so changed by any act of the landowner since the breach that the former position of things cannot be restored, or if the rights of third parties have intervened; and further, and this seems only to be, in another form, the same rule, the intention of the landowner to exercise his election by rescinding the contract must be clearly shown. We say this latter qualification

is the first rule in other words, because it is obvious that, if the landowner has not signified his election in a clear and certain manner, and the builder has, consequently, fallen into the belief that the contract is not rescinded, and goes on with it, and enters into fresh sub-contracts for, we will say, the purchase of materials, then that the conduct of the landowner has, since the breach of covenant, caused the position of the parties to be changed. Again, Mr. Pollock, in his able work on the law of contracts, states another qualification, viz., that the contract must be rescinded within a reasonable time, that is, before the lapse of a time so long after the true state of things (or the breach) is known that, under the circumstances of the particular case, the other party may fairly infer that the right of rescission is waived. Now, again, this appears to be, more or less, the primary rule, or rather qualification, in another form, because if the landowner has waited so long after the breach that the builder might reasonably suppose that the contract was not considered at an end by the landowner, and acts accordingly, thus again, the act of one of the parties, namely, of the landowner, has changed very materially the position of the parties since the breach.

In the case to which we are more immediately referring, there was a breach of the covenant to complete the houses by the 24th of June, and these legal principles were more or less touched on in other words by Mr. Justice Fry. But the importance of the case to readers of this journal is not so much the enunciation of certain legal principles, upon which we consider there is not much doubt, but in their application to a purely building case, and because the decision shows clearly how they may practically affect both landowners and builders in similar, and probably many similar, circumstances. The main facts of the case were these,—failure by the builder to complete on June 24th; on the 27th an advance of 15*l.* to the builder by the landowner; on the 6th of July the landowner, by telegram, instructs one Pratt, who was employed on some adjoining property, to keep an eye on the premises, and not let any materials be removed from it, and accordingly he "hangs about" the premises. Meanwhile, drain-pipes are being laid down by the builder; no one interferes with him, and no communication is made to him. On the 25th of July the work comes to an end, in consequence of a claim by the landowner, at an interview with the builder on the 15th of July, that by reason of the non-completion of the premises on June 24th they were forfeited to him from that date. Therefore, the question arose whether it was an unreasonably long period for the right of election to be in abeyance, viz., from June 24th to July 15th, and whether,—which, as we say, is the same thing,—the conduct of the landowner had been such as, since the date of the breach, to alter the position of the parties so as to prevent him from exercising the election which was clearly in his power on the 24th of June to rescind the contract. Let us, then, see how the Judge applied the principles to the facts. "In order," he said, "to determine the point, it is necessary to consider the relation of the parties under the contract. The defendant (the builder) was to go on working with all reasonable despatch, and, in all probability, until stopped, he would go on working, and, at all events, doing something on the land. I think that a period of three weeks is more than it was reasonable to elapse before exercising the right of re-entry. On the other hand, suppose that the true view is that the right is a right to elect at any time, unless the rights of third parties have intervened, or the other party to the contract has altered his position under the belief that the contract was a subsisting one; then, taking the case in this way, I think that the result is the same, because, within the three weeks which had been allowed to elapse, the builder had altered his position, and with the impression that the contract was still subsisting. He had laid out money on drainage pipes and other matters, and I think, therefore, that in either way of looking at the case, the landowner had lost his right to rescind on the 15th of July." This seems to be a judgment which is distinctly instructive both to builders and landowners, for it gives a measure of their respective rights. The principle, as all reasonable principles are, is plain and clear, but it is in the application of the principle that difficulties so frequently arise. But, at the same time, it must not be supposed that three weeks would always be too long a period, because

\* See p. 432, ante.



suppose work going on in winter and non completion by, we will say, January the 3rd, and then that a day or two after all operations are stopped by a severe frost, which prevented any work for three weeks, and that a day or two after the end of that period the landowner signified his election. It might very fairly be urged on his behalf that as during the three weeks no work could be done, that this time should not be considered, under the circumstances, as too long. On the other hand, it is equally clear that if the landowner desires to be on the safe side he should signify his intention to rescind the contract in plain and unmistakable terms within a few days of the breach, and before the builder has, so to say, done anything important in the way of changing his position.

The next case is also one which is concerned with the question of completion, but arose out of an ordinary contract to do certain engineering work. It is, however, an Irish case, namely, *Mohau v. The Dundalk, Newry, and Greenore Railway Company*, 6 Irish Law Reports, 477, and, if good law, is an extension of the principle laid down by *Walker v. The London and North-Western Railway Company* (Rasco's "Digest of Building Cases" p. 42), which decided that the clause putting an end to the work for unreasonable delay must be enforced before the date fixed for the completion. But in the Irish case there was a non-completion by a specified time, then a mutual agreement to extend the time for a reasonable period, and then, during what must be taken to be within a reasonable period for completion of the works, they were taken out of the hands of the contractors because there was a delay in proceeding with them, and because they were not progressing to the satisfaction of the landowner's agent. The Court decided that it was not competent for the Company to exercise their power of taking the work away from the contractors simply on the ground of delay. But the criticism which must be made on this judgment is, that if delay during the progress of the work before the date originally fixed for completion entitles a landowner or a company to take the work away from the contractor, why should not such a stipulation equally apply if the time is extended? Otherwise the extension of time by the employer simply means a licence to the contractor to proceed at such pace with the work as may suit his fancy or convenience. For there was a stipulation in the contract that if the contractor should delay in the progress of the work, then that the company should be entitled to take them from the hands of the contractors, and if there was delay, why should the clause not apply to the question of reasonable time? In *Walker v. The London and North-Western Railway* there was no mention made of a delay at all, and therefore the judgment in that case may be distinguished. However, we have pointed out the decision to our readers, and though it is not a judgment of an English court, it cannot be passed by without notice.

#### "WELCOMBE," NEAR STRATFORD-ON-AVON.

This mansion was built for the late Mr. Mark Philips, formerly M.P. for Manchester, and is owned now by Mr. R. N. Philips, M.P. for Bury.

The whole of the works were carried out under the direction of Mr. Thomas Newby, architect, 2, Victoria-street, Manchester. The obelisk on the hill is built of stone, and was erected to the memory of the late Mr. Philips.

The view and plan sufficiently explain the arrangement of the mansion.

**Lectern, St. Margaret's Church, Bodelwyddan.**—A carved oak lectern, executed by Mr. T. H. Kendall, of Warwick, has been placed in St. Margaret's Church, Bodelwyddan, near Rhyl, in memory of the late Sir Hugh Williams. The design of the lectern is very striking. An eagle is represented in the act of rising from a piece of projecting rock, with the wings spread and the head turned half-way round. The figures in the rock, and the ferns and other wild flowers, are delicately carved. Around the base upon which the rock stands is inscribed, both in English and Welsh, "To the Glory of God, and in Memory of Sir Hugh Williams, 3rd Bart., of Bodelwyddan, by his Children. May 10th, 1876."

#### THE TOMB OF MR. AND LADY MILDRED BERESFORD-HOPE, KILNDOWN CHURCH, KENT.

We present, to-day, the monument which is to mark the burial-place of Lady Mildred (prospectively) of her husband, Mr. Beresford-Hope, in the churchyard of the parish where their seat, Budgebury, stands. In working out the idea, Mr. Beresford-Hope desired to make it, not only a memorial, but also an addition to the iconography of Kilndown Church. At present, in the east window the infancy of Our Lord is represented, and in the recesses the Crucifixion, while in this structure the Saviour appears in Majesty as Judge, with a particular reference to its being a portion of a tomb.

It will be seen that the principal feature of the design is an adaptation of the familiar idea of a headstone, but on a scale suitable to its standing at the head of two coupled tombs, and further developed so as to fulfil the function of a churchyard cross.

Our Lord's figure is seated within a vase as the *Res tremenda majestatis*, with the Imperial crown and orb; on either side are the angels blowing the judgment trumpet;—

"Tuba mirum spargens sonum,  
Per sepulchra regionum,  
Cogit omnes ante thronum."

In the panels below, as symbolical of the actual relations of the seen and unseen worlds, are the archangels: St. Michael, in the centre, as the general guardian of the church. At the head of Lady Mildred's tomb is St. Gabriel, as the bearer of the message which exalted womanhood; and St. Raphael, at the head of the prospective tomb of Mr. Beresford-Hope, the protector of the pilgrimage of life, as expressed in the old hymn,—

"Angelus nostrum medicus salutis  
Adsit e coelo Raphael ut omnes  
Sanet aegrotos, dubiosque vites,  
Dirigat actus."

The memorial faces westwards towards the high-gate, so as to be seen by all entering the churchyard.

The structure is of various kinds of granite, overlaid with bronze work; the figures are of white metal work on a ground of coloured enamel. The granites used are Peterhead, on plinths of Inverness dark grey. The tombs are of Shap and Peterhead granites.

The bronze work is all modelled and cast separately, and fixed to the granite, which will show as a ground to the traceries in the front; and at the back will be fully exposed and covered with a conventional rose-pattern diaper; Lady Mildred's portrait being introduced in a medallion in the centre.

The projecting buttresses and the cross are entirely of bronze. In the centre of the cross is an enamel picture of the head of our Lord, from a Murillo belonging to Mr. Beresford-Hope.

The bronze and enamel work are being executed by Messrs. Singer & Son, of Frome, and the rest of the work, including the modelling, is by Mr. Forsyth, of London.

The cartoons for the figures are by Mr. J. R. Clayton; and the design of the whole is by Mr. R. Herbert Carpenter and Mr. B. Ingelow.

The adjoining tombs are of various members of the family, the larger coped tomb being that of the late Lord Decies and the smaller cruciform coped tomb is that of one of Mr. and Lady Mildred Beresford-Hope's daughters; eastward of this, but hidden by the projecting angle of the church, is the lofty canopied tomb of Marshal and Lady Beresford by the late Mr. Carpenter.

#### HYDE PARK CORNER AND HAMILTON-PLACE IMPROVEMENT SCHEME.

The number of schemes we have received afford proof that the plan proposed by the First Commissioner of Works for the relief of the traffic at Hyde Park Corner, and for which the Board of Works so hastily and inconsiderately voted money, is not generally approved. Some of them are obviously founded on the plan by Mr. Statham, published by us (p. 486 *ante*), and as it seems to us are not improvements upon it. We publish this week a sketch showing a method of dealing with the congested traffic both at Hyde Park-corner and Hamilton-place. This is altogether different from anything that has hitherto come before us. The drawings have been executed by Mr. W. H. Collbran, of

South Kensington. By taking the levels and measurements according to the Ordnance Survey, Dr. Churchill conceived the idea of dividing the two lines of traffic without in any way interfering with private property or disturbing existing structures. It is proposed to carry the principal line of traffic, viz. that along Piccadilly, by a short diagonal subway under the crown of the hill at Hyde Park-corner. The approach to the subway would commence opposite the Alexandra Hotel, and the park railings would be set back a few feet so as to allow of a width of road sufficient for the east and west traffic.

To form this subway it is proposed to excavate a nearly square block of earth bounded by the Wellington Arch on the south, and the entrance to the park on the north; the two adjacent "refuges" form the east and west boundaries. The general traffic from Knightsbridge would be carried under a girder span. If additional light is required it can be provided by openings at the sides marked "A" on the plan.

The gradient of the new road would be reduced from 1 in 40 (the existing road) to 1 in 70.

It is urged that a great saving of horseflesh would be effected with such a gradient, especially in the heavy traffic, for the new road would be nearly level.

The exit of the subway would be just within the railings of the Green Park opposite Apsley House. The road continuing the same gradient would gradually rise to the lowest level of Piccadilly, opposite Brick-street.

A special advantage of the scheme would be that no public monuments would be interfered with, and the ancient right of way from Buckingham Palace to Hyde Park by a short and direct transit across Piccadilly would be preserved intact. The continuous flow of the traffic without any hindrance or delay is the great object to be sought after for the comfort and convenience of the public. One special feature of this plan is that the block at Hamilton-place should be dealt with at the same time as that at Hyde Park-corner.

Dr. Churchill, adopting the expression made use of by the First Commissioner of Works, remarks that "the only way to cure or even relieve, 'congestion of traffic' must be founded upon the same principles as those adopted for the cure of local congestions in *corpore hominis*, viz. to constrict the abnormally dilated arteries rather than unduly expand them. Whenever the avenues to a thoroughfare are abnormally dilated, collisions are very likely to occur in consequence of the traffic being 'all over the field.' In order to collect the dispersed traffic as it would focus at Hamilton-place, according to the scheme proposed by Mr. Shaw-Lefevre, extra policemen would be required, which would greatly increase the burdens of the rates.

Dr. Churchill and his technical advisers agree with our previous correspondent that the block of traffic is more felt at Hamilton-place than at Hyde Park-corner, on account of the heavy gradient existing there, which causes a severe strain upon the horses coming down Hamilton-place when suddenly checked by the cross traffic.

It is generally admitted, as our previous correspondent remarked, that "nothing would really clear away the obstruction at Hamilton-place but a roadway carrying away the traffic *under* Piccadilly." Dr. Churchill takes advantage of a nearly equal rise and fall of the Piccadilly roadway contrasted with the persistent heavy fall of the gradient from Hamilton-place to Halkin-street, and argues that his plan is therefore the most natural and effectual way of obviating the congestion.

By splitting up the two lines of traffic and keeping them absolutely and for ever distinct, he considers he has solved the difficulty.

Some slight modifications of this scheme have been proposed to Dr. Churchill. One friend advises that the subway should be longer, i.e. less diagonal; and another suggests the shortening of the proposed road in the Green Park; but the plans which we publish to-day, and which have been submitted to the Queen with her Majesty's consent, are those which Dr. Churchill has formulated and adopted.

**Leicester.**—At a meeting of the Highway and Sewerage Committee of the Corporation of Leicester, on Friday, the 21st of April, Mr. F. W. Allen, of West Bromwich, was appointed chief building inspector for the borough. There were 234 applicants for the appointment.







OLD CUSTOM-HOUSE AT KITZINGEN.

## OLD CUSTOM-HOUSE AT KITZINGEN.

THE great Custom-house or bonding warehouse at Kitzingen is supposed to be a work of Bishop Julius, as it has his arms upon it, and is quite in the usual style which he adopted in all his buildings. Julius was a liberal and magnificent prelate, and everything which he did was done well and thoroughly. The Grand Hospital and University which he founded in his episcopal city are amongst the noblest institutions in Europe. Architects had a lively time of it under this illustrious Prince-Bishop, who is said to have erected over 300 churches, to say nothing of secular buildings. All the buildings carried out during his reign are remarkably ornamental, well constructed, and have a very marked character about them.

The treatment of the staircase-turret and the gable of the Custom-house at Kitzingen deserve attention from their originality. The window-heads, formed of inverted segments of circles, are not uncommon in Germany, though very rarely to be seen in this country. Examples, however, are to be found here and there in England. The windows and doorways of some

of the old stone houses in Lancashire, for example, exhibit the same form.

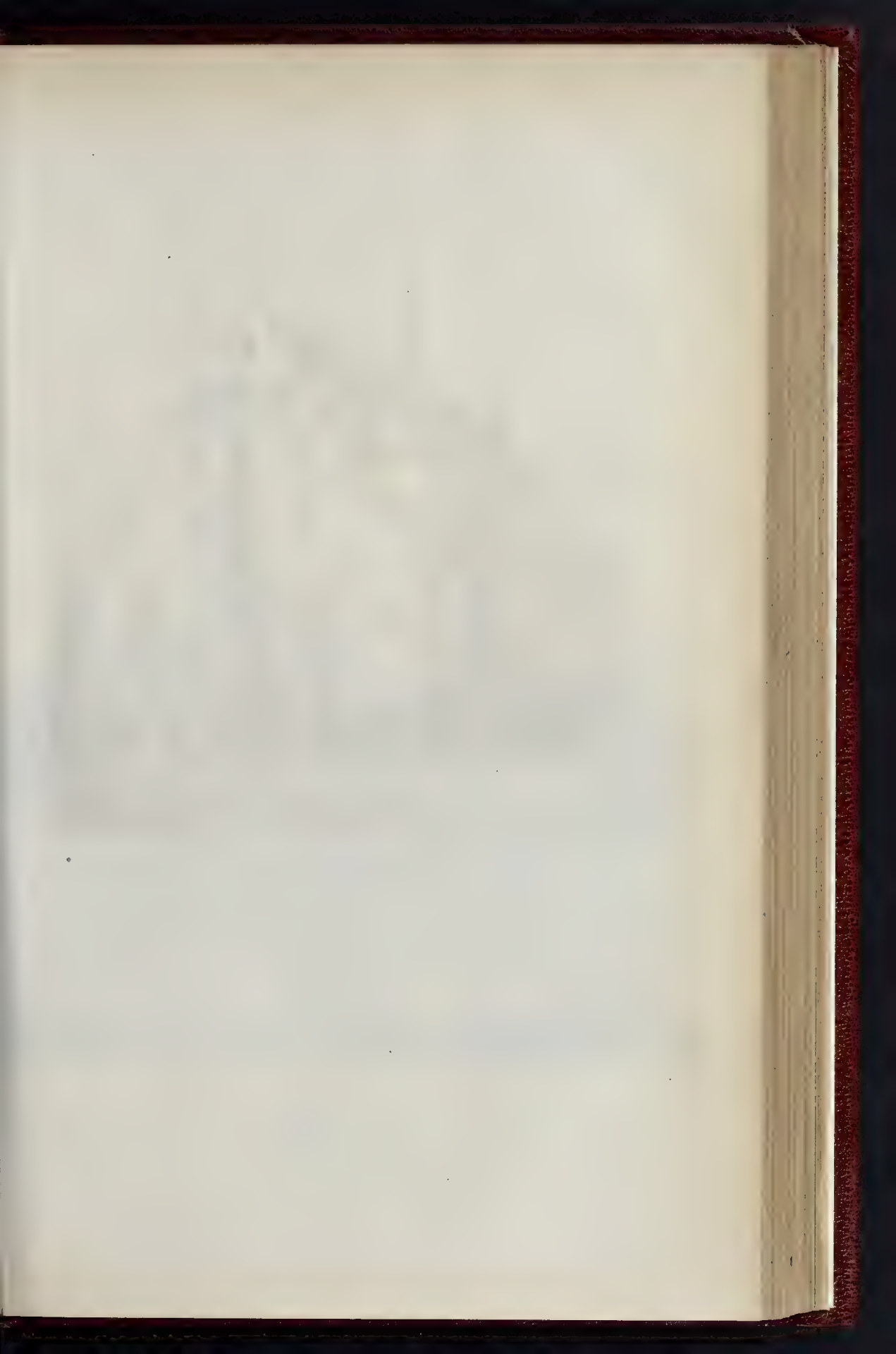
## WING OF THE CLOISTERS OF THE FRANCISCAN CONVENT, BELLPUIG.

BELLPUIG, a small town to the left of the city of Cervera, was the seat of the noble family of Anglesola, who had built a castle there. It is well known to artists, and highly spoken of by Ponz and Colles for its magnificent sepulchre of Don Ramon de Cardona, a *chef d'œuvre* of the Renaissance, transferred in 1841 to the parish church of the town from the neighbouring convent of the Franciscans, where it had been originally erected. In this convent, the façade of which presents few attractions and shows signs of decay, are to be found a well-made spiral staircase adjoining the cloisters, and an inner door of the Pointed style and of beautiful execution, preserving in a perfect state the cloisters, which are a work of the commencement of the sixteenth century, together with a third gallery added to it in the seventeenth century.

These cloisters, part of which we illustrate, form a square, and contain forty arches in its upper galleries. The ground-story has four pointed arches in each gallery, of massive construction and devoid of ornament, and having buttresses terminating in pinnacles. The most graceful portion is the second gallery, each pillar of which consists of fluted sides and sharp-pointed angles. Heavy mouldings project from the base, and twist, like stout ropes, spirally round the grooves of the pillars and arches. The capitals display a great variety of foliage and fruit, as well as fantastic animal forms, all the details of which are carefully executed. The arrangement of the arcade is original, and for this reason is worthy of special attention; the gallery, moreover, being a relic preserved from deterioration until the monastery was abandoned. The third gallery is adorned by elegant Doric columns, which are surmounted by a cornice of great elevation, constructed with much skill.

Altogether, the cloisters of Bellpuig, owing to their originality and lively effect, rendering them a good specimen of the period which they represent, are worthy of notice, and will repay a visit to art-lovers.





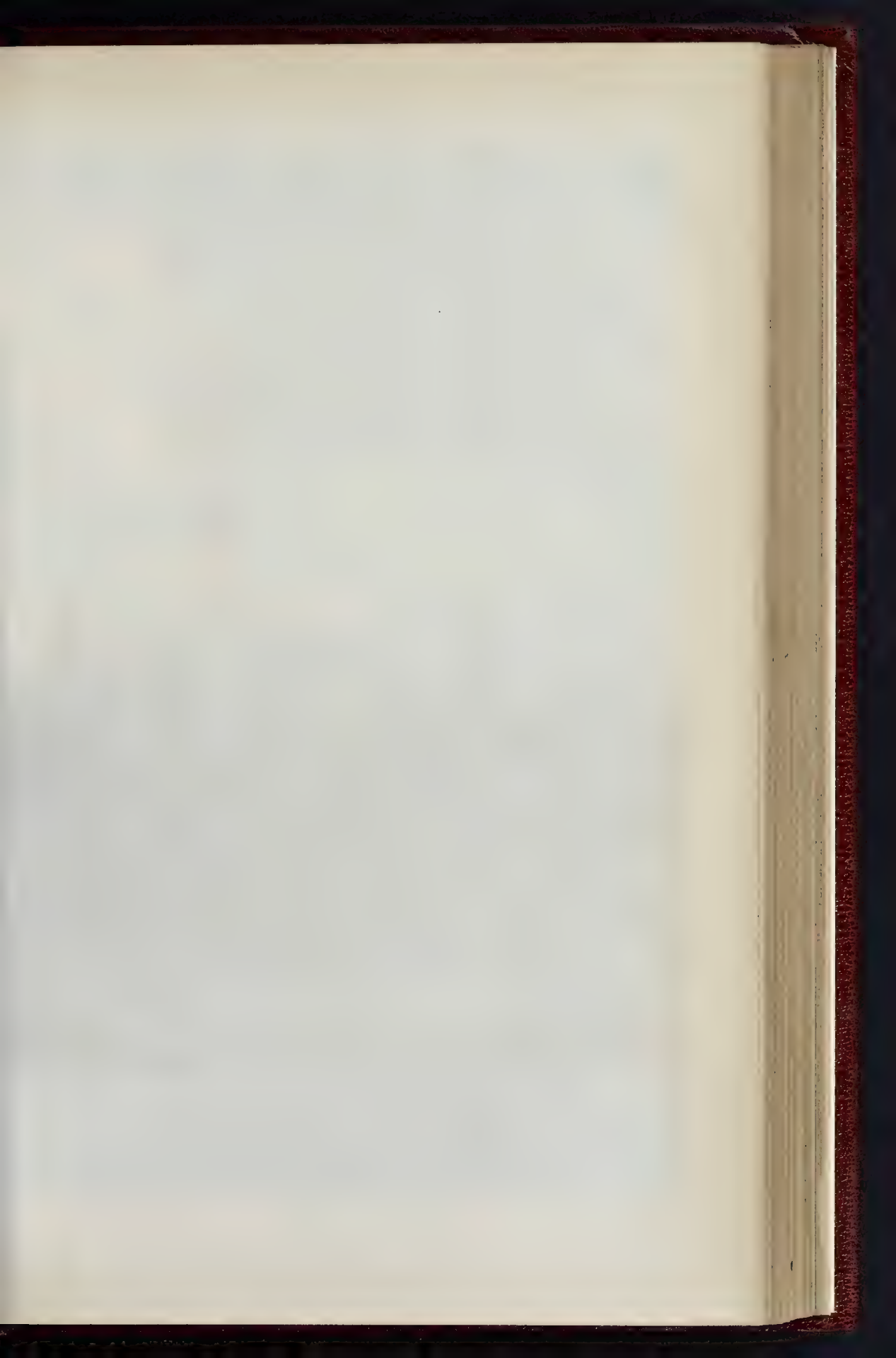


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THE TOMB OF MR. AND LADY MILDRED BERESFORD-HOPE,  
KILDOWN CHURCH, KENT.

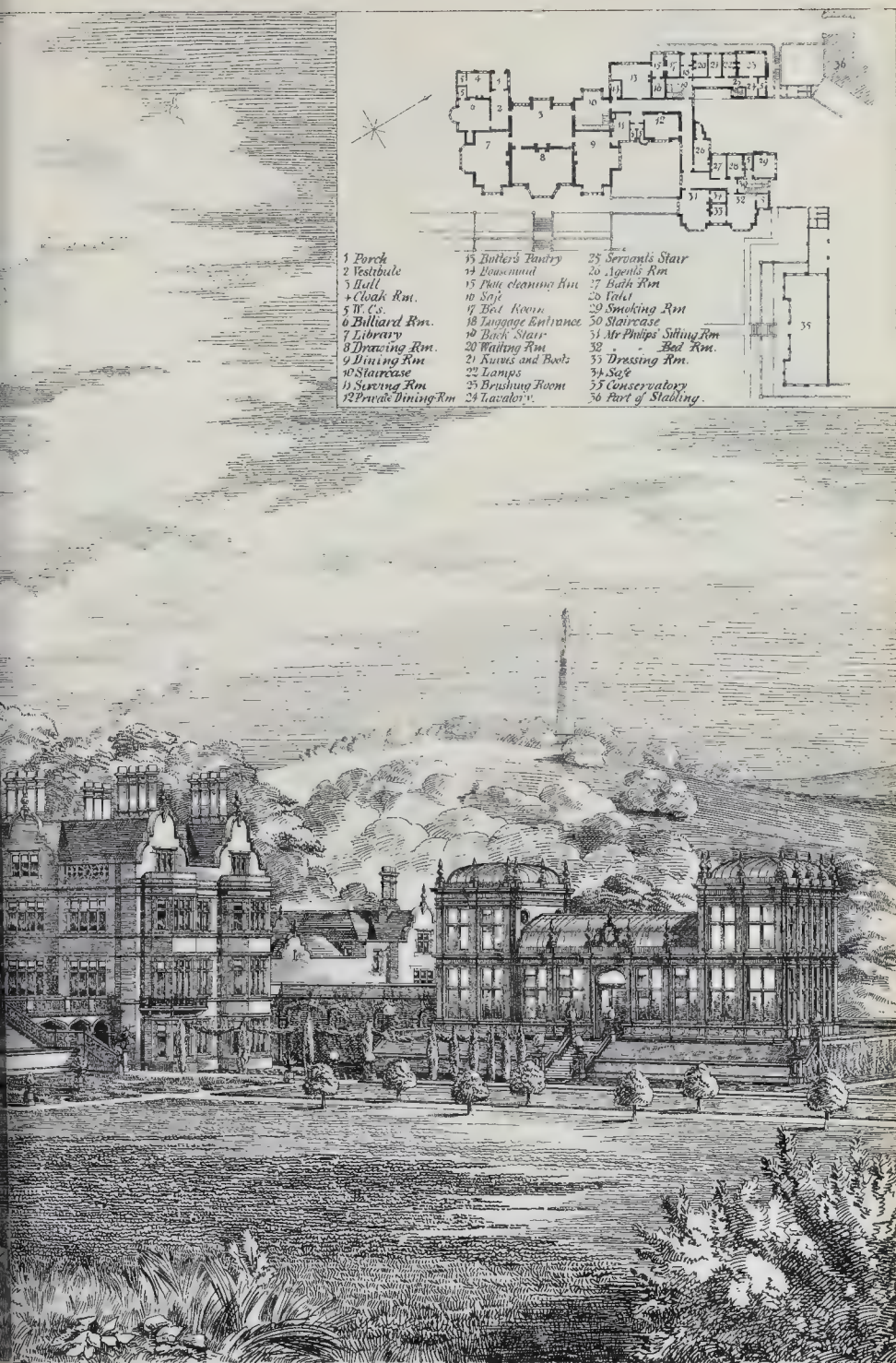
MR. R. H. CARPENTER AND MR. B. INGELOW, ARCHITECTS.





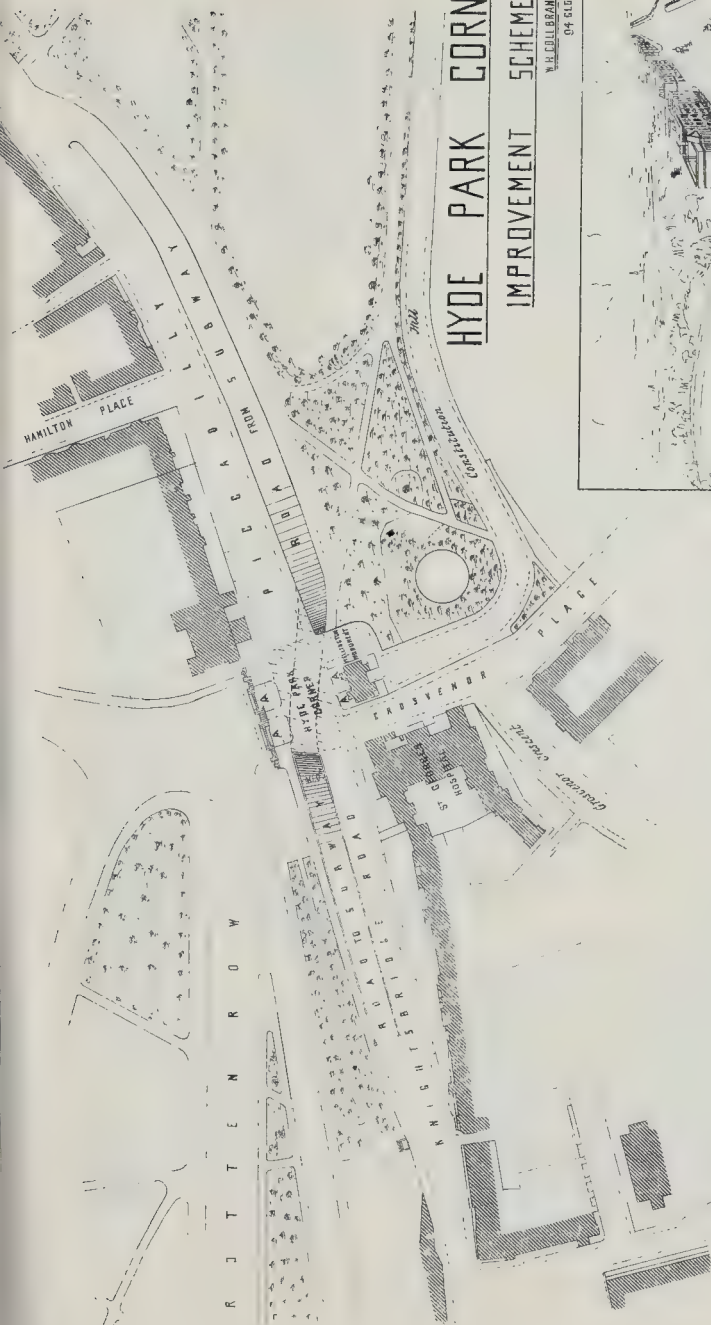






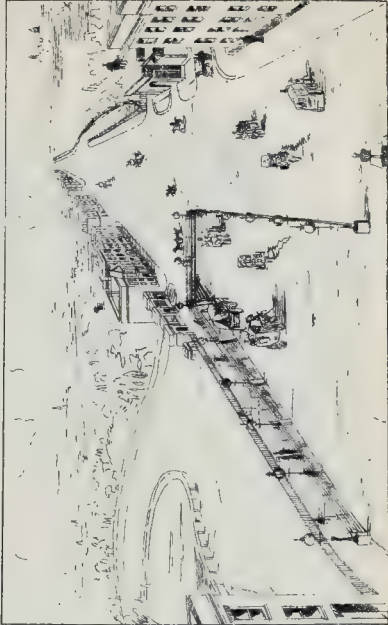






# HYDE PARK CORNER IMPROVEMENT SCHEME

W. H. COLLIER ARCHT  
ON 10/10/1911



Perspective View from Knightbridge



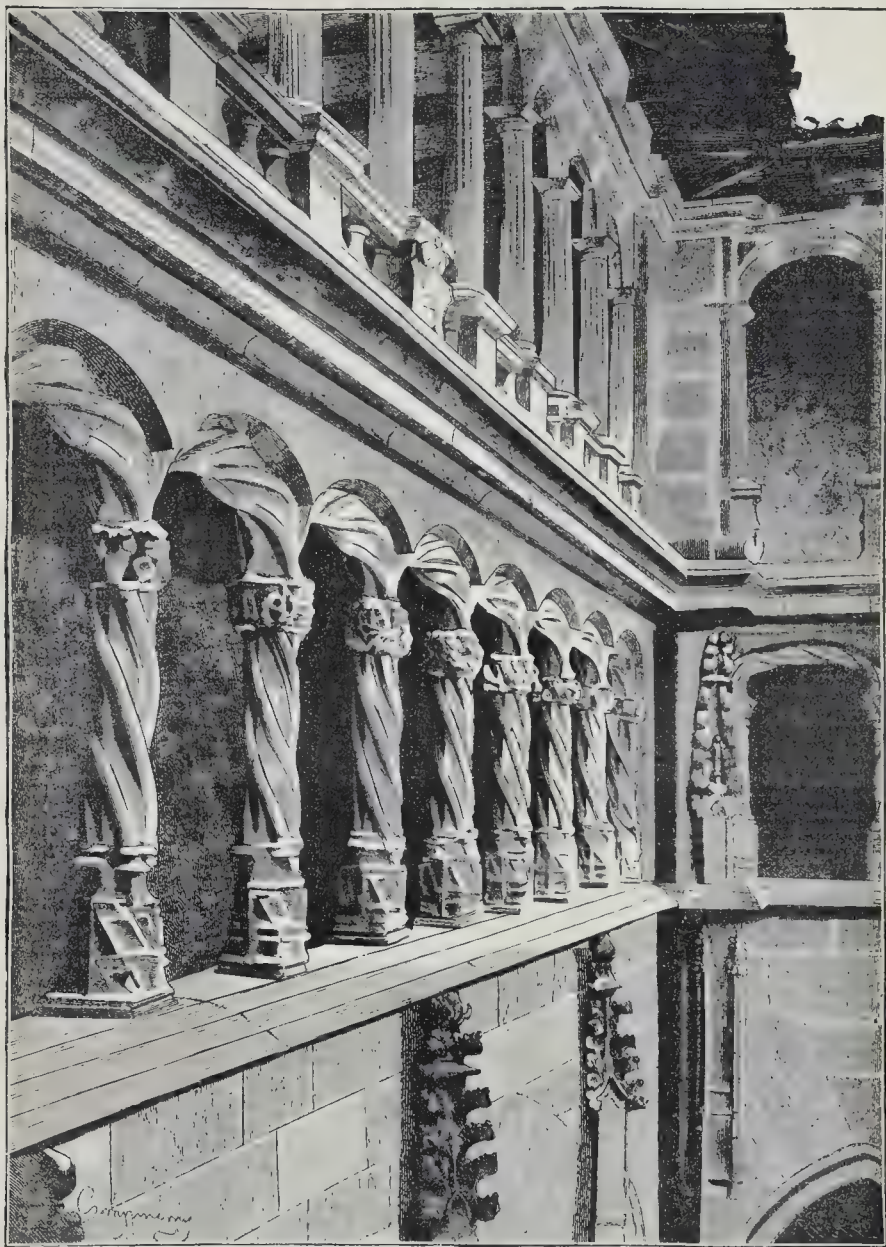
SECTION

W. H. COLLIER ARCHT  
ON 10/10/1911

W. H. COLLIER ARCHT  
ON 10/10/1911







WING OF THE CLOISTERS OF THE FRANCISCAN CONVENT, BELLPUIG, SPAIN.





## MUSINGS ON THE MERITS OF SOME STYLES OF ARCHITECTURE.\*

In what is termed the "Debased" Tudor,—a somewhat unlucky epithet to apply to a style ("Give a dog a bad name," &c.),—there is much worthy of study in secular and domestic work. This is mainly owing to that quietude and absence of fuss which perhaps I may call an English virtue. In ecclesiastical work of the Late Tudor period, however magnificent may be the examples left to us, there is, among other defects, a poverty in the mouldings which is the reverse of pleasing. In this, and particularly in the Elizabethan styles, the treatment of domestic windows is a most striking feature, and I venture to think very successfully managed. Though in themselves more important, external doorways do not, like windows, occur in such numbers and at all levels. Take such an example as Hardwick Hall, Derbyshire. When I visited this splendid old mansion some years since, the first impression left on my imagination was the extraordinary number of windows. It is a perfect lantern in stone. Yet, withal, no one can say that their superficial area, reckoned in the total, is too large, so skillfully are the openings for light equally distributed. There is not the slightest appearance of their being mere holes in the wall. Contrast this for a moment with the now fashionable mode of building windows of good width, and then appearing to correct this by the device of putting a number of little panes, divided by miniature wooden bars.

I fancy that I hear some one asking, "Did not the Tudor and Elizabethan men do the same thing, and push in a quantity of lozenge-shaped quarries, cemented together by lead, thus giving a heavy appearance to the windows and taking away much light, besides having to strengthen the lead by putting the heavy prison-like stauchions and saddle-bars?" My reply to this is that the lead divisions, even though as much as 3-in. wide, threw no shade, and that the amount of light thus obstructed was so infinitesimal as not to deserve notice. I am not, however, advocating the re-adoption of lead-lights, and consider the practice of putting discoloured or painted quarries a half-and-half proceeding.† The Medieval men used quarry glass for obvious reasons. But there is no reason why we should suffer from cold draughts of air, or from the unwelcome intrusion of rain. However good may be the workmanship of the glaziers, the leading may be affected by frost or other inevitable damage. The more joints, the greater room for weak, insecure places. However charming may be the effect of a mullioned window, I believe modern taste generally inclines to some material warmer than stone, actually and apparently. Stone inside a room is chilly to look at, except when the rays of the sun catch it in the chequered light of painted glass, and give that beautiful effect so well delineated by a Joseph Nash or a Horsley. If plate glass is used, some of those first-rate wrought-iron casements can be used, though even if painted a bright tint they have not so warm an appearance as the woodwork sash-windows. Mullions and transoms can also be brightened by colour and gilding, a portion of the natural surface of the stone being left. The old objections against mullions and transoms may be said to have vanished since sash-windows have been accommodated to them, the woodwork outside only showing a very narrow margin, and thus scarcely reducing the clear width of the stone lights. The sashes can easily be locked and unlocked, and lifted up and down, by several well-known new mechanical contrivances, so that the old difficulties of seating pairs of steps, "long arms," &c., no longer exist. The early revivers of the Gothic school perhaps rather prejudiced the public against mullions and transoms by making the small lights too narrow, owing to the considerable projection of the woodwork beyond the one, and sometimes by not sufficiently studying the position of the transom, and placing it here it spoiled the view by cutting across the eye awkwardly. The late Sir Gilbert Scott terminated this complaint should no longer be made, and in his domestic work it will be found the woodwork of the windows shows a

very narrow margin round the stone, rather too much to the concealment of the stiles of the sashes.

After the Tudor style, the Elizabethan came on the scene, and had a long career, merging gradually into the Jacobean. The great distinction, as it appears to me, in the architecture of this period, as compared with the Mediæval, is that it was not entirely new. The Tudor is original, though having its beginning and foundation on prototypes like the Norman or Romanesque, which, commencing with a rude imitation of Classic forms, afterwards developed the undying beauties of the Mediæval school. The Elizabethan, not being exactly the commencement of a new style, but the outcome of that great wave of the Renaissance so worshipped now by a certain section of art-lovers, possesses more diversity in the character of its nearly contemporary examples than is the case with Mediæval work. The Renaissance was possibly more popular in one locality than in another, or longer in reaching different places, so that the mixture of Classic features with Gothic varies much, and, in consequence, the general character of Elizabethan work. I may remark in passing that the term Renaissance has even wider bounds, for the Renaissance "stir" never seems to have ceased since it began, and is continually going through some new phase. It has certainly had a long innings since its commencement in Italy. I think the present great desideratum of architects is some style in which those of all camps can meet on neutral ground. Where there is a common basis action is practicable, and it saves a restless wandering here and there. The work of the Elizabethan period seems to me more suitable to English wants than that later Italian Renaissance so effectively manipulated by an Inigo Jones, a Wren, a Vanbrugh, or a Chambers. I suppose the Queen Anne style is an attempt in this direction, the result of a spirit of architectural charity. Like Elizabethan, it has much of the freedom and abandon of Gothic work, without demanding Mediæval details, though following in the same road and aiming at honesty in principle and substantial construction. The Queen Anne style appears to be the means to an end. Even in its short life how great the changes have been! It has sobered down, become more chastened, less extravagant. The mullion and transom are thoroughly in accordance with the traditions of the Elizabethan period, and it is, of course, optional to introduce the pediment or any other Classic feature. I wish the mullion, &c., could be more a feature in the prevalent style, with which it is quite as much in accordance as in the period of Francis I., where it was so usual.

In Elizabethan work, as may be said of other styles where semicircular arches are the rule, not the exception, the variety in the mouldings is much less than in Mediæval architecture (particularly as compared with that of the thirteenth century in England). It is here that Gothic architecture has the very great advantage, almost, I might say, beyond any other. But I do not see why in these liberal, catholic-minded days it should not be permissible to poach a little on these preserves, and carry off some of their beautiful mouldings. In Greek and Roman architecture, the same want of variety in the mouldings is seen.

One of the most notable features of the Elizabethan period consists in the enriched plaster ceilings, of which there are several distinct types, the variety being great. The manner in which conventional fruit and flowers and grotesques are treated, with so much spirit and cleverness, give much force to the ceilings. Besides these, which are designed in a comparatively flat way, there is another kind with occasional pendants. However handsome and boldly decorative the latter may be, owing to the life and variety they afford, as well as the emphasising of the pattern, they are not very comfortable objects to gaze at, especially in ordinary rooms, where, owing to the limited height, they are nearer the eye and more formidable-looking than if at double the height, though in reality they then would be much more dangerous in case of accident. In practice, however, pendants can readily be made perfectly safe. Plaster has the great advantage of not being in itself costly, while it reflects light when white or of some light tint—always an advantage in this country, particularly in smoky cities. If the ornamentation of a ceiling is to be elaborate and in high relief, there are several materials which can be fixed in slabs without

the paraphernalia of scaffolding and dirt which is inevitable with a wet plastic material. To the architects of the Elizabethan period, therefore, I think we owe a great debt for their practical treatment of the domestic ceiling. There is a good compromise between the plaster ceiling and the wooden one,—I mean a lath-and-plaster surface, to which oak or deal ribs, forming ornamentally devised panels, can be fixed.

In Late Renaissance work there are, of course, very beautiful examples of plaster ceilings, as also in the Adams' style, with its refined ornaments in delicate relief. But there is still a charm in Elizabethan ceilings (not peculiar, I believe, to my own eyes) not discernible in other styles.

To that man who values the "silver streak of sea," who loves the insular character of our architecture (so little imbued with Classic influence as compared with Continental work), and does not want to see wagon-loads of foreign detail carried through a dark tunnel, the Elizabethan, like our own type of Gothic, has the virtue of being essentially British, native of the soil. The terraces, with their picturesque balustrades, set down in an old-fashioned, formally laid-out garden, are another great feature of the times of "good Queen Bess." Who does not well know, at least by illustration, Dorothy Vernon's walk at Haddon Hall, a delightful specimen of a sensible design of balustrade, with the bold circular knobs on the piers, a feature which always tells? There is much more variety in these Elizabethan balustrades than in the more severe Italian work, as intricate geometric and sometimes elaborately floriated patterns abound. The ornamental dressings to bay-windows, and the chimney-pieces, of very varied designs, also form noteworthy features of this period. In woodwork, such as doors and ornamental wainscoting, there is much variety and play of fancy. A loose rein is given, but the curb is still there, to be applied when necessary. Surely it is a mistake to imagine that when designing Gothic panelling, for example, it is always necessary to insert cusping? I think it possible to produce something not inharmonious with that style without some of the more characteristic marks peeping out. Lozenge-shaped and other geometrically-formed panels give much scope for change, and if well moulded have a very ornamental effect. One of the main difficulties where cusping is employed is that it increases the cost so much, owing to the waste of stuff if worked out of the solid. It is a very common remark, and one made particularly by the followers of the Queen Anne school, that however beautiful and suitable an adaptation of Early English or Decorated may be as regards the exterior of a building, yet in the internal fittings the architect is at sea, and has no precedent to follow. That may be true, but so much the better, as more scope for original invention is brought about. Surely a style which had such a successful reign for more than 350 years is elastic enough to adapt itself to all circumstances!

In old houses, it is very usual to see oak wainscoting the whole height of the room, with perhaps, also, an oak ceiling. This is not only very costly,—a thing much to be considered in these days,—but tends to absorb a good deal of light, while it lessens the apparent size of a room. The plaster frieze is more of an Elizabethan or Renaissance feature than a Gothic one, but there can be no incongruity in its connexion with wainscoting. Papier-mâché, carton-pierre, or other such material, could, of course, be just as suitably used.

The complete result of the Classic revival which had been every year more and more permeating the Elizabethan work, is seen in the admirable designs of Inigo Jones, whose reputation, if it depended on nothing else, might fairly rest on the fragment left us of the great palace once contemplated at Whitehall. Perhaps the style is too severe and uncompromising for those who apparently delight to turn tapestry every rule of architectural propriety. Grace, harmonious proportion, good effect of light and shade, all these virtues we find in Jones's works. Happily, the whole design of the palace at Whitehall has been preserved for our examination.

Sir Christopher Wren's treatment of Classic may, I suppose, be considered more free than that of Jones. Certainly, his skilful and original adaptation of Classic details to the purposes of an English spire (a feature previously exclusively Gothic), was very successful. Unhappily, scarcely

\* By Mr. B. Edmund Ferrey. Read at the meeting of the Architectural Association, April 21, 1882. See p. 510.

† In staircases, halls, and in some other situations, staid glass may, of course, be very fitly used. In the case of domestic work only, I was here alluding to the modern practice of inserting quarry glass above the window-transom level.



a year passes without the City of London losing one of these unique examples. It has been alleged by Wren's detractors, as an objection to his dexterity in spires, as in the case of St. Bride's, Fleet-street, or St. Mary-le-Bow, Cheap-side, that it was a poor expedient to pile up order above order in the endeavour to make an elongated pyramidal outline. But the skilful manner in which the translation of Gothic into Classic has been effected ought to disarm all criticism. The task of securing a good outline was even more difficult. In a Gothic spire, if the architect is fortunate enough to get the proper angle, neither too sharp nor too obtuse, and to place the spire-lights so as not to clash or interfere with the pleasing pyramidal contour, all is right. If, also,—this is most important,—the junction with the tower is successfully managed, all is comparatively plain sailing. But, of course, the number of "ifs" have to be very carefully considered. In the Classic instance one has to deal with a series of curved lines next the sky, some of which may look very awkward, and thus injure the effect of all the others. In the Mediæval, there is only in the beginning the oblique outline to be considered as a skeleton, the pinnacles and lucarnes being applied as may seem best afterwards. So, when speaking of the merits of certain styles of architecture, I think the Wrenian spire ought to hold a high place. Wren was ably followed by his talented pupil, Hawksmoor, and afterwards by Gibbs, whose beautiful towers and spires, of bright-looking Portland stone, still, happily, help to embellish London.

Next on my list comes the period of Queen Anne, from which fountain-head so many at the present day draw their inspiration. Specimens of that reign are not very attractive, and seem heavy. Being brought in by William of Orange and his Dutch followers, like most transplantations it did not thrive here so well as in its native clime, where the style was so well adapted to the surroundings. The modern Queen Anne, I need scarcely say, is so different to the old that the foregoing remarks cannot refer to it. I regret that time will not allow me to go into the consideration of the succeeding English styles up to the present day.

And now a few words about some of the Continental styles of architecture. The Romanesque of Germany is very honest and vigorous. Perhaps one of the most striking and characteristic features to an Englishman is the external gallery or deep arcade occurring just below the eave-line of the roof or carried up the raking line of a gable end of flat pitch. Such a detail as this gives force and variety of light and shade to a building externally which no amount of ornament could afford, and redeems it from any monotony or flatness. The multitude of towers and spires to the great German churches (which is a feature also in those of Lombardy) has a very picturesque effect. When the Romanesque in Germany developed into the full-fledged Gothic, some of the charm seems to have fled, and the Frenchmen have the greater advantage in their ecclesiastical architecture. As has been admirably shown by Mr. H. W. Brewer, the Germans had a most happy knack of adapting their buildings to their sites (many of them very romantic), so that in some places it is difficult to say where the ancient rock begins and the human handiwork ends. In the narrow streets of the towns and cities (as notably at Nuremberg) the picturesque of the houses probably cannot be excelled in Europe, not even in Normandy and Brittany. The corbelled-out turrets and other features afford immense variety of sky-line, &c.

The proximity of France has enabled most architects to well study the architecture there, and even those who have not personally visited that country must be well acquainted with its general lines through Viollet le Duc's works. I think it is now very generally admitted that the extraordinary skill with which Le Duc handled his artistic pencil, and his novel and original mode of showing and explaining the driest details of architecture, invested the most prosaic, humdrum subjects with almost a glamour of romance. Were a draughtsman of like subtlety and ability to spring up in England and publish an illustrated dictionary of our English architecture, I firmly believe that, as far as native examples go, an equally good, if not better, assortment would be found.

What shall I call the merits of French Gothic? Perhaps, first, I should mention the boldness and breadth of the earlier types. The conventional stiff style of its sculptured foliage was in perfect

accordance with the surroundings. Then there was the nobility of stone groining, or, at least, stone barrel-vaulting, applied to even the humblest village church. This is more monumental and lasting than the more common way we had in England of using timber roofs, many of which have long since perished through fire and decay, and which, in consequence, have been replaced by miserable modern roofs, or even lath-and-plaster flat ceilings. The cluster of subsidiary chapels, so usual in France to an apse, gives an admirable effect to the interior, which is rare in England, Westminster Abbey, being one of the principal examples.

Turning the other way, and looking at some of the disadvantages of French as compared with English, there is the exaggerated height of some of the churches, the narrowness of the bays and the crowding-in of the windows in consequence; the frequent absence of the triforium stage, except in earlier work; and the great width of the lancet windows. The latter are inferior in effect to our long narrow Early English lancets, which, being widely splayed internally, are by no means niggardly in affording sufficient light. Then the window tracery has but little variety as compared with English Decorated, though I am free to admit that, in the striving for change, forms more curious than beautiful are to be found in some of our late Geometric Decorated windows. Nevertheless, in French windows a want of scale and balance between the parts of the tracery is seen more often than in English work. I have before commented on the merits of the mouldings of the two countries, so need not again enlarge upon them. In Early French work the buttresses, with their long slopes destitute of a projecting drip to each joint, look crude and rough as compared with the delicate drips found in even the plainest and most simple of our village churches. Such treatment is very suitable for brickwork. Ordinary bricks can be used for the purpose by merely cutting off the lower edges where the oblique line impinges on the horizontal. The scooping out to the pyramidal tops of pinnacles or to spires in early French work appears more suggestive of plain tiles or oak shingles (the former of which are often so treated in Surrey and Sussex) than of stone. In masonry I do not know any old English example, except, of course, in Norman work, of which there is a good specimen at Kilmerston Church, near Radstock, in the form of a kind of frieze. Surely in England we managed the treatment of the general field (so borrow an heraldic term) of our spires better than either in France or Germany, leaving the simple unadorned surface generally, but placing bands of panelled ornamentation, as at Salisbury, or as in a modern example, that of the spire to Skelton Church, near Ripon, the design of the late William Bages. Other modes of effecting the same object of enriching the spire were by the adoption of crostings at intervals round it, as at Bunsall Church, near Matlock, or still more commonly by means of pinnacles and spire-lights. All these plans seem superior, I may say, to the openwork spires of Germany.

In spite of one's better judgment, the exuberant richness and grace of some of the work of the Flamboyant period almost forces one to admire it. The discontinuous arch dying into a pier of some simple or circular section, without any intermediate capital, is rarely found in English work, though frequent in late French. With thick walls, it is very effective, as in such examples as the old Parish Church at Clevedon, Somerset, and Lostwithiel, Cornwall, of the Early Decorated period. I have often thought how, in our work nowadays, more might be made of this kind of pier, instead of almost invariably using the cylindrical or octagonal, or other form of pier based on the circle. When churches are built with naves of good width, but with the aisles very narrow and used for little more than passages, the slight additional obstruction caused by the square form is hardly worth attention. In such cases, bricks, or even rough local stone, might be used with perfect safety (by having proper borders), instead of free-stone, marble, or granite.

Respecting the merits of the square and circular-planned abacus, I suppose there will always be difference of opinion. The advocates of the former expatiate on the advantage of having plenty of space for square devised orders of arch mouldings, and maintain that the angles of the abacus afford good reason for special treatment of the carving under them, and thus allow of more variety in the foliage than is possible with a circular capital. They affirm

that there is more boldness in the sharply-defined straight lines than in the softer circular forms. If that be so, it is rather remarkable that in England we are less severe in this respect than in the south of Europe, where the people never thoroughly emancipated themselves from Classic traditions. The circular abacus, too, shows greater changes than the square when examined from different points of view. There is no reason why the two should not be used in the same building, the square in the lower, and probably less decorated portion, and the circular above. Both forms are found in French work. Each is good and appropriate in its way, but as an Englishman I plead for the more general adoption of those features on which the more particular stamp of our forefathers' approval has been placed.

With the consideration of French architecture I am compelled to draw to a close these remarks. When I commenced to write this paper, I had intended to traverse a wider field, and had, in fact, committed to paper a good deal more than I have included in this last revision. The subject expanded and displayed its largeness, and so I found it more prudent to confine my notes to a few styles rather than the many, while permitting myself to branch out when I could reasonably do so. Although I have endeavoured, as far as possible, to avoid quotations from books, or to go over ground already well trodden, it must be obvious that a certain amount of repetition has been unavoidable, as otherwise I should have appeared to have overlooked some leading characteristics of the styles noticed.

Public criticism has frequently assailed modern architects for their want of originality and inventiveness, condemning their worship of precedent and imitation of "past dead styles." Considering that the great Perpendicular era lasted some 150 years, and that the distinctions between the first and the last specimens of it are not so widely different, it is rather hard that architects should be expected now to invent a new style all of a sudden. During the last few years, however, there has been less strict adherence to precedent, and, as I have endeavoured to show, a general movement towards some kind of architecture suited to the present day, though I think it almost impossible in modern times, owing to the facilities of travel and to other obvious reasons, that all practitioners should be in such accord as in the Middle Ages.

It may very naturally be asked, what has been the aim of this lecture? My idea has been to show how much may be learned from the study of past and present styles, both those in England and on the Continent. Therefore, much as I have pleaded for adhering to the characteristics of native architecture, I do not shut my eyes to the great advantages of foreign travel, to which I can testify from personal experience. It is possible to engraft some features of European architecture into our own vernacular without interfering with its insular character. And as I remarked in an early part of this paper, architects are less foreign in their tastes than a few years since.

I have not been standing here as the confidant of any particular school to the foundation of other old and new ones, but have tried to lay before you, quite dispassionately, I trust, some reflections which have been floating on my mind, and so crave permission to leave you to form your own conclusions.

In the discussion which followed the reading of the paper,

The President (Mr. Aston Webb) observed that somehow or other mullions and sashes did not seem to go very well together. If mullions were used, transoms were a necessity if the windows were lofty, and under such circumstances the use of sashes would be unsatisfactory in effect. He quite agreed with the spirit of the remarks made by Mr. Ferrey as to the necessity of looking to the details of all styles for suggestions and ideas, instead of slavishly adhering to one style; and, in fact, he did not see why architects should not, as a body, strive more than they did to make architecture a progressive art, working from and seeking to improve upon the best modern buildings, rather than closely imitating ancient buildings. Let architects closely study the best examples of modern times, in whatever style, taking such typical buildings as the Reform Club, the New Law Courts, the Natural History Museum, or Lower Lodge. Let them find wherein any of those buildings were defective, either in planning or design, and seek to avoid their defects in future buildings.



The pursuit of such a course would be the only means of getting away from the present illogical method of working, and was the only way in which to make the architecture of the present a living art.

Mr. H. W. Pratt, Mr. Trubshawe, and Mr. H. G. Turner also offered a few remarks, the last-named gentleman endorsing the President's remarks as to the study of modern buildings, which, he believed, was the only possible way of arriving at a *Vio* orian style of architecture.

A vote of thanks having been accorded to Mr. Ferry for his paper, he briefly replied, and the meeting terminated.

## THE NEW CHURCH OF ST. MATTHEW, BAYSWATER.

VEINT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last a number of the members of the Architectural Association paid a visit to the new Church of St. Matthew, in St. Petersburg-place, Bayswater, which is to be opened on the 20th inst. The visitors were received by the architect, Mr. John Johnson, and by Mr. Buck, the general foreman of the contractors. The church is noteworthy in several respects, but chiefly on account of the fact that it will afford to nearly every one of its congregation of 1,500 an uninterrupted view of the pulpit, lectern, and Communion-table. It consists on plan of a nave, 98 ft. by 49 ft.; a chancel, 20 ft. deep by 24 ft. 6 in. wide; shallow transepts north and south of the nave, 13 ft. deep, and extending in width across two bays of the nave,—the columns of the nave arcade being 19 ft. from centre to centre; shallow aisles, used only as gangways; a baptistery towards the north-east corner; and a tower at the north-east corner. Owing to the site being on the western side of St. Petersburg-place the usual practice of orientation is not followed; indeed, it is totally reversed, for the chancel is at the west end of the building. Flanking the chancel on either hand are stone galleries of light and graceful appearance (one being intended for the organ and the other for the Sunday-school children). Across the eastern end of the nave will be a gallery capable of seating about 150 persons. With the exception of these and of about the same number in the transepts, the whole of the congregation will be accommodated in the nave. The roof is of kingpost construction, with cusped principals, these and the purlins being of Memel timber stained of a dark colour. The spaces between the purlins are boarded with yellow Memel, stained of a lighter tint, and are divided into panels by means of gilding. The height from the floor to the springing of the roof is 50 ft.; to the point where it is ceiled, 75 ft.; and to the ridge, about 82 ft. There are five bays to the nave, of the width before mentioned, and a narrower bay at the east end. A very noticeable feature in the church is the continuous clear-story, which consists of ten two-light windows, 16 ft. wide by 20 ft. high, on either side, there being two of these two-light windows over each bay of the nave. The roofs of the transepts are kept low so as not to interfere with any of these clear-story windows. There is a very good geometric five-light window at the east end, while at the west end, over the reredos, are three large lancets surmounted by a rose window. The chancel has a groined stone roof, the purlins and transepts being vaulted in concrete with stone ribs. Internally the whole effect is very good, though involving, as will have been seen from our brief description, a departure from the ordinarily accepted traditions of church planning.

The architectural details are simple, and there is no redundancy of carving, but what there is is good. The stonework internally is of Corsham Down. Externally Box Ground is used for nooks, mullions, drips, and for the spire. The tower will be 130 ft. high to the springing of the spire, which will rise a further distance of 90 ft., making a total height of 220 ft. It will thus be one of the highest spires in the West of London. Bargate stone, coming from near Godalming, is used for the walling externally. The general contractors are Messrs. Dove Bros., and therefore it is unnecessary to say that the whole of the work is well executed. The tower and spire are not yet completed, but will be carried up beyond the point which is now reached (some 80 ft. or 90 ft. high) without unnecessary delay. The pulpit, font, and reredos, which are all of stone, have been executed by the contractors, the reredos under the super-

intendence of Mr. James Osborn. The carving of the foliage of capitals, diapers, &c., has been done by Mr. Baird, and the heads and figures by Mr. Lawler. The glazing is by the contractors; the lectern by Messrs. Hart, Son, Peard, & Co.; and the gas-fitting by Messrs. Jones & Willis. The floor is paved with Gregory's patent wood paving, set in pitch on a concrete bed. The cost of the baptistery, including the font, has been defrayed by Mrs. Hunter; and the pulpit has been presented by Mrs. J. D. Allorott, wife of the patron of the living, who has himself been a large contributor to the cost of erecting the church, which stands upon the site of a former church of very mean character. The new church was, in fact, built completely over and around the old one, before the latter was demolished.

## ARCHITECTURAL ASSOCIATION SOIRÉE.

THE Members' *Soirée* of the Architectural Association was held on Thursday, the 27th ult., in St. Andrew's Hall, Newman-street, Oxford-street,—the experience of the last few years having shown that the accommodation in Conduit-street is too restricted for this annual *réunion*. The younger members were, of course, present in full force, and they were honoured by the presence of not a few of those "potent, grave, and revered signiors" of the profession who have always shown a warm interest in the welfare of the Association. The theatrical entertainment comprised two pieces, "Fitzmythe of Fitzmythe Hall," and "A Thumping Legacy," most of the players being members of the Association. In the last-named piece, Mr. M. Rogers, as *Jerry Ominous*, won well-deserved applause. In the first piece, *Fitzmythe* (excellently impersonated by Mr. W. P. Appleton) is a parvenu who, having prospered in trade, buys up the "ancestral hall" of the Fitzmythes, and, at the instigation of his wife, adopts the aristocratic surname of its former owners in lieu of his own very much more plebeian designation. By and by a claimant to the ancient name turns up, in the person of an architect, practising or seeking practice under the assumed name of "Frank Tottenham, F.R.I.B.A.," who promises to forego his right to claim the name of Fitzmythe on condition that the occupier of Fitzmythe Hall will have that ancestral mansion "thoroughly restored to its pristine beauty and grandeur,"—of which, by the way, the "scenery" did not exhibit any traces. The parvenu shows his appreciation of what is meant by "restoration" by exclaiming, "Done! I'll have it thoroughly whitewashed from top to bottom!" It turns out eventually that the supposed architect is only a farmer's son who has assumed the character of an architect, and has obtained permission to sketch some of the "choice bits" about the mansion, in order to make love to the parvenu's daughter, *Penelope*. The acting of Mr. H. D. Appleton as *Frank Tottenham*, of Mr. J. W. Quick as *Gregory* (a man-servant), of Mr. C. G. Killminster as *Mrs. Fitzmythe*, and of Mr. A. M. Rogers as *Penelope*, was very good.

The programme placed in the hands of visitors was embellished by a rather cleverly-concocted and executed pictorial "skit." In the background a number of lads are seen running from their Alma Mater towards a building bearing the letters "A.A." on a tablet over the doorway. This building is characterised not only by picturesque, but by eclecticism in a very marked degree,—symbolical, no doubt, of the freedom of the Architectural Association. Having profited by the lectures, classes, visits to buildings, and other aids to professional competency offered by the Association, the members, attracted by the blandishments of "The Sweet-stuff Man" (who bears a sufficiently exact likeness to the coming President of the Royal Institute of British Architects, Mr. Horace Jones), are rushing helter-skelter across the road to the door of the Institute, over which is the inscription, "Walk up! Walk up! Entrance by Examination!" The "Sweet-stuff Man" has a basket full of medals, prizes, and honourable mentions, and holds other inducements (such as the Soane Medallion, the Pugin Studentship, and the Godwin Bursary) in his hands. Although he is exhorting the members of the Association to "come and be plucked," they are seen rushing in large numbers to the door in Conduit-street (the crush is as great as was that in the wretched little cloak-room at the close of the proceedings, and that is saying

a very great deal for the zeal and numerical and physical strength of candidates for the Obligatory Examination). While, however, there is his rush to the front door of the Institute by candidates for admission as Associates by Examination, one or two persons (labelled "F.R.I.B.A.") are seen entering by a back-door. Among other inducements to join the Institute, placards announce that it has "The Smallest Lending Library in the Profession"; that there are "To be seen within, Portraits of Past Presidents: Whichcord is now added"; and that the "Premises have been re-decorated regardless of expense,—4,000!"

A very pleasant evening was spent by all who had the opportunity of being present.

## "THE CRADLE OF ART."

THE lecture which Mr. Forbes Robertson delivered last week before the Society for the Encouragement of the Fine Arts, upon which occasion Lord Ronald Gower occupied the chair, may be summarised as follows. The subject was "The Cradle of Art," and this the lecturer, who was repeatedly applauded during the evening, unhesitatingly placed in the Valley of the Nile. After describing the physical aspect of Egypt, its flora and fauna and atmospheric peculiarities, and showing the course of the river from the Delta to its bifurcation into the Blue and White Nile at Khartoum, the lecturer passed on to the people and to the earnest and emotional character of their religion, and showed how intimately allied this was with their art. He touched upon the more salient features of their history, and showed that Egypt did not lapse into sensualism till the Ptolemaic period. He referred to the several canons of proportion that prevailed from time to time, and brought forward the theory that the full front eye in the profile face was just as likely to be the result of some hierarchic law as of art ignorance. He maintained that the Egyptians knew perfectly the use of iron, and that the fact had been thoroughly established. It was not quite so clear that in working those remarkably minute patterns in glass so common during the Roman occupation, that they were aided by the use of a magnifier; but the people who understood the use of the blowpipe, the lecturer thought, might possibly enough have stambed upon a globular glass magnifier.

The lecturer was very emphatic, in short, in attributing to the Egyptians much of our Western knowledge, and asserted that in the Nile Valley was not only the cradle of the arts, but of the science, philosophy, and religion of the world.

The remarks of the speakers who followed were all more or less complimentary to the lecturer, and among them were Messrs. Edmondson, Stuart-Glennie, Phéné Spiers, Bertin, Dr. Phéné, and the chairman, Lord Ronald Gower.

Cordial votes of thanks were passed both to the lecturer and the chairman.

## THE LAMBETH ART POTTERY AND FEMALE EMPLOYMENT.

PRESENTATION TO MR. DOULTON.

SOME highly interesting statements relative to the progress and development of art pottery at the Lambeth Works were made last week, the occasion being the presentation to Mr. H. Doulton of an address by the lady artists in the employment of the firm in commemoration of the expiration of ten years since the introduction of female labour. It appears that there are now 250 females employed at Messrs. Doulton's establishment in the art pottery department, and in the address presented to Mr. Doulton they express their obligations to him for the origination of an occupation "at once interesting and elevating to so large a number of our sex." The address goes on to state that each year since the opening of the art studios has seen a large increase in their numbers, and an extension of the variety of decoration. There had also been an extended patronage and appreciation on behalf of art critics and the public, with a continued demand for their productions.

Mr. Sparkes, in presenting the address on behalf of the ladies, observed that the Lambeth School of Art always had a class of design, and it occurred to him about the year 1865 or 1866 that they might as well make their designs on Dutch tiles, in enamel colours, as to do them on paper in water colours. He thought it would open up a vista of the future, but he had no



conception what that future would be. That was their first effort to decorate pottery. In 1867 an international exhibition was organised at Kensington for certain sections of art industry, and pottery was included amongst the exhibits, some of the decorated vessels being noticed by Sir Henry Cole. But it was only in 1872 that Mr. Barlow was asked to give his time permanently to the decoration of stone work, and from that time the art grew slowly but steadily, until at the present time there were engaged in it hundreds of intelligent heads and hands. The growth had been sound, because from the first it was conducted by Mr. Doulton on the only sound basis,—a commercial basis. Lambeth ware had come to the front not only all over England, but in other countries. It had found a place in foreign museums as an instance of what art could do when applied to the humblest materials.

Mr. Doulton, in replying to the presentation, observed that it had been his lot, in conjunction with his father, brothers, and coadjutors, to launch a great many enterprises; but none had given him greater pleasure than the art pottery, which had proved so eminently successful. Speaking of women's employment, he remarked that it was a problem which had presented many difficulties to him, and he was happy to know that the faltering steps which he took some ten years ago had led to so complete and satisfactory a solution of it. Knowing the evils connected with female labour, he confessed that he hesitated at first; but, as in many other cases, action resolved doubt. When Mr. Rix first suggested the employment of girls he was inclined to shrink from it, but they talked the matter over, and that gentleman presented such a well-organised plan that he resolved to try it. The effort, like most good ones, had a small beginning. It was tentative. But the admirable organisation triumphed, and he hoped it had given from that time to this the most absolute and perfect satisfaction. The tendency at the present time was to deal with people in masses,—to make them all go in one direction. But at the Lambeth School of Art Mr. Parkes strove to make each member carry out his or her individual ideas. Many of them, he was aware, had not the imagination to invent; but they had patience, industry, and fineness of touch. Those who possessed imagination let them cultivate it, for imagination was a valuable gift.

#### THE LATE SIR HENRY COLE.

AFTER going to press last week with our memoir of the late Sir Henry Cole, we received some interesting particulars about the architecture and decorations at South Kensington, which we print, thinking our readers may be glad to add them to the memoir. They are as follow:—

It was during the Paris Exhibition of 1855 that Captain Fowke, R.E., the architect of the 1863 Exhibition Building, and of the arcades and conservatory of the Royal Horticultural Gardens, &c., became associated with Mr. Cole. After the Paris Exhibition of 1855, Captain Fowke was attached to the Department of Science and Art, and for eight years designed and planned the various buildings which gradually grew upon the site of ground acquired for the Department, such as the first permanent galleries, with scientifically-arranged top-lights, for the Sheepshanks collection, the great North court, the double Eastern courts, with their roofs of glass, and the inner quadrangle of the Museum buildings, with its façade of red brick and terra-cotta. The style of these buildings (North Italian Renaissance) gave the key-note to that for the pile of the Science Schools in Exhibition-road, which were built under the superintendence of General Scott, who, about 1865, became Fowke's successor. General Scott inherited ideas for the Royal Albert Hall, which Cole and Fowke had brought in 1863 to an almost mature condition. It is not possible here to further touch upon Fowke's work in connexion with South Kensington. A memoir of him was written, with loving appreciation of his great ingenuity and versatile resource, by Sir Henry Cole, for the "Corps Papers of the Royal Engineers."

The greater part of the characteristic ornamental work, the modelled terra cotta, the mosaic panels, the internal decorations of the South Kensington Museum, were, at this time, carried out by an atelier of decorative artists, which Cole organised. The leading spirit of this

atelier was Cole, who secured the services of the late Godfrey Sykes, of Sheffield,—a name well known as that of one of the late Alfred Stevens's most gifted pupils. He and Reuben Townroe, James Gamble, and F. W. Moody, made designs for and carried out all those schemes which Cole delighted to evolve for the distinct purpose of reviving the practice of arts then little used for ordinary purposes in the erection of the public official buildings in this country. Painting on tile, on glass, on iron, mosaic work, modelling for all sorts of metal castings, for terra cotta, &c., were undertaken at the South Kensington atelier; and, as far as possible, students in the art-teaching schools were employed, as part of their course of instruction, to take part in these artistic works. As the buildings were in course of erection, Cole was not only a daily visitor to the architects' rooms and the decorators' studios, but early in the mornings, soon after the workmen's bell had rung, his well-known figure would be seen clambering over bricks, mortar, and girders, up ladders, and about scaffolding.

Everywhere mention that for a novel and space-economising method of exhibiting drawings and such like by means of a series of frames radiating from a movable central pillar or stand, a Medal of Honour was awarded by the international jury at the Paris Exhibition of 1867 to Mr. Cole, the Executive Commissioner and Secretary to the Royal Commission for the United Kingdom.

#### THE LATCHMERE ALLOTMENTS AT BATTERSEA AND THE NEW BATHS AND WASH-HOUSES.

THE parish of Battersea is taking steps for disposing of what are known as the Latchmere allotments for building upon, and from what took place at a meeting of the Local Authorities last week, the appropriation of the allotments for building purposes is likely to be attended with great benefit to the parish. The Local Government Board is to be applied to for power to dispose of the allotments for the above-named purposes. The Rev. Canon Clarke, who presided at the meeting, explained that Battersea was fortunate in having such allotments, but the time had come when, owing to the increase of population, it became very difficult satisfactorily to apportion the 120 allotments among the thousands of men who had equal claims to them. As regarded the portion proposed to be sold to the School Board, they had no option but to sell it, as they were compelled to do so by Act of Parliament. The price to be paid by the School Board for the acre of land they required had been settled at 2,660*l.*, whilst the remainder of the land, if let out on building leases, would bring in annually about 15,000*l.*, instead of 22*l.*, which it now brought in. This sum it was proposed to apply to, among other objects, the building and supporting a free library and baths and wash-houses in Battersea. The allotments had originally been inclosed from waste lands known as Latchmere Common, in 1835, and it would easily be understood how circumstances had altered since then. It was stated at the meeting that both the free library and the baths and wash-houses would be built and supported out of the money so to be obtained from the disposal of the allotments, without coming on the rates at all.

#### CONVERSION OF ROWLAND HILL'S CHAPEL.

ON the 24th of June it will be one hundred years since the Rev. Rowland Hill laid the foundation-stone of the well-known building in Blackfriars-road, designated Sarrey Chapel, and we perceive, by public announcement, that its centenary is, on the above-named day, to be celebrated. It is, however, a noteworthy coincidence that simultaneously with this celebration the conversion of the building, so as to adapt it to business purposes, will be proceeding, for the work of conversion is now going forward. The edifice has been purchased by Messrs. Green & Co., of Leeds, engineers and agricultural implement manufacturers, whose London establishment is at present on the opposite side of the road, and the reconstruction of the building has already been commenced. Although several structural alterations are being made, the external features of the building will, in the main, be preserved, the walls of the old octagonal edifice having been found to be in the most substantial condition.

Mr. Hewson Lees is the architect under whose

direction the reconstruction of the building is being carried out, and Mr. N. L. Wood, of East Greenwich, is the contractor.

#### THE SPECIAL DIRECTION OF ART SCHOOLS.

WITH reference to our notice of the address by Mr. Horsley, B.A., at the Newton Abbott Art School, we learn from the honorary secretary of the school that, incited by Mr. Horsley's address, a movement will be made, at the instance of the Newton committee, for an association of Devonshire art schools, which may afford greater encouragement and direction to the students than they at present receive. The special work which might be developed at Newton was pointed out by Mr. Horsley, and will be fostered and encouraged by the committee, and it is hoped that other schools may discover the special direction which they may follow,—as in Tiverton and Honiton lace designs, &c.,—so that each local art school may make its mark on the industry of its district.

#### TURNER'S HOUSE, QUEEN ANNE STREET.

MR. JOHN BRETT, A.R.A., writes a note warning that the Duke of Portland proposes to pull down Turner's house, still remaining as the great painter left it, and to build offices on the site. Mr. Brett adds, "Let it not be said that no landscape-painter uttered a murmur. I have exhausted the resources of private influence and persuasion,—in vain. I have offered at my own cost to take a lease of the house at the full value,—in vain. I would gladly have avoided this public appeal, but there appears no other course open. Say, then, O British people! are you content to stand by and see this thing done? Have you no right nor inheritance in No. 23, Queen Anne-street?"

#### THE ELECTRIC LIGHT IN CAMBERWELL AND PECKHAM.

IN connexion with the important street improvements which the Metropolitan Board of Works are about to carry out in Camberwell and Peckham, the Camberwell Vestry have decided to take steps with the view of introducing the electric light in the two main thoroughfares within the parish which are about to be widened. This step was resolved upon at the last meeting of the Vestry, on the motion of Mr. John Grumman, which was to the effect that the time had arrived for the Vestry to consider the expediency of adopting the electric light as a more efficient means of lighting these important public roads in the parish, and at the same time enabling the occupiers of the new shops intended to be built to avail themselves of such means of lighting, and that it be referred to the General Purposes Committee to obtain from six companies tenders with the view of carrying out the object.

#### LINDSAY'S IMPROVED TREADS AND LANDINGS.

LINDSAY'S improved patent reversible treads and landings are really such good things that we may serve some of our readers by directing attention to them. The advantages they offer are fully set forth in our advertising columns. They can be turned and shifted so as to be made to endure a very long time under the heaviest traffic, and they admit of the introduction of glass blocks so as to allow light to pass through the treads. We are not surprised to hear that Messrs. Lindsay & Co. are executing a great deal of work, including all the staircases at the New Court Chambers, Serle-street (about 9,000 feet superficial), among which is probably the largest iron circular staircase in existence, being 20 ft. in diameter and 50 ft. high.

**Artisans' Dwellings.**—The improved Industrial Dwellings Company, Limited (Sir Sydney Waterlow's Company) have purchased from the Metropolitan Board of Works nearly two acres of ground in Islington and the Borough. These plots have been cleared under the Artisans' Dwellings Act, 1875, and buildings for the accommodation of about 1,400 persons of the working class will be forthwith commenced.



## NEW WORKS IN BRISTOL.

The Bristol Town Council have accepted the tender of Messrs. Cochrane & Co., of Dudley, for the ironwork of the new Westminster Bridge, and of Messrs. Brock & Bruce for the masonry. The former tender was for 9,200*l.*, and the latter for 1,500*l.*

The designs of Mr. Stuart Colman, Bristol, have been accepted for the erection of a new Board school in Bristol.

It is said that arrangements have been made with Mr. Howell, of Bristol, to build twelve houses in Tyndall's Park, which it is expected will be mainly used as residences for the masters of an adjoining new grammar school.

The tender of Mr. Wm. Chubb, Wapping, Bristol, has been accepted for additional school-rooms to be built for Messrs. Trapnell & Gane, of College-green.

The demand for shares in the lately-formed Great Western Electric Light and Power Company has been very large. Twenty-five thousand shares were to be issued, and before the close of the list of application 100,000 were applied for.

## THE GREEK TRIGLYPH.

SIR.—As our "men of light and leading" (with the exception of the Professor of Architecture at University College) have not accepted Mr. Fergusson's invitation to criticise his theory of the invention of the Greek Doric order and its triglyph; and, as it is a very interesting question, I venture to put down a few thoughts that have occurred to me on the subject since reading his communication. I have always looked upon the truss as an outcome of modern science. Will you, then, allow me to inquire why, at the very outset, he assumes that a timber truss ever existed in Greek or other Eastern primitive buildings? Do not the existing monuments of Egypt and Assyria prove that before 700 B.C. temples and other edifices were covered with flat roofs, or, at least, were not covered with inclined roofs? The illustrations by Sir Charles Fellows of the rock-cut architecture of Lycia, in Asia Minor, show all the details of carpentry,—posts, beams, trenails, mortising, &c.—with studied particularity; but, I think, no indication of truss, plank, or pediment. One or two have a pediment, but are of late date and Greek origin. In the Assyrian sculptures at the British Museum a city is represented, but all the buildings have flat roofs. Scripture mentions house-tops on which people lived and had their beds; and recently you gave Mr. L'Anson's illustration of a house in Cyprus with a flat roof.

Fellows also gives drawings of the modern habits of the Greek and Turkish peasants of Western Asia Minor, for the purpose of showing how identical they are with the ancient tombs in their vicinity. These modern one-story houses have all flat roofs, with the unwrought around section beams (placed close together), projecting 2 ft. or 3 ft. over the eaves.

The triglyph may, as Mr. Fergusson contends, indicate that plank carpentry was understood and used in primitive times, but such evidence as exists appears to my mind to be entirely in favour of the conclusion that no truss existed in pre-Hellenic times, and that we must give the Greeks the entire credit of inventing that beautiful feature, the pediment. Further, we must assign to it a purely æsthetic and not a practical origin. It is difficult, almost impossible, to think of these essentially lithic builders using a wooden truss. They purposely and expressly limited the dimensions of their temples in order to construct them entirely of marble or stone. Of course, we now know that Greek temples had not flat roofs, but we also know that they were so slightly inclined, and (with one or two exceptions) were of such small size, as to present no difficulty of construction without a wooden or other truss. The distance apart of walls and columns was specially limited by such lithic treble-arched construction. My own idea, therefore, is, that in Greek architecture there never were any trusses at all, but only walls built upon the massive ceiling beams p to the roof-line, which carried transverse stone rafters, which ultimately carried the marble tiling and its joint covers. With such slight inclination of roof, and such massive and light construction under it, the question of upward would scarcely arise. As regards the triglyph, and as plank construction so early as this is too doubtful to be of much use in the argument, is it not enough to admit,—as all, I

think, do,—that it represents the end of the ceiling-beam? May not the glyphs indicate the grain of the original wooden beam? And as regards the gutters, may they not rather represent water-drips than trefoil-heads?

As we know from Mr. Fergusson's interesting work that no one is more anxious than himself to state an argument fairly and logically, and as I, for one, cannot on this occasion accept his deductions as conclusive or even satisfactory, I have ventured to put down the above considerations as having some bearing on the proposal he has invited us to criticise. HENRY TRAVIS.

## BUILDING PATENTS \*

## APPLICATIONS FOR LETTERS PATENT.

1,916. T. A. Riggs, Aldeburgh. Combination of substances for the manufacture of bricks, &c. April 23, 1882.

1,920. J. Keith, Edinburgh. Heating apparatus. April 22, 1882.

1,959. J. Norr, East Ham, and H. Salomon, London. Manufacture of ornamental surfaces for building, &c. April 25, 1882.

1,966. W. Begg, Sale. Apparatus to be applied to furnaces for the prevention of smoke. April 22, 1882.

1,974. I. Henson, Derby. Barns and shelters, with rising and falling roofs. April 28, 1882.

1,975. T. E. Bladon, Birmingham. Ventilators and chimney cowls. April 26, 1882.

1,979. J. Baresford, Birmingham. Urinals. April 26, 1882.

2,001. F. Dyer, Camden-town. Manhole-covers for drains, &c. April 27, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named.

April 25, 1882.

5,554. B. C. Cross, Dewsbury. Fastening, &c., window sashes. Dec. 19, 1881.

5,576. H. S. Cregeen, Bromley. Heads and gratings for air inlets, &c., for soil-pipes and drains. Dec. 22, 1881.

65. H. H. Lake, London. Construction of bridges. (Com. by G. Eiffel, Paris.) Jan. 5, 1882.

April 28, 1882.

5,677. J. Barrett, Eastburn. Apparatus for opening and closing doors in connexion with hoists. Dec. 27, 1881.

5,703. F. Brown, Luton. Cooking and other stoves and fireplaces. Dec. 28, 1881.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending April 29, 1882.

3,862. J. Dunnachie, Glenboig. Regenerative kilns for burning fire-bricks, &c.

In order to make thoroughly mix the gas and air burnt in the kilns, and to regulate and equalise the heat therefrom, in the walls of adjacent kilns are constructed duplex flues through perforations, in which the heat is passed from one kiln to the next. These flues are fitted with dampers. Another set of flues is constructed at the upper part of the kilns, also with perforations, to admit either hot or cold air as may be needed. Sept. 6, 1881. Price 6*d.*

3,972. S. C. Davidson, Belfast. Stoves or heating apparatus.

The products of combustion from a coke or charcoal fire are mixed with air and drawn direct through a drying chamber to dry the substances therein. The fire-place is constructed within a casing, the top of which fits the base of the drying-chamber. On the top of the fire-place is placed a baffle plate to cause the hot gases to diverge to right and left, and mingle with the cold air admitted to the casing. Sept. 14, 1881. Price 6*d.*

4,010. J. Emery, London. Cooking-stove.

This has a double cylindrical casing, the annular space between being filled with sawdust. The fire-box is placed in the bottom, above which is the boiler, the bottom of which is hollowed upward to receive the hot products of combustion before they pass round the edges and escape to the flue. (Com. by La Société des Spécialités Mécaniques, Paris.) Sept. 17, 1881. Price 6*d.*

4,050. A. Martin, Woolwich. Springs for doors, &c.

The spring is fastened to the door, and the other end joined to a link which is secured to the frame. (Pro. Pro.) Sept. 20, 1881. Price 2*d.*

4,054. E. de Pass, London. Concrete materials.

This uses granite or stone, &c., with asphalt and mineral oil. The stone is pulverised and mixed with the oil, and then heated and mixed with the asphalt in a melted condition, then pressed into moulds and cooled. Sept. 20, 1881. Price 2*d.*

4,077. Sir C. H. Pennell, New Quay. Apparatus for holding and controlling blind and other similar cords.

The check-string or cord passes through two plates of

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

wood, the compression of which, acting on the check-string, regulates the action of the blind. (Pro. Pro.) Sept. 21, 1881. Price 2*d.*

4,090. W. Saunders, Stepney. Implement for cleaning floors, &c.

This is a combined brush and "equegee." (Pro. Pro.) Sept. 22, 1881. Price 2*d.*

4,103. J. Harding, Westminster. Combined cramp nail-driver, punch, and gauge, for use when working flooring and other boards.

This machine consists of a cramp for fixing the boards, actuated by a lever and ratchet, the handle thereof gripping the joist, in combination with a nail-driving machine, which has a plunger working in a tube, to which the nails are fed, when the plunger moves down and drives the nails home. (Pro. Pro.) Sept. 23, 1881. Price 4*d.*

4,109. M. F. Rust, London. Curtain-rollers, &c.

The roller is mounted on brackets, and on one end is a spool which receives the cord for revolving the roller, and also a ratchet wheel for holding the curtain in the desired position by a pawl attached to a cord lever. The winding cord is passed through an eye in this lever to keep it always in position. (Pro. Pro.) Sept. 23, 1881. Price 2*d.*

4,119. A. M. Ross, Edinburgh. Laths for Venetian blinds.

These laths are made of wood, covered with paper. (Pro. Pro.) Sept. 24, 1881. Price 2*d.*

4,342. T. Fletcher, Warrington. Gas stoves.

These stoves combine visible illuminating flames of gas with a series of tubes, open at both ends, and so arranged that the heat from the flames induces a current of air to pass through them and become heated. Oct. 6, 1881. Price 2*d.*

5,543. C. F. Schlickeyesen, Berlin. Brick-moulding machines.

The pressing cover is lifted or shifted by hand, and various arrangements are shown for effecting this in the proper manner, and stated in eleven claims. Dec. 17, 1881. Price 6*d.*

## PROSECUTION OF A BUILDER BY AN ARCHITECT.

A TRIAL of some importance, under the Malicious Injury Act, in which the prosecutor was an architect and the accused a builder, took place at the Surrey Sessions last week.

Mr. John Flynn, a builder, of Anerley-road, was charged under the 24th & 25th Vict., chap. 67, of the Malicious Injury Act, for injuring the property of Mr. Alfred Norwood, the property of Mr. Sheffield, an architect. It appeared from the statement of the case, and the evidence submitted on behalf of the prosecution, that the defendant was employed by the prosecutor to erect certain houses at Norwood. During the time the houses were in course of erection, a dispute arose between the parties respecting money matters, resulting in the defendant removing several window-sashes from the houses, which the prosecution alleged came within the meaning of the Act as a malicious injury.

On the part of the defendant, it was contended that no malicious injury to the houses was either committed or intended, and the alleged offence could not be construed as coming within the meaning of the Act.

The Chairman having summed up the evidence given on both sides, and directed the jury as to what constituted malicious injury under the Act, a verdict of Not Guilty was returned.

## LIABILITY FOR HOUSE-REPAIRS UNDER THE PUBLIC HEALTH ACT.

THE MAYOR OF SUNDERLAND v. ALCOCK.

THE question raised in this case (which came before Mr. Justice Kay, in the Chancery Division of the High Court of Justice on Monday last) was as to the right of a corporation to recover expenses incurred under the Public Health Act from persons who had become owners of the property after the works were completed.

In the year 1877 the Corporation of Sunderland, after giving the proper notices under the Public Health Act of 1875 (38 & 39 Vic., chap. 55), executed certain sanitary works in Ward-street, Sunderland, and apportioned the cost on the houses in the street. The Corporation did not proceed to recover the money in the summary manner provided by the Act, but in August, 1880, they brought this action against the defendant, Samuel Alcock, who was not owner at the time the works were executed, but had bought the houses in 1879, claiming that the sums apportioned might be declared a charge on the houses, under the 257th section of the Act, and might be raised accordingly. The section alluded to provided that where any local authority had incurred expenses, for the repayment whereof the owner of the premises for the time being was liable, such expenses might be recovered, with interest at five per cent., from any person who was the owner of such premises when the works were completed for which such expenses had been incurred, and until the recovery thereof the same should be a charge on the premises in respect of which they were incurred.

For the defendant it was contended that the person liable was the owner of the houses when the works were done, not a subsequent purchaser.



Mr. Justice Kay said there was no doubt that the Corporation might have recovered the money from the owner at the time the works were executed by summary process. The time for that had now expired, and on the construction of the Act his Lordship was of opinion that a charge on the property was created, and that the mere negligence of the Corporation did not deprive them of the right to a charge. Nor was there any hardship in holding this view, as the defendant was aware of the state of things when he purchased. The plaintiffs were, therefore, entitled to recover, and the defendant must pay the costs.

#### A QUESTION OF LIABILITY: WORK DONE TO ARCHITECTS' ORDERS.

HEMS V. HAWKINS.

In this case, which came before the Kirkham (Lancashire) County Court a few days ago, Mr. Harry Hems, of Exeter, sued the Rev. H. B. Hawkins, Vicar of Lytham, to recover 5l. 9s. for work done. The case was heard in the absence of the defendant, who was stated to have gone to Palestine, although he knew that these proceedings were to be taken against him.

The Plaintiff stated that in the early part of 1880 he received from Mr. Forrest, architect, Lytham, a drawing of a memorial tablet to be executed by Rev. H. B. Hawkins, in memory of his wife. It was proposed, the plaintiff added, to put the tablet in an oak frame, and erect it in a class-room of the school at Lytham. He executed the tablet, and forwarded it to Mr. Forrest, who had, in the meantime, removed to Birmingham. He subsequently sent in his account to Mr. Forrest to be certified, and afterwards applied to Mr. Hawkins for payment. After giving further evidence as to the correspondence between the parties, the plaintiff left the case in his Honour's hands.

His Honour held that the evidence altogether failed to connect Mr. Hawkins with the transaction, further than that his name was placed on the tablet.

The plaintiff said he received his order from the architect, and it was the custom of the trade to do so, and to look to the architect's client for payment.

The plaintiff was non-suited, with liberty. Mr. Wilson, who appeared for defendant, applied for costs and advocate's fee. The fee (15s.) was allowed.

The plaintiff at once paid the money, and also threw on the table an additional guinea, which, he observed, was the fee of the advocate he should have employed, and asked his Honour to allow the money to be put into the poor-box.

#### AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

THE twenty-second annual report of the Amalgamated Society of Carpenters and Joiners has just been issued. Mr. James S. Marcbie, the general secretary, in his opening remarks, says:—

"The year 1881 opened with anything but cheering prospects for us. A reference to the February monthly report will show that we had in January 2,690 members on unemployed benefit. As the season advanced the numbers gradually decreased. The effect, however, was so severe, that at the end of the March quarter our cash balance fell for the first time below 2l. per member. On the 4th of June the society had reached its twenty-first birthday, and at the end of that month we found that the balance had still further decreased; but from this point a decided change for the better took place, and trade gradually improved. In the first half-year we lost 7,611l., and saved 7,175l. in the second half. I feel no anxiety about the future. The improvement in trade which has set in will be of a permanent character, and we can confidently look forward to a speedy return of some of those prosperous times which existed in the building trade for some years previously to the year 1877. Between December, 1877, and June, 1881, we not only spent the whole of our income, but 45,231l. of our accumulated capital, and all this has been accomplished without asking you to contribute one single penny more than was fixed in our rule in 1860. Personally, I do not seriously grieve about the loss, because we have our great recompense in the knowledge of the vast amount of good this money must have done. It has gone into the homes of the members in the hour of their need; it has aided us to tide over a period of depression unparalleled in the memory of the oldest members of the society, and it has enabled us to prove to the thousands of non-society men who still hold aloof from us that what we have promised we have performed. We have opened twelve new branches during the year, six of them in England, two in Scotland, one in Ireland, one in the United States, one in Australia, and one in New Zealand. Through slackness of trade, and the consequent migration of members, we have been compelled to close three branches,—one in England, one in

Canada, and one in New Zealand. We have added 1,001 members to our numerical strength, making a total of 18,765, being the largest increase since 1876. We have admitted 2,804, and excluded 1,294 members. This is the least number of excisions since 1871, and a less percentage than any year since the formation of the society. Our income for the year was 41,714l. 5s. 7d., or an increase of 2,541l. over the previous year. Our expenditure was 45,139l. 18s. 4d., or 425l. 12s. 9d. in excess of our income. Though this is a loss on the year, yet it compares very favourably with 1880, when our expenditure exceeded our income by 12,879l. 19s. 1d., or with 1879, when the loss was 22,591l. 3s. 11d. It is, however, very satisfactory to know that, at the end of the year, we had a cash balance of 40,960l. 16s. 6d., and, after a very careful valuation of the buildings and other property, we find a grand total of 46,111l. 9s. 6d., or 2l. 9s. 13d. per member. Our expenditure in unemployed benefit was 19,322l. or 1l. 6s. 5d. per member, being 2,740l. less than the previous year. In sick benefit we have expended 12,554l., which is an increase about proportionate to the increase in members. Compensation for tools lost by fire, water, or theft, cost 1,035l.; funerals, 2,174l.; accidents, 1,050l.; superannuation, 655l.; benevolent grants, 757l.; grants to other societies, 1,000l.; and legacies, which, as you are aware, is an item covering what is known as strike pay, arbitration expenses, expenses of the management of all trade movements, and law expenses, we expended the very small sum of 732l., or 9d. per member. This is the smallest sum which has been expended under this heading for the past eleven years, although our assets have nearly doubled during that period. Since the formation of the society we have expended in the various benefits and benevolent grants no less a sum than 378,181l., or 37l. 7s. 4d. per member. This may provide food for reflection to those gentlemen who, a few years ago, so solemnly assured us that trade unions could accomplish no good object. The Employers' Liability Act came into operation at the beginning of the year; we have thus had an opportunity of watching its progress. I am sorry to find that while the Act has been a great boon to working men, yet there are some defects in the measure which have limited its power for good. It does not appear to me that any justification can be found for the permissive character of the Act, and the Parliamentary Committee of the Trade Unions Congress have resolved to make a strong effort to induce Parliament, along with other very necessary improvements, to insert a clause which will render it impossible for either employers or workmen to contract themselves out of its provisions. A careful review of the past history of the society must be a matter of pleasure to every member. According to the census returns for 1871, there were in England and Wales alone 205,000 persons returned as carpenters and joiners; the numbers for Ireland and Scotland are not so easily attainable, as in most places the building trades are given in the aggregate. I am, however, quite assured that I am under the mark in stating that the total number of persons engaged in our trade was a quarter of a million in 1871. The returns for 1881 are not yet issued, but I am justified in assuming that the number has increased in proportion to the increase in the population."

#### COMMUNICATION FROM THE STRAND TO CAREY-STREET.

Str.—Your recent correspondent on the roads to the Law Courts, in describing the crowded state of the Strand and the difficulty of crossing, appears entirely to have lost sight of this most important local matter.

If some means are not taken by the Vestry of St. Clement Danes and the Strand District Board of Works to insist with the Commission of the New Law Courts and others in authority, it will certainly be found out some fine day, utterly to the surprise of everybody going from Lincoln's Inn Fields, Carey-street, &c., that the communication formerly existing between Carey-street and Portugal-street is altered six, or a certain hour, closed, and will find the very unpleasant state of things of having to wind their way all round Carey-street, Blackmoor-street, and all manner of dirty little streets, before they can get into the Strand. For it is perfectly plain that a screen with iron rods will be fixed at the Strand end and at the Carey-street end of the Law Courts, and at a certain hour will be closed to the public, without a very strong protest is made that this communication from Carey-street to the Strand be kept open night and day, and so save the public and the residents of the immediate neighbourhood from going a mile round. As it is now, it is a great inconvenience to find, after six o'clock, New Inn and Clement's Inn closed, and to be obliged to go all round to get into the Strand.

R. PAYNE.

The Society to Open Museums and Galleries on Sundays.—The seventh public annual meeting of members and friends will be held at St. James's Hall on Wednesday, May 17, 1882, when Viscount Powerscourt, K.P., will preside.

#### ARCHITECTS' QUANTITIES.

NEW MODE OF PAYMENT.

Str.—It appears, by the letter of the architect of the Hendon Union (in the *Builder* of last week), that he was induced to adopt his new mode of payment for quantities and lithography by the builder before he gave him a certificate because "one or two builders had not paid for their quantities out of the first certificate." Surely that is not a sufficient reason for doing away with the old mode of payment and doing such an act of injustice to the builder? When the quantities are taken out by a quantity surveyor, he invariably endorses them with his name and address, and readily gives any information asked.

I have inquired, and find that no such endorsement is on the quantities for the Hendon Union. It is certainly more profitable than orthodox for architects to take out their own quantities, and to be paid for them before a certificate is given.

J. P.

Str.—With reference to your correspondent, "J. P.," of the 22nd ult., and Messrs. Saxon Snell & Son's answer thereto of the 29th ult., and my tender being accepted for the works referred to, viz., Hendon Union, I beg to say that the instructions were entirely without my knowledge.

H. HAYNES.

#### DAMP WALLS.

Str.—In the last issue of your paper we observe a letter signed "D. P.," referring to damp rising up the walls of a chapel. Will you oblige us by answering him to the following effect?

Edward Alnshouses, in Church-street, Blackfriars-road, were made almost uninhabitable by the damp rising up the brickwork. They were underpinned with Taylor's patent damp-proof course, and they are now perfectly dry. This damp-course was supplied by the Broomhall Tule Company, of Cox's Wharf, Upper Ground-street, Blackfriars Bridge.

A. B.

#### CHURCH-BUILDING NEWS.

North Curry.—The parish church of North Curry, near Taunton, has been re-opened, after restoration. The plans for the restoration of the building were prepared several years ago by the late Sir Gilbert Scott. At that period, however, for want of funds, the matter fell through. Two years ago it was again taken up, and the services of Mr. J. Oldrid Scott were secured to superintend the work. The entire cost of the restoration of the nave was 4,000l., and of that amount Major Barrett contributed 2,000l. The cost of restoring the chancel was 1,000l., and that amount was granted by the Ecclesiastical Commissioners. In the work of restoration care has been taken to preserve all the more remarkable features of the church. The original oak roof still exists immediately under the tower, and respecting that it is worthy of remark that the eastern portion is decorated and carved, whilst the other is left plain. The decorated porch has, in Reformation times, been immediately over the roof-loft, forming a canopy for the rood, and overshadowing the screen and loft which, in bygone days, were there. It is worthy of note that while the work of restoration was being carried out in the north aisle, a fireplace was found at the west end. In removing the plaster from the walls above the arcade, and which disfigured that portion of the building, some remarkable clerestory windows were discovered. These windows are small and oval-shaped. The stained-glass windows which have been introduced form an important feature in the restoration. That in the eastern extremity of the chancel, which has been provided by the vicar and his family, has five lights, and it bears in the centre light a representation of the Crucifixion; on the left St. Mary and St. Peter; and on the right St. John the Evangelist and St. Paul. The whole of the stained glass, with the exception of the west window, has been executed by Messrs. Barlison & Grylle, of London. In the south transept is a window, given by Major Barrett, in remembrance of John Scott and Sophia Gould, and there is a small memorial window at the east end, erected by the same gentleman. On the south side of the chancel is another memorial window, erected to the memory of the late Charles Millard Foster, of North Curry. On the south side of the altar is a memorial window, accompanied by a memorial brass, given by Mrs. Elliott, of Bath, in memory of Robert Harper Scott, and Mary his sister. The west window, executed by Messrs. Heaton, Butler, & Payne, has been provided by subscriptions raised by Mr. R. P. Olvey, in memory of the late vicar (the Rev. Christopher Harrison) and his son, who was killed in the Zulu War.



The pulpit, which is entirely new, has been built of Ham Hill stone, with open tracery in Perpendicular style, carved by Mr. Harry Hems. A new oak roof has been erected in the chancel, which has taken the place of a ceiling one, and it now corresponds with the early roof of the building. The arcade and wall of the north aisle was in such a state of dilapidation that it was almost crumbling to pieces, and it required reconstruction. The floor in the chancel has been lowered considerably to its original line. The stalls are entirely new, as no remnant of the earlier stalls existed. The doors are also new. The door leading to the roof-loft has been opened up. The church contains 420 sittings. The heating apparatus has been fitted up by Mr. Haden, of Trowbridge. The work of restoring the organ was entrusted to Messrs. J. Clarke & Son, of Bath. The chancel, as has been already stated, has been restored by the Ecclesiastical Commissioners, under their architect, Mr. Ewan Christian. The contractor was Mr. Traak, of Stoke-sub-Hamdon. Mr. Hannaford was the clerk of the works.

**Timberscombe.**—Timberscombe Church, Somerset, has been re-opened, after restoration. The church was built about 1450. The plans for the restoration were prepared by Mr. J. D. Sadding, the diocesan architect, and the contract was entrusted to Messrs. Pearce & Son, of Minehead. The whole church has been stripped of plaster and painted, the windows restored and glassed, and the segmental arches in the ball-chamber of the tower taken out and replaced by freestone windows with louvre lights. The old parapet of the tower has been removed, and replaced by one of stone. The roofs of the porch, nave, and south aisle are almost all new. The gallery has been removed, and the whole of the old seats have been given place to new ones made of pitch-pine, some of the old seat-heads being, however, again used, and the new mouldings carved after the original design. The font (dated 1450) has been restored, and the screen, which was in a rotten state, has been repaired and decorated by Mr. Jeboult, of Taunton. In addition to the above, two painted windows have been placed upon the edifice. One of these (by Wailes & Strang) is in the nave, and is the gift of Mr. W. N. Rowe, of Tiverton, in memory of his grandfather, Mr. Samuel Kent, of Start, Outcombe. It consists of the figures of Moses, the Good Shepherd, and St. Paul. The other, in the east end, is contributed by the Misses Croft, as a memorial of their late father, the Rev. J. H. Croft, who was vicar of Timberscombe for twenty-three years. The work has been executed by Messrs. Clayton & Bell, and the design comprises the Crucifixion, St. Mary and St. John, and three works of mercy in our Lord's Life. The cost of the restoration has amounted to about 1,130*l*.

**Tonge Moor (near Bolton).**—It has been decided to proceed at once with the erection of the proposed new church at Tonge Moor, near Bolton. Plans have been prepared by Mr. R. K. Freeman, architect, of Bolton. The sum required for the building and partial endowment of the church is estimated at 4,500*l*, towards which 1,000*l* have been already promised.

#### STAINED GLASS.

**Northampton.**—It has been resolved to apply for a faculty to place a stained-glass window in the Sepulchre Church, Northampton, in memory of the officers and men of the 53rd Regiment who were killed at the battle of Laing's Nek, in the recent Transvaal war. The design is by Messrs. Mayer & Co., and represents Richard de Lion and the Crusaders at the battle of Hattin, A.D. 1187, fighting for the recovery of the Holy Sepulchre at Jerusalem. There are four panels, the two first representing Richard and the Crusaders, and the opposite two the rancors. At the head, on the left hand, is a globe, appear the Castle and Key with Gibraltar, and on the right the Sphinx, with Egypt, the Regiment having formerly distinguished itself at both these places. The Royal Arms ornament the whole in a central circle.

**Rhos.**—Mr. Edward Evans, Brownwylfa, has presented a stained-glass window to Rhos church, in memory of one of his daughters, a Bishop of Llanercoy Hall, daughter of Mr. Evans has also placed two windows in the church in memory of her husband and an ant son. The windows have been designed by Mr. H. Walter Lonsdale, of London.

**Pimlico.**—A stained-glass window has recently been placed in All Saints' Church. The subject

represented is "Behold the Lamb of God." The window was designed and executed by Messrs. Heaton, Butler, & Bayne, Garrick-street, London.

#### Books.

*The Action of Lightning, and the Means of Defending Life and Property from its Effects.* By ARTHUR PARNELL, Major R.E. London: Crosby Lockwood & Co. 1882.

It is rarely the case that the reviewer cuts the pages of a volume which claims at his hands such respectful attention as does this little work, written by a field officer of our chief scientific corps. In method it is admirable; nor does the execution fall far short of the conception. As we do not feel prepared, however, to accept the practical outcome, we think it right, in the first instance, to express thus plainly and unmistakably our high estimate of the book. The outcome is so important, as regards the protection of public and other buildings from lightning, that we think it necessary to go into the subject with unusual detail. And in so doing it will be our aim to take our data from the work itself, and rather to invite the author to a reconsideration of that portion of his argument which we feel unable to follow, than to attempt any *ex cathedra* utterance on so vital a point.

Without attempting such an abstract of the theory of meteoric electricity as should give any excuse to the reader for not consulting the book itself, we must so far follow the excellent example set by the author as to define the terms we are about to use, in the exact sense in which they are employed by Major Parnell.

These two elements of electrical tension which correspond to the outer and inner coating of a Leyden jar, and the presence of which is an essential feature of the phenomena of lightning, are called respectively the collecting and condensing plates. The former term is applied to the element in direct connexion with the source of the electric disturbance; the latter represents the opposed or induced action. It is the theory of Major Parnell that the solid and liquid surfaces of our planet form the collecting plate of the terrestrial electricity, the atmosphere immediately surrounding the earth being the dielectric or insulating medium, and the under-surface of the clouds the condensing plate of the meteoric system. And with this view we concur, with one note that we have to add to the statement.

The explosive passage of electric force, whether from earth to sky or from sky to earth, is spoken of in "The Action of Lightning" as a thunderbolt. There can be no good objection to the use of the term, thus defined, so long as it is borne in mind that it is employed in a definite scientific sense, and not with the vague import of ordinary parlance. The gradual escape, or exchange of electricity, whether visible (as in the form of Aurora and St. Elmo's fire), or invisible, is called an electric leak.

"A terrestrial explosion, or thunderbolt, requires, therefore, for its formation two distinct agencies, viz.,—sufficient quantity and sufficient potential" (this term is used to denote tension). And it only occurs at a point on the earth's surface when the combined effect of the quantity and potential accumulated thereat, and of the reciprocal quantity and potential accumulated on the under-surface of the clouds, is powerful enough to overcome explosively the restraint of the intervening air" (p. 177). "The quantity originates with the charge from unknown causes acting from below, and the high potential is due to the condensing influence of the clouds. It is clear that the immediate cause of all discharge must be charge. It is, therefore, to charge, and to all circumstances that tend to collect it and to raise its potential, that we must first direct our attention in investigating the origin of thunder-bolts. Where lightning discharge is seen at the earth's surface, there, it is obvious, the charge must, just before, have existed. To put the same fact in another form, it is only at the spot where the charge that causes the lightning resides that the latter can possibly 'make earth.' This fact appears to have been constantly, almost systematically, lost sight of; but it must undoubtedly be at the root of all inquiry as to the action of lightning on the earth, and as to the best means of defending life and property from its effects."

With this, we, to some extent, agree, but think that it does not represent the whole truth. And it is in this slight difference that

the germ of our disagreement with the deductions drawn by Major Parnell from the foregoing paragraph lies.

We think it is left out of sight that, guided perhaps by that hydraulic analogy which is elsewhere so beautifully illustrated by the author (see p. 152), the terms above defined have rather a relative than an absolute significance. Whatever is unknown as to electric action, its duplex nature is admitted. Whether we call it anodal and kathodal, positive and negative, or attractive and repulsive, the fact is certain that the action of the electric power is not to be compared to that of a head of water, any more than it is to that of a boiler full of steam. With an action in one sense or direction is always present a corresponding action in the opposite sense. Thus each of the plates of the battery is in one sense collecting and in another condensing. Nor does there seem any good reason to doubt the fact that while the terrestrial surface may be charged with one kind of electricity from the sources internal to the planet, the cloud surface may be charged with the opposite kind of electricity from the upper stratum of the air, of which Major Parnell speaks as a reservoir of negative electricity. It is even possible that the same cause, as for example, the radiant power of the sun, may at the same time excite positive electricity on the earth, and negative in the clouds. All that we can certainly ascertain is the pressure and variation of potential, or of opposite states of tension. That the earth may be a main source, and so far as we are likely to be able to measure the main source, of this electricity, which it is the distinction of the present work so clearly to show, we fully admit. But this by no means excludes a corresponding action on the side of the clouds. Nor do we see any reason to deny that the predominating tension may be at one time terrestrial, and at another time atmospheric, or that, while in either case an induced tension is present in the opposite plate, the stronger tendency to force a discharge may be at one time from the positive, and at another time from the negative pole.

However this may be, there is no doubt of the reciprocal energy of the electric force, when it becomes manifested in the form of explosion. We have spent some time in vainly looking for an account that we have somewhere seen of the effect of the passage of a strong charge through a quire of paper, when the burr or projection of the sides of the hole was outward in both halves of the packet, the upper sheets being forced upward and the lower sheets downward, by the explosion. The notice, though thus unverified, will, at all events serve to explain our meaning; nor do we suppose that Major Parnell, though he has not given prominence to this view of the case, would be in any way disposed to contest it. Indeed, he says (p. 166), "The conclusion seems irresistible that, if there is any element of time in the case at all, the lightning spark leaves the two plates, the earth and the clouds, simultaneously, and coalesces halfway between; and this would result in an invariable upward direction of the stroke immediately above the surface of the ground."

The effect, however, of this slight difference in view is very serious. If we regard, with Major Parnell, the earth as the sole source of the electric disturbance, we may be able, as he suggests, to ascertain the channel which in any given locality, it would be likely to take, and to provide for its safe discharge. If the disturbances may act either from above or from below, such provision will be more difficult, as the point at which an electrically-charged cloud may approach the earth within striking distance is not easy to anticipate.

If this be so, theory, we think, as well as experience, is in favour of the view formerly advocated by Sir W. Snow Harris, as against that now supported by Major Parnell. The latter holds the view that the "stalks" or main bodies of lightning-conductors present so much greater sources of danger than the points present sources of safety, that their use should be abandoned. He would remove all metals from the exterior of buildings, on the ground that "exposed elevated metal is, as regards the action of lightning, a source of danger" (p. 271). On the same view he would prohibit the erection of clocks or bells in towers, and would substitute earthenware for metal in all spires, pinnacles, gutters, rainwater-pipes, and the like. He would avoid the use of iron floors, columns, and staircases,—of "masses of metal, e.g. safes, organs, and large mirrors inside a building in connexion



with the outer walls"; he would keep smaller metal surfaces, e.g. gas and water pipes, as far as possible from external walls, and would substitute "stout glass shields for the wire guards used to protect stained-glass windows." Here is an architectural revolution proposed, and one of such magnitude, that even if the theory on which it is based were unimpeachable, we think that there is very little chance that the recommendations would ever be carried into general use by the architect or by the builder.

For "the reduction of the explosiveness of the ground," Major Parnell considers it "advisable to build all constructions on thoroughly dry sites, and, where very practicable, on rocky ones." Paving is a further protection, from this point of view. Chimney grates are to be converted into "electric taps," by connecting "the grates by means of one or more iron bars to the ground below, and fixing on the grate a few short sharp iron spikes. In addition to this, a new form of lightning protector is proposed as a substitute for the lightning-rod in present use. The conditions laid down for this new form of apparatus are that it must be arranged so as to tap the ironed lying close around the building to be defended; that it must have no exposed stalk or elevated surface of metal; that it must be cheap to erect; and that it must not be liable after erection to any material source of failure. It is proposed to fulfil these conditions by the use of wrought-iron plates, 4 ft. long, 6 in. wide, and  $\frac{1}{2}$  in. thick, laid flat on the ground with the edge on one side touching the wall or vertically under the edge of the pavement kerb, at a depth of 6 in. below the surface, and placed end to end in contact with each other, each plate to have riveted in it two round wrought-iron vertical rods, each  $\frac{1}{2}$  in. in diameter, 12 in. long, and sharply pointed at the upper extremity." These points are to project 6 in. above the surface of the ground.

That an apparatus of this nature would be far more likely to cause inconvenience and to get out of order than an elevated rod leading by a wire rope to earth, we think there can be but little doubt. Further, as to the discharge of electricity by these points in the way of electric leak, this has to be borne in mind. The distances within which clouds charged with electricity (whether original or induced) approach the earth is often very small. The resistance of the air, as a dielectric, is in proportion to the square of the distance through which the spark has to travel. In the case of a lofty building the difference due to the height of its summit from the ground would often (it is, at all events, conceivable) suffice to make its wetted surface far more attractive, or far more certain as a leak, than an iron point on the surface of the ground. Thus, while on one view of the reciprocal and verging action of the collecting and conducting plates it would seem evident that the rod presents a far safer roadway for electric discharge than is offered by iron points 6 in. above the ground, we think that, even on the theory that the whole source of tension is terrestrial, and that the means of safety are to be sought in "electric taps," the higher the points of such taps are elevated from the ordinary level of the earth the more efficiently will they act as leaks.

We very much fear that Major Parnell will consider a commendation of his thoughtful work which dissects from his practical conclusion, to be like the play of "Hamlet" with the part of Hamlet omitted. But it will not do to allow the merit of the writer to blind us to what we cannot avoid regarding as the error of his advice. The subject is not one of slight importance. Mr. Anderson has told us ("Lightning Conductors," chap. iv.) how both "the untalented multitude and the bigoted zealots opposed in Europe, as they did in America, the establishment of lightning conductors"; and that "to the strength of these parties was unexpectedly added a third, in a not numerous but powerful section of learned literary men." In reviewing the able work of Mr. Anderson (which is included among the authorities cited by Major Parnell), we called attention to the graphic account of the erection of a lightning-rod on the Cathedral of Siena, and of the occurrence on the 18th of April, 1877, of a thunderstorm from which this appliance was, even in the opinion of the bigoted opponents of the method, the efficient protector of the church. Such a case as this, standing as it does at the head of a long list of like events, weighs far more with us, and we think should weigh far more with the scientific public, than the arguments of Major

Parnell. Our conclusion is almost a paradox, but we cannot hesitate to express the opinion that, while "The Action of Lightning" as a scientific work is one of an unusually high order of merit, its practical outcome is opposed to experience; and is not even a necessary consequence of the theory of the author if admitted without qualification.

*Transactions of the Brighton Health Congress, 1881.* President, BENJAMIN WARD RICHARDSON, M.D., LL.D., F.R.S. With authentic Portraits, Maps, and Illustrative Diagrams. Issued on behalf of the Building Fund of the Brighton School of Science and Art. London: E. Marlborough & Co.

This is a very useful as well as pleasant record of the recent Brighton Congress. It includes several addresses of value, and is illustrated with photographs of Dr. Richardson, Mr. Edwin Chadwick, and the energetic Mayor, Mr. W. H. Hallett, to whom so much of the success of the meeting must be attributed.

*Familiar Allusions: a Hand-book of Miscellaneous Information, including the Names of celebrated Statues, Paintings, Palaces, Country Seats, Ruins, Churches, Ships, Streets, Clubs, Natural Curiosities, and the like.* Begun (but left unfinished) by WILLIAM A. WHEELER; completed and edited by CHARLES G. WHEELER. London: Chatto & Windus, Piccadilly. 1882.

THERE are many names of very common occurrence in books, conversation, and newspapers which yet are not explained in dictionaries or gazetteers. The book before us is intended to supply such deficiencies, and is the work of American writers. Considering that it is intended to meet the wants of American as well as English readers and inquirers, it is very well done. We find the writer making a slip now and then,—as, for example, when under the heading "Cleopatra's Needle," he can only remember that it has recently been taken to New York and set up in the Central Park,—but this does not seem to occur often. Many will find the book useful.

## Miscellaneous.

**Dutch House-building.**—Life in Holland is much mitigated by moisture. The land is sand, but it is not for that reason dry as the desert, because, when a foundation of 3 ft. depth is dug for a house, it is filled with water in the course of a few hours, and a solid basis is obtained only by driving in piles very close together. The king's palace, in Amsterdam, though built of marble, rests on 70,000 wooden piles, and it is as square and true as if it stood on a stone bed. This is matter for wonderment, because everywhere, especially in the old cities, the houses are all awry in all sorts of ways; many of them lean over towards the street in the most threatening manner for the foot-passengers; while others, perhaps, lean the other way, with equal threatening to the navigators; for, if there is a carriage-road on one side of a house, there is sure to be a canal on the other, although often the canal, and the drive, and the avenue run together, and the housewife goes to a ship or boat to buy fish or potatoes, instead of going to a shop or having them gently delivered from the tradesmen's carts. The land is literally full of water, and, should the useful windmills cease to turn, it would become one vast swamp, and on the polder lands all life would soon be destroyed by consuming inundations. It is, nevertheless, true that the people enjoy good health, and might perhaps enjoy better health if they did with a little less smoking and drinking.—*Gardener's Magazine.*

**Naval and Submarine Engineering Exhibition.**—The judges for awarding prizes at the late Naval Exhibition held at the Agricultural Hall, viz., a prize of 100 guineas for the best means of saving life in cases of shipwreck; and a second prize of 50 guineas for the best invention of a humane character connected with seafaring, have given the 100-guinea prize to Mr. R. Roper, Stand No. 82, for his "Bridge Raft," as affording the readiest means seen by us, in case of shipwreck, of saving collectively a large number of persons, and supporting them above water for a lengthened period; and the 50 guinea prize to Messrs. J. & A. W. Birt, Stand No. 309, for their contrivances of cork mattresses, hammocks, cushions, seats, &c., for supporting individually persons in the water till further assistance can be rendered.

**Walthamstow Sewerage Works.**—Some three or four years ago the Local Board resolved to provide a proper system of main drainage, utilising the sewage on their farm, and in order to deal with the sewage easier and more profitably, it was designed that the surface or rain-water should pass by a separate system of sewers as direct as possible into the natural watercourses of the district, by these means rendering unnecessary the construction of large sewers, the extra size of which would only have been available in heavy rainfall. Three years ago the northern and main sewers were constructed under Mr. Girdle and Mr. Swan, but this did not complete the system, as, in order to prevent any pollution of the brooks from sewage, new branch drains had to be constructed, and where old sewers were found (nearly all of which were defective) new sewers have been laid for the conveyance of sewage, and the old drains used for conveying the storm-water. These works have recently been carried out. The length of sewers recently laid is more than six miles, and over 28,000 cubic yards of earth have been excavated. Junction pipes are laid at intervals of 30 ft. and 40 ft., so as to avoid any necessity of breaking the sewers to make connections. The works have been executed by Messrs. Carrall & Lewis, contractors, of Birmingham, under the direction and from the designs of the engineer to the Board, Mr. G. G. Jerram, A.-M. Inst. C.E. Messrs. Elder and G. H. Day have acted as clerks of works. The cost of these works has been 7,000*l.*

**Metal-work Fittings.**—Messrs. Tonks & Sons, of Macclesfield, Birmingham, have published a trade-book of their various brass and iron manufactures, containing 662 pages of illustrations, carefully executed. Turning over the leaves would show the public that there are many things they do not possess, but which are obtainable and seem desirable for comfort and convenience. Among the numerous articles are some very elaborate specimens of window copings and pole-ends, finger-plates, and so on. The new kind of picture-wires (Hookham & Ludlow's patent) seem reasonable as to price, also strong, more lasting, and less unsightly than cord in rooms. A new adjusting fastener is illustrated (Hookham's patent), which has not yet come into general use, merely because it is not sufficiently known. These are small loops of sheet copper in which the picture-rings are to be placed. In the ends of the loop are two holes through which the line is threaded, leaving 1½ in. free at the end. They are simple, appear to be secure, and admit of easy and nice adjustment. Six different sizes are shown. The "American" nippers are also extremely useful, giving three different gauges for wire, and can be used for opening champagne and other bottles where the corks are wired down. Many other useful as well as ornamental articles are illustrated.

**River Pollution: The Lea.**—The Local Conservancy has served notices on the St. Pancras and Islington authorities to abate the alleged pollution of a brook, a tributary of the Lea, which runs near the Finchley cemetery of these parishes. The brook in question was open, and a few years ago contained fish, which now it is an unquestionable nuisance for a considerable part of its course. The authorities at St. Pancras and Islington allege that it is polluted by the drainage of the township which it springs up at Finchley. The pollution of the Lea is also occasioned by the township of Leyton on the eastern side of the river, which has a large population. To meet the necessity of purifying the drainage into the River Lea, the local authorities propose to adopt the plan of the Rivers Purification Association, as in operation at Coventry and Hertford.

**Presentation to the Vicar of Luton.**—The completion, on Good Friday, of the twenty years' ministry of the Rev. J. O'Neill, as vicar of Luton, was marked, on Saturday last, by presentation to him of a handsome marble pulpit, costing some 250*l.*, which was subscribed by parishioners and others. The pulpit, which stands against the first southern pier in the nave, is in the Early English style, and is built of deeply-veined slate, and various kinds of marble. It is 6 ft. 9 in. high, and 4 ft. 7 in. broad. The pulpit came from the works of Messrs. Jones & Willis, London.

**Mr. George Atkinson, A.R.A.,** is read a paper on "Coloured Decorations" before the Architectural Association this (Friday) evening, the 5th.



**"Utilisation of Tidal Energy."**—At a meeting of the Society of Engineers, held on Monday evening last, in the Society's Hall, Victoria-street, Westminster, Mr. Jabez Church, president, in the chair, a paper was read on "The Utilisation of Tidal Energy," by Mr. Arthur Oates. The author commenced by stating that the recent advance in the application of electricity to the storage and transmission of mechanical power has caused attention to be directed to economising our coal, by the employment of some of the inexhaustible sources of power, amongst which the tide takes the first rank in this country. After giving a table showing the power and value of the energy derivable from the rise and fall of tides, and explaining how they can be calculated, the means which could be employed in utilising the energy were stated to be almost innumerable. Of these, the tidal dam is by far the most important, therefore the rest of the paper was devoted to the consideration of it, illustrated by drawings showing the nature of the proposed dam. It would have to be constructed across an inlet, or in any position where it would enclose a portion of the sea, and would be provided with machinery to utilise the fall of the water into, and out of, the inclosure, near the times of high and low water respectively.

**Temporary Buildings.**—At Bow-street, on Tuesday, Mr. J. O. Humphries, of Albert-gate, was summoned for alleged contraventions of the Metropolitan Buildings Act: first, for neglecting to give two days' notice to the District Surveyor before commencing to erect an iron building; and, secondly, for constructing a building without having obtained the approval of the Metropolitan Board of Works. The building in question had been erected on the Victoria Embankment, on a site adjoining the St. Stephen's Club, for the purpose of exhibiting a statue of the Right Hon. W. E. Gladstone, executed by Mr. Bruce Joy, and it was stated by Mr. Dr. Drury, the District Surveyor, that a compliance with the order was particularly asked for, on the ground that, being a place of public exhibition, there might be some accident through improper construction or otherwise, and the Board be held responsible by not insisting on a strict observance of the Act. Mr. Blanchard Wortner, who appeared on behalf of Mr. Joy, said this suggestion was improbable, and the exhibition was not a permanent one, and would shortly close. Mr. Vaughan, after some discussion, made an order with costs in the second summons, but adjourned the first for the attendance of the defendant, and for the purpose of considering whether it was necessary to give notice to the District Surveyor.

**Building Land at Acton and Ealing.**—Mr. Richard J. Collier, on the 20th ult., offered for sale at the Windmill Tavern, High-street, Acton, fifty-three plots of freehold building land, being the first portion of the South Acton Station estate, situate close to the Railway Station, from which there is a regular service of trains to Broad-street. The plots had frontages of about 3 ft. and depth of 100 ft., and realised from 55s. to 88s. per lot. The total result of the sale was 3,694l. On the 26th ult., at the Peathers Hotel, Broadway Railway Station, Ealing, the same auctioneer offered for sale sixty-six lots of freehold building land, having frontages to the Avenue-road and new road leading therefrom. At the beginning of the sale there was very poor attendance, and as lot after lot was put down to No. 8 had to be passed without a bid, it was evidently owing to the heavy building speculations, that no house of less value than 40l. net cost be erected upon these lots. Upon this being asked for No. 9, there was soon a price made. The restrictions being from this point down to lot 36 modified to 300s. per house, and active competition now set in, and a good sale was effected. Prices ranged from 66s. to 76s. for plots of 20 ft. frontage with depth of 100 ft. The lots were sold, realising a total of 3,475l.

**School Buildings Exhibition.**—An exhibition of plans and models for school buildings in this is now being organised by the French Minister of Public Instruction. Already 300 architects and contractors have notified their intention of exhibiting, and every province of France, including Corsica and Algeria, is to be represented. The exhibits are expected to be classified, owing to the various needs arising in different altitudes and climates. It has been decided to hold the exhibition in the wing of the Trocadéro Gallery, and the plans, models, and drawings must be delivered between May 1 and May 15.

**The Gulcher Electric Light System.**—A brilliant display of the new Gulcher electric light took place on Monday evening at the works of Messrs. A. Ransome & Co., King's-road, Chelsea, where a large party of gentlemen interested in the subject assembled to witness it. Mr. R. J. Gulcher, of Biola, Austria, the founder of the system, exhibited it at the Paris Exhibition, and his several patents will be worked by a limited company, now being formed for that purpose, under the style of the "Gulcher Electric Light and Power Company." The machinery and apparatus exhibited consisted of the dynamo machine and the lamp. The dynamo machine is constructed with a view to the production of an electric current of low tension and great power. To this end the internal resistance of the machine has been reduced to the utmost extent practicable. In this machine the armature revolves between the poles of four pairs of electro-magnets, and the periphery of the ring which it surrounds is also subjected to a powerful inductive action. The section of the ring is such that one of the principal sources of injurious heat is done away with.

**Leicester.**—The Abbey Park here is to be opened by the Prince and Princess of Wales on Whit Monday. Very extensive preparations are being made for the decoration of the town on the occasion, under the direction of Mr. Gordon, the borough surveyor. Besides Venetian masts, festoons, &c., there will be ten "triumphal arches." It is proposed that some of these shall be representations of the ancient gates of the town; 2,000l. is to be expended in these decorations.

**Wood Green.**—The tender of Mr. John Bell, contractor, Wood Green, has been accepted for building a large assembly-room at the King's Arms Hotel, Wood Green. Architect, Mr. Henry Stone, John-street, Bedford-row.

## TENDERS

For new roads and sewers, Beulah Park Estate, Norwood, for Messrs. A. Water & E. O. Davis. Mr. H. A. Alexander, surveyor.

Hornbury, Penrith, and Beulah Roads.

First portion.

J. B. Marshall	21,550 0 0
Wm. Harris	1,415 0 0
Pizzey	1,223 0 0
W. J. Botterill	1,163 0 0
Boyes	1,079 0 0
Clarson & Wilson	1,420 0 0
W. G. Harris	1,928 0 0
Wm. Nicholls	973 0 0
Wilkes & Co.	923 0 0

Granbrook, Westbrook, Upton, and Beulah Roads.

W. J. Botterill	21,532 0 0
Wm. Harris	1,399 0 0
Boyes	1,371 0 0
W. G. Harris	1,315 0 0
Pizzey	1,287 0 0
Clarson & Wilson	1,119 0 0
Wm. Nicholls	1,105 0 0
J. B. Marshall	1,099 0 0
Wilkes & Co.	993 0 0

For new Branch Dairies, stabling, men's apartments, and covered yard, in Wemyss-road, Blackheath Village, for the Express Dairy Company, Limited. Mr. Geo. Barnes Williams, architect. Quantities by Mr. Arthur T. Fulkers.

Cunder 24,393 0 0 || Collis & Son | 4,216 0 0 |
Ashby Bros.	4,165 0 0
Rider & Son	4,063 0 0
Ashby & Horner	4,019 0 0
Brass	3,826 0 0
Kirk & Randall	3,799 0 0
Jerrard	3,773 0 0
Adamson & Sons (accepted)	3,727 0 0

For the erection of six cottages and out-buildings at Great Thirlow, Sudbirk, for the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, & Weal, architects. Quantities supplied by Messrs. Nixon & Raven.

Bedding & Son, Cambridge 21,865 0 0 || Bell & Sons, Saffron Walden | 1,799 0 0 |
Grinnell & Son, Sudbury	1,693 0 0
T. Gudge, architect	1,669 0 0
W. Saint, Cambridge	1,588 0 0
Mason & Son, Haverhill (accepted)	1,579 0 0

For laying Limmer Rock asphalt at the Victoria Station Extension, Manchester, and Ordall-lane widening. Quantity, about 8 acres:—

Bradshaw & Co., London (accepted).

For laying footways of Black Boy-lane with Limmer Rock asphalt, for the Tottenham Local Board of Health. Mr. W. A. H. De Pape, engineer:—

Bradshaw & Co., London (accepted).

For alterations and adapting of premises, No. 10, St. James's-street, and No. 20, King-street, for the Junior Army and Navy Club. Mr. Wyatt Papworth, architect:—

Wm. Cole (accepted).

For alterations and new stabling at 149, Lancaster-road, Nottingham, for the London Parcels Delivery Company, Limited. Mr. W. Seckham Watkinson, architect:—

Scriven & Co. 4,729 0 0 || Coley | 897 0 0 |
| Vigor (accepted) | 637 0 0 |

For new Board School, Wolverhampton-road, Walsall for the Walsall School Board. Mr. Samuel Loxton, architect. Quantities supplied by the architect:—

J. Rowley, sen., Walsall	24,700 0 0
T. Taylor, Walsall	4,806 0 0
Stanton & Son, Oldbury	4,476 0 0
A. Lynex, Walsall	4,475 0 0
Brady & Co., Wolverhampton	4,385 0 0
Evans & Co., Wolverhampton	4,384 14 0
J. J. Wrol, Malvern	4,352 0 0
Atkins, Walsall	4,248 0 0
W. T. Bennett, Birmingham	4,234 0 0
W. Winstone, Walsall	4,231 0 0
G. Butler, Darlaston	4,085 0 0
S. Tece, Darlaston	4,071 0 0
G. Widdowson, Salley, Birmingham	4,010 0 0
J. Guest, Stourbridge	3,877 0 0
J. Jones & Son, Sedgely	3,793 0 0
J. H. Hunter, Walsall	3,770 0 0
Heap, Bros., Rugby	3,693 0 0
W. Willey, Wolverhampton	3,589 10 0

\* Accepted.

For new Board School, Elmora-green, Blorwich, for the Walsall School Board. Mr. Samuel Loxton, architect. Quantities supplied by the architect:—

J. Walsh, Hereford	22,789 0 0
Hughes, Halesley	2,690 0 0
W. Winstone, Blorwich	2,681 0 0
J. Rowley, sen., Walsall	2,551 0 0
W. Winstone, Walsall	2,497 0 0
T. Tidmarsh, Walsall	2,484 0 0
D. Moore, Walsall	2,310 0 0
T. & S. Crosswell, Walsall Wood	2,230 0 0
Bratley & Co., Wolverhampton	2,234 0 0
G. Widdowson, Salley	2,175 0 0
J. Jones & Son, Sedgely	2,161 0 0
T. & S. Dalton	2,145 0 0
H. J. Hunter, Walsall	2,110 0 0
H. ap. Rugby	2,049 0 0
Bromage, Leek	2,441 0 0
J. Guest, Stourbridge	2,009 0 0
G. Potter, Wolverhampton	1,998 10 0
A. Lynex, Walsall (accepted)	1,993 0 0

For houses and offices, at Fraborough, Kent. Mr. John M. Hooker, architect. Quantities by Mr. W. H. Barber:—

Leslett	22,197 0 0
Payne	2,180 0 0
Wheatley	2,155 0 0
Bingham	2,117 0 0
Wiltshire	2,110 0 0
Grout	2,084 0 0
Crosley	2,009 0 0
Calcutt & Son	1,981 0 0
Durnell	1,965 0 0

For villa residence, Blorwich, near Walsall, for Mr. J. Marshall. Mr. Samuel Loxton, architect. Quantities supplied by the architect:—

J. Beards, Blorwich	21,850 0 0
J. Rowley, sen., Walsall	1,790 0 0
S. Wootton, Blorwich	1,640 0 0
D. Evans, Wolverhampton	1,587 10 0
W. Winstone, Walsall	1,535 0 0
A. Lynex, Walsall	1,530 0 0
W. Willey, Wolverhampton	1,381 12 0
S. S. Tece, Darlaston (accepted)	1,350 0 0

For villa residence, Four Oaks, Sutton Coldfield, for Mr. Edwin Munrow. Mr. Samuel Loxton, architect. Quantities supplied by the architect:—

T. Hughes, Hoveley, Birmingham	21,700 0 0
J. Jurney, Aldridge	1,896 0 0
Sturges, Aston New Town	1,894 0 0
W. Winstone, Walsall	1,855 0 0
A. Lynex, Walsall	1,830 0 0
A. Lynex, Walsall (accepted)	1,431 0 0

For the erection of a residence and stable buildings, at Reigate. Mr. Alfred Burr, architect. Quantities supplied:—

Wm. Baguley	29,525 0 0
Malden & Harper	3,331 0 0
John Wilkinson	3,814 0 0
Albert Kimberley	7,574 0 0
Stephens & Bastow	7,466 0 0
James Longley	7,354 0 0
W. T. Beale	7,247 0 0
T. Pyrmann	7,214 0 0
R. G. Bailey	7,189 0 0
Priceley & Gurney	6,868 0 0
Wm. H. Wheeler	6,538 0 0

For house at Nether-lane, Finchley. Mr. T. Newell, architect. Quantities by Mr. S. Young:—

Flowerman, Finchley	23,774 0 0
Goodman, Barnsbury	1,989 0 0
Gibson, Mount all	1,967 0 0
Thos. New, Ealing	1,929 0 0
Staines & Son (accepted)	1,833 0 0

For alterations and additions to house, Gravel-hill, Bexley Heath for Mr. Thomas Westbrook. Mr. H. A. Alexander, architect:—

Sirickland & Co.	4,920 0 0
Elms	895 0 0
Gutts	778 10 0
Douling	768 0 0
Clarke	647 15 0

For block of four dwelling-houses, Tenner-street, Goodman's-Belds, for Mr. A. M. Rind, Messrs. Joseph & Pearson, architects. No quantities:—

Bayer	28,939 0 0
M. Lubian & Son	6,459 0 0
Langrad & Way	6,367 0 0

For making roads on the Heath House Estate, Romford, Essex. Mr. W. Houghton, surveyor:—

John Bell (accepted).

For building one-story shop on ground in rear of premises at corner of Nevill and Brough-on roads, Stoke Newington, for Mr. G. Morris. Mr. Lewcock, architect:—

Clark & Holden	2178 0 0
Taylor & Parfitt	139 0 0
J. Childs	144 0 0
S. Goodall (accepted)	130 0 0

For the construction of the works of sewerage and sewage disposal, for the Borough of Chipping Wycombe, Bucks. Mr. Baldin Latham, engineer:—

North & Parry, Seal rd.	£34,710 0
J. Moore & Sons, Blackfriars	23,010 2 3
George Low, Kidderminster	23,184 7 10
Laphin & Luntley, Gannessbury	21,854 0 0
Kellett & Bentley, Queen Victoria street	21,454 13 0
J. Strachan & Co., Wood-green	21,138 0 0
J. Simmons, Sidevale, Kent	20,265 10 6
Henry Sanders, Southampton	19,830 0 0
R. Hammond, Gannessbury	19,749 0 0
Ford & Everett, Westminster	18,663 3 1
B. Cooke & Co., Battersea	18,422 13 0
John Mackay, Hereford	18,000 0 0
J. Melland Smith, Westminster	17,772 0 0
Hill, Bros., Beckenham	17,772 13 11
Carroll & Lewis, Birmingham	17,281 4 4
A. Palmer, Birmingham	17,237 0 0
Bottoms Bros., Battersea	16,938 5 7
Fotherby & Son, Burnley	16,938 5 7

\* Accepted, subject to inquiry.

For alterations and additions to residence, "Gent-wicks," Cole-ester, for Mr. Edwin J. Saunders. Messrs. Ebbetts & Cobb, architects:—

Everett & Son	£115	£—
W. Pitt	458	70
F. Dupont	493	54
G. Dobson	418	51
C. H. Oldidge	444	50

B. Deduct of bricks and slates are provided.

For completion of a pair of semi-detached houses, at Silecup, for Messrs. G. H. Tatham and E. P. London. Messrs. Ebbetts & Cobb, architects:—

Carmody	£263 0 0
Olley & King	650 15 0
Langle & Pinkham	616 0 0
Baylis	588 10 0
Nichols	538 5 0

For alterations at the Malden Arms, Malden-road, for Mr. J. Hunt. Mr. J. R. Furniss, architect:—

Lamble (accepted)	£228 0 0
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For repairs, painting, &c., at the Lord Stanley, Pavement, Deptford, for New Westminster Brewery Company. Mr. H. W. Dodd, architect:—

Lamble (accepted)	£110 0 0
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For alterations at the Leight in Arms, Brecknock-road, for Mr. Bridgland. Mr. J. R. Furniss, architect:—

Tunst	£170 0 0
Asley	410 0 0
Dr-w	423 0 0
Lamble (accepted)	412 0 0

For two residences, at Barnet, for Mr. Charles Jack.

Mr. Edwin T. Hall, architect	£4,820 0 0
Emor & Dicksee, Rugby	4,502 0 0
Marnott Bros., Barnet (accepted)	4,473 0 0

For chapel to seat 204 persons (no galleries), in Arundale-road, Peckham. Mr. Edwin T. Hall, architect:—

Adams & Son, Putney (accepted)	£1,473 0 0
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For the first portion of proposed New Catholic Church of Our Lady and St. Philip, at Lower Sdenham, Kent. Mr. Fredk. A. Walters, architect. Quantities supplied:—

	A.	B.	C.
Tittmus	£2,150	£1,012	£120
Booth & Sons	2,445	1,010	610
F. Conder	1,995	1,010	500
Nash	1,995	912	480
Macey & Sons	1,995	912	480
Farnester	1,921	916	483
L. H. & R. Roberts	1,805	862	379
Deards	1,838	884	436

For the erection of twenty-seven houses, near Alfreton-road, Radford, for Alderman Burton. Mr. J. Martin, architect. Quantities not supplied:—

J. W. Russell, Nottingham	£6,638 0 0
James Saul & Son, Nottingham	5,290 0 0
G. Emerson, Nottingham	5,050 0 0
J. R. Morrison, Nottingham	4,745 0 0
Walter Collinson, Nottingham	4,620 0 0
Bot & Wright, Nottingham	3,335 0 0

\* Accepted.

For St. John's-road School, Hoxton:—

H. Hart	£15,467 0 0
G. R. Pritchard	15,421 0 0
W. G. Locke & Son	15,387 0 0
G. S. S. Williams & Son	15,304 0 0
C. W. Reading	15,273 0 0
J. Grover	15,215 0 0
E. Laurence	15,148 0 0
W. Brass	15,032 0 0
Steel, Bros.	15,332 0 0
C. C. Cox	15,318 0 0
Wall, Bros.	15,480 0 0
T. Boyce	15,460 0 0
Perry & Co.	15,110 0 0
W. Scrivener & Co.	15,293 0 0

For new farm buildings, stables, &c., for Mr. Kevil, near Maldon. Mr. Water Graves, architect. Quantities by Mr. H. E. Pollard:—

Nightingale	£254 0 0
Pollard	579 0 0
Spencer	558 0 0
Messon	767 0 0
Ackerman	776 10 0
Norman	693 0 0
Saunders	680 0 0

For alterations and additions to Lower Blagden, for Mr. C. Daw. Mr. Water Graves, architect. Quantities by Mr. H. E. Pollard:—

Pollard	£215 0 0
Nightingale	635 0 0
Nisbet	490 0 0
Spencer	462 0 0
Messon	415 0 0
Norman	410 0 0
Ackerman	374 10 0

For the erection of cottages in the Herbet-road, Wimbledon, for Mr. George Granham. Mr. Alfred G. Alley, architect:—

C. Bewsey (accepted)	£1,068 0 0
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For alterations to the Old Ford Mission-hall and British Workman, Tredegar-road, Bow. Messrs. Hills & Fletcher, architects:—

Gunning, Bromley, E. (accepted)	£300 0 0
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#### TO CORRESPONDENTS.

No notice will be given in the outer wall would be found useful. But get address on the spot) — B (see us not pretend to advise in general cases. General notice may be found in our page 1. E. P. (ingly) — subscriber (We cannot give to address. The sign will be given to have it out of use) — J. L. B. — H. R. T. W. F. H. — N. & R. W. C. — W. G. — J. — H. — F. — A. — B. — A. — Master Builder — M. & Co. — J. C. — J. H. — T. G. — S. — R. — A. — L. — R. & H. — C. — A. — W. H. — R. — G. — D. — F. — H. — R. — S. — A. — W. — J. — B. — D. — B. — R. — L. — H. — A. — S. — R. — N. — S. — W. — S. — W. — L. — A. — W. — J. — P. — R. — W. — F. — D. — A. — H. — F. — B. — J. — M. — J. — P. — R. — W. — C. — R. — L. — R. — C. — R. — T. — H. — W. — H. — R. — D. — M. — L. — A. — G. — A. — O. — H. — F. — M. — B. — C. — W. — B. — F. — L.

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# The Builder.

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SATURDAY, MAY 13, 1882.

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### The Archaic Greek Vase Room in the British Museum.



THE two large rooms in the British Museum, placed on the upper floor at the north-west corner of the building, immediately over the Egyptian Gallery, have been, for many years past, dedicated to the arts and sciences of Egypt, but on the transferring of the Palaeontological collections to the new British Museum of Natural History at South Kensington, the relics of the land of the Nile were removed, as those who remember who read the recent article upon the New Egyptian rooms in our columns, to the rooms then vacated. In succeeding turn, the old Egyptian rooms, which were bounded in a southern direction by the two Vase rooms, have given an opportunity of arranging the artistic remains of ancient Greece in four rooms instead of two as heretofore. Of this great advantage, Mr. Newton, C.B., under whose charge the ancient vases and terra-cottas of the British Museum are preserved, was not slow to avail himself, with the result of forming a long continuous gallery of four large rooms, of excellent proportions, and lighted from their roofs, in which he has just achieved the scientific and chronological arrangement of the most magnificent specimens of the ancient potter's art that any museum has ever been enabled to display. Entering the first room, after ascending the staircase at the further end of the Egyptian Gallery, the visitor is enabled to inspect the whole collection of pottery,—archaic, transitional, finest, and latest,—as he passes from the first room to the fourth on his way to the friezes and the glass which are contained in rooms farther to the south.

We propose on this occasion to take a cursive glance at the contents of the first or Archaic room, pointing out, as we proceed, the principal objects likely to claim the attention of the visitor or student, but it must be only a cursive glance, for many volumes of profound learning have been, and might be, written in elucidation of these valuable remains of a primeval art, which, passing in progress of time into other phases, is now in itself as completely lost to us as are the arts of building a Gothic cathedral or illuminating a page of vellum. The series of

archaic and other vases have been principally obtained for the Museum from the following sources. The vases which were collected by Sir William Hamilton when he was British Envoy at Naples, were purchased in 1772, and form the nucleus of the collection in the Museum, to which a few were added by the purchase of the Towneley Antiquities in 1814, that of Lord Elgin's antiquities in 1816, and the bequest of Mr. R. Payne Knight in 1824. In 1836 a number of fine vases were purchased at the sale of the celebrated collection of the Chev. E. Durand, and again, in the following year, at the sale of the Prince of Canino's vases. In 1843 a hundred selected vases, principally from Vulci in Etruria, were purchased from the Princess di Canino, and by these three purchases, the Museum collection, up to that time very deficient in fine specimens from Vulci and Nola, —sites dear to vase collectors, in more senses than one,—was greatly enriched. The most remarkable accessions which have taken place since this period are the vases from Athens and the Greek islands, purchased from Mr. Thomas Burgon in 1842; those from Kameiros, Kamiros, or Camirus (for the labels to the vases are somewhat lax in uniformity of spelling), a site in the island of Rhodes, purchased from Messrs. Salzman and Biliotti in the years 1859 to 1864; those from the sale of the Pourtales Antiquities in 1865, the great Blacas collection in 1866, and the Castellani collection in 1873. The collection found by General L. F. di Cesnola during his extensive excavations,—we may almost say, his subterranean ransack of Cyprus,—and those acquired by Mr. R. H. Lang from that island, contributed several valuable specimens to the archaic classes. Nearly all the vases in the Museum, we are told, come from tombs in Italy, Sicily, Athens, Corinth, the Greek islands, including, pre-eminently Rhodes and Cyprus, and the Cyrenaica.

It is curious to observe that, just as in Egypt the custom of depositing domestic and artistic objects with the dead in tombs and graves has enabled us, in a great measure, to reconstruct in idea the surroundings of a Nilotic home, so these vases, although they are found in tombs, and are associated in locality and in surroundings with the dead, are probably, for the most part, very similar in form and fabric to the stolid earthenware which was commonly used in the ancient Greek household. The same feeling may be observed, though in a far less degree, in some of our cemeteries to-day, where a cup or a wineglass holding flowers is placed upon the grave of one of the humbler members of the departed throng. If these vases were not actually, they were at least capable of being, employed, every one of them, for a variety of domestic purposes, and no one can examine, for instance, the long funnel in Case 8-9, or the jug with a human head for a spout, having a perforated chin for a strainer, in Case 32, without being compelled to admit the evidently utilitarian forms of these sepulchral embellishments. In most cases the shape of the vessel

clearly indicates its original use, and the shapes of jars, jugs, ewers, basins, drinking-vessels, bottles, pots, strainers, kettles, and bowls, were as diversified among the Greeks as they are now among modern European communities.

The first cases in the new room, numbered from 1 to 13, on the left-hand side, contain a selection of archaic vases from the tombs discovered at Ialyas, in the island of Rhodes. The subjects on these vases consist of such simple and primitive designs as meanders, stars, lozenges, waves, chequers, and other ornaments, arranged in concentric bands, apparently in imitation of woven fabrics. Cases 1 and 2 comprise the earliest self-coloured terra cotta, of a light yellowish-brown body, painted with a dark neutral brown, frequently approaching to black, after being formed with the help of a potter's wheel out of a lump of moist clay, and subsequently baked in a furnace. Some of the examples in these cases have bands of parallel lines, geometric patterns, and designs resembling simple flowers. In others a figure occurs which has been considered by some to bear resemblance to the cuttlefish, a common object, no doubt, to the inhabitants of the Greek littoral. If this be really so, we have preserved to us in these rude but ornamental designs evidences of the earliest observations of natural forms, in which a marked symmetry is displayed by the progenitors of a race whose later developments of the arts still enthrall the world, holding them spell-bound under influences which will be potent for many a future century. With all our scientific progress it is difficult to imagine a period when Greek art,—of which we see the *incunabula* in these primitive vases,—will cease to attract the attention, or to claim the admiration, of the world. In others an aquatic plant is depicted. These have either two or three handles, and their forms are as various as the uses to which they may have been placed.

Cases 3 and 4 contain examples of the *pyxis*, cups, bottles, saucers, and small vessels, many of which were presented by Professor John Ruskin in 1872. On these we may observe a marked progress of design, and a greater elaboration of form, than we have seen. The devices of this category include zigzags, spirals, fishes, and birds not unlike swans. In the same case are some fragments of early pottery from Mycenae; but the Museum is not very well represented by Mycenaean remains as yet. A very remarkable kind of ware in these cases consists of bowls and tripods, which are perforated with numerous small orifices, as though intended to be used for straining away some liquid substance, the outside surface of this pottery being studded thickly with test-like projections. These shapes, like many others made in the archaic period, are peculiar to the style, and do not recur in the later periods of stolid art. Case 5 contains specimens on which are rude horsemen or warriors; and in the next case are some fine large vases adorned with plant-like devices. The seventh case comprises, among other interesting forms, the winecup with funnel-



shaped bowl, long narrow stem, with two small handles on the rim and the cuttlefish pattern to which we have already drawn attention. Some of the shape termed *oinochos*, or decanter for wine, have a series of conical shells, embellished with a profusion of small dark spots depicted upon them; another example which, when considered in connexion with the aquatic plants, the cuttlefish, the wavy or zigzag line, the fish, and water-birds, points in an abundantly evident manner to the absorbing influence of the sea upon the feeling of the insular and maritime people of whose art-beginnings these are the priceless relics. A succeeding case shows another *oinochos* with a cuttlefish painted on it,—a long vessel, with elaborate zigzags,—and a conical funnel, with elaborate zigzags, and a vase enriched with wavy lines and rosettes. Cases 10-13 illustrate a further progress of the primitive principles which were influencing the nascent arts of Greece. We have here other specimens of the *oinochos*, enriched upon its surfaces with a water-plant, or with a pattern of spirals; a tripod vase with a loop-shaped handle; a vase with an ornament resembling an ancient shield; and others with zigzags, scales, and a peculiar pavonaceous pattern of overlapping laminae, which may be compared with the Saxon methods of depicting scale-armour or a shingled roof, or with the later kind of armorial field for a shield of arms, called *papelonné*, which occasionally occurs in British as well as in foreign heraldry, and is evidently derived from and suggested by the overlapping of bird's feathers or fish-scales. The necropolis of Ialysos, which has yielded up all these vessels, also contributes two large *pithoi*, or oak-jars, placed on the floor of the left-hand side of the room, having flat-banded handles, and their bodies carved in relief with floral patterns, spirals, and geometrical tracery.

Cases 14-19 are devoted to the archaic Athenian pottery, which Mr. Newton attributes to a period between 700 and 500 B.C. Included in this section is the celebrated large *lebes*, or bowl, which seems to be a specimen of a more advanced period of ceramography, when animal forms became the principal object in a design, instead of being a mere accessory. This vase was discovered at Athens in a tomb by the late Mr. T. Burgon. It is figured in Dr. Birch's "History of Ancient Pottery," p. 184. The ground is of a pale fawn, the figures of a light maroon colour. The subject is two lions of large proportions, standing face to face, each with a fore-paw held out over a flower; their tongues lolling out of their mouths, and their tails curved between the legs. All round them are rude geometrical patterns, which, according to Mr. Newton, seem to be a primitive attempt to represent a field studded with flowers as a background to the lions. On the other hand, Dr. Birch, in his work already mentioned, considers that the field is strewn, not with flowers, but with meanders, chequers, spirals, and other ornaments which appear in the former style. The border above is irregular, consisting of dentils, the egg-and-tongue ornament,—its first appearance in art,—and the wave pattern. Other specimens on these shelves show forms of the lion and gazelle painted on them, and their own shapes and sizes exhibit a great variety, and show great improvement in technical processes. Athens, hereafter to become one of the most renowned vase-producing localities, is further represented at this archaic era by cases 20 and 21, which contain a miscellaneous display of many remarkable vessels, demonstrating the versatility to which the fictile art of the potter was subservient from a very early period. Here we may notice *hydria*, or water-jugs, smaller jugs and cups, *aryballi* or fancy oil-bottles of bizarre shapes, *oinochos*, or wine-jugs, mugs, a child's toy chariot, of which the wheels are constructed to revolve, and some lids with handles in the shape of horses or other quadrupeds. On most of these are painted birds, meanders, geometrical patterns of more or less intricacy, wavy lines, and such simple embellishments as the workmen could produce with ease and rapidity while the clay was in a state fit to receive the colour. It is worth while observing that the bands of ornament on Athenian vases, and some others allied from Kameiros, which we shall allude to presently, are frequently divided into equal spaces by parallel vertical lines, alternating with square or rectangular compartments, which serve as frames, within each of which a geometrical ornament, flower, or animal is painted. This alternate arrangement of vertical lines and pictures in compartments is thought by Mr. Newton to be very analogous

to the metopes and triglyphs of a Doric temple, from which the idea may have been borrowed.

In the next series of cases, numbered 22-33, are deposited the archaic wares of the island of Cyprus, cases 22-26 containing a very large number of vases of various shapes and sizes. Some of these have spouts; others, with nipple-shaped tubes projecting from the body, are the so-called *telines*; but whether they took the place of the modern infant's feeding-bottle, or were employed as lamp-feeders or sprinklers, has not yet been determined. We may, however, presume that the artificial nourishing of young children was occasionally resorted to, and these vessels appear to be remarkably well adapted to the prosecution of that process. Other vessels on these shelves have an indented edging or border. Cases 24 and 25 are occupied by some charming and elegant vessels, which strike the eye forcibly, of small dimensions, but covered with a pale, creamy-white, lustrous glaze, very unlike the surfaces of other vessels which are placed in proximity to them. There is also a stand or candelabrum in case 25, with a square foot, and having small models of birds and cups upon it. It may be compared with some Etruscan stands which it resembles. Case 27 and the corresponding case, 38, at the opposite corner of the room, is filled with several very capacious amphoræ or urns, of sepulchral use, enriched with geometrical devices on the shoulder and round the neck. Many such vases have been found in the island, and the collections found by General di Cesnola, now at New York, and by Major di Cesnola, F.R.S., at Holland Park, Bayswater, comprise several of the largest size and most elaborate adornment. One of the Museum specimens in case 38 is painted with the *fyfot*, a mystical emblem seen also on the *lebes* already described. A recent writer has endeavoured to elucidate the mystery which attaches to this symbol, explaining it as a representation of Indian lightning, and connecting it with the four quarters of the compass. May not this be seeking to attach too recondite a significance for what may, after all, be a mere variety of a cross or four-pointed star? We incline, however, ourselves to consider it a sun-symbol, as we have elsewhere pointed out.

Continuing our progress round this most instructive display, succeeding cases exhibit to the attentive visitor (and we may here remark, by way of parenthesis, that the proportion of visitors to the Museum whose eyes were that dreamy, half-bewildered, half-undecided gaze of inappreciation, is far less than of those who appear to enjoy an intellectual understanding of the contents of the national collections) vases and fictile objects, adorned with flowers and geometric patterns; interlacing lines, perhaps suggested to the artist by basketwork or the products of the loom; annular bands, and disks or sets of concentric circles, with a central spot of colour. One of these, of ovoid contour, has the neck finished off with a modelling of a female head, with long hair in curled ringlets, and with rows of tiny circular wafers or roundels in terra-cotta, to represent silver or gold plates, round the forehead and temples, and round the neck. From the middle of the body of this vessel, there protrudes a spout or tube, furnished with a small orifice sufficiently wide to allow of the escape of a thin stream of liquid at the will of the holder. Another, of globular body and capacious handle, has the lip of the neck modelled in the form of a human head or face, the chin being of somewhat exaggerated proportions, and perforated with a large number of minute holes, so that the contents of the jug could be poured forth after the manner of a modern watering-can. Some of the specimens in case 32 are in form and general appearance akin to the Italian styles. Crossing over to the other side of the room, case 33 contains specimens of plain red glazed ware, many of which resemble the oldest Egyptian pottery as to form, while as to material and appearance they may well be considered proto-Samian, or the forerunners of that eminently useful pottery, the Samian, in after ages. In case 36 a miscellaneous collection of small vases has been assembled, which will be familiar to those who have read General di Cesnola's work or who have seen the album which has resulted from the excavations of Major di Cesnola at Salamis.

The account of Cypriote fictilia must yield now to that of the archaic pottery from various sites in Italy, here preserved in cases 39-51. Much of it is of the class styled Corinthian,

various forms of *lecythi*, or jugs, with wide or narrow necks, and fat circular bases, the principal designs upon the body being lions, birds, spirals, flowers, and wandering lines of elegant beauty. In case 41 is a toy-horse, with figures of man, and of several animals. In the next compartment a very remarkable vase, in form of a siren, and a relic which takes the form of a female seated, and wearing the long curled hair which has been already referred to. Other models of woman, with coloured drapery, cups with gorgons' heads, sirens, and similar representations, abound in this section, and with them are many of the kind known as *aryballi*. Cases 44 and 45 continue the *aryballi*, with cups of pear-shape with spreading lip, like flower-bells, models of birds, ducks, and jacksals, or long-eared animals of a cognate kind. One of these fancy vases takes the form of a man carrying a vase, a conceit perhaps by Egyptian prototypes. The next group of cases, 46-54, contains, among many of a most interesting character, an amphora with the design of a chariot driven by a charioteer, and carrying a warrior in the act of drawing his bow; the lizard and the owl placed in the field perhaps represent the nature of the country through which the chariot is passing, in the same way as we have seen at an earlier period a few simple flowers sprinkled over the background represents the nature of the haunt of lions, as portrayed on the Athenian *lebes*. With this design may be compared the chariot scenes sculptured upon Assyrian friezes. A combat of warriors on a vase in this section is rendered more vivid by the painting of a few red droplets of gore upon the thigh of one of them, the colour being but little or nothing changed now from that which was first added to the picture more than 2,000 years ago. Some of the vessels in these cases have lids, and are supplied with two handles; they are the honey-jars or preserve-pots of the ancient Greek household, and of the type known as *stamnoi* on them are painted lions and other denizens of the Grecian wilderness, or the fantastic creations of an artist's imagination, set in fields or backgrounds replenished with quatrefoils and foliage. On one vase is inscribed an inscription of a date so much later, palmographically speaking, than the style of the pottery would seem to indicate, that we are driven to admit one or other of the following theories: either that the manufacture of archaic ware survived to a comparatively late period and flourished contemporaneously with vastly different and more advanced styles (just as Staffordshire to-day manufactures rude types of pottery which have survived from the earliest ages of England's history); or that the actual period of archaic ware is, for some localities at least, to be attributed to less remote ages than has usually been conceded to it. The amphoræ in this section show upon their bodies elegant forms of birds; male figures engaged in running or other games; the hunting of the hare, a dog chasing a hare, and other sports; balls; and, curiously enough, one of these vessels is adorned with a scale pattern, and having a cuttlefish on the neck, seems to recall the devices we have already observed upon the earliest Rhodian pottery from the necropolis of Ialysos. Case 51 contains an unglazed *oinochos* from Cyprus, with the scene of a chariot, charioteer, and bowman of a rude type, and apparently but a distant cognate to the more advanced glazed vessels in whose company it is arranged.

Kameiros, another Rhodian site, has surrendered to the explorers of her many tombs the most valuable results. Two of her finest relics are contained in case 55: they are of the shape termed *oinochos*, and the subjects are arranged in rows or friezes placed one above another. The composition of these subjects consists of animals, huntsmen, floral patterns, and so forth. Cases 56-60 complete the circuit of this room, the contents of which it would, indeed, be difficult to match anywhere. In case 56 the most notable object is an *oinochos*, with two harpies or human-headed birds, an amphora with horsemen painted in red upon a light red ground, and other specimens of the style, are in the same case. In 53 are some small and delicate *aryballi* in form of heads, and a vase in shape of a containing or circle, with lipped mouth and ring-handle. The amphora in 59 seems to present a still further development of the archaic style. The entire side of belts of geometrical patterns, the entire vase, from the neck nearly to the foot, is encircled by a series of bands or friezes, in two of which the human figure, attenuated like the bronze figures of Etruria or Assyria, is intro-



duced; but the drawing is still of the most untutored kind. Purple and white colours are combined with the primitive brown, and in several of the animals the eyes and other features are expressed by lines rudely incised in the clay while it was yet in a moist condition. These animals and men take the forms of huntsmen, centaurs, or androtaic forms, such as the mythological fancies of ancient Greece loved to dwell upon, deer, and birds. On the neck may be noticed a remarkable attempt to introduce a novel technical process, for two figures, instead of being painted in brown on the pale ground supplied by the natural colour of the substance of the vase, are painted in white on a crimson ground.

Having now made the complete circuit of the room, and pointed out the principal characteristics of the antiquities preserved in the wall-cases, it remains only to touch upon the standing-cases, in the centre of the room. On the right-hand side, as one enters, is a case containing a most interesting specimen of the second class of Kameiros pottery, viz.,—that in which crimson and white are combined with brown in the painting, and in which animal forms are freely introduced, sometimes in subordination to the geometrical ornaments, but more generally as the main elements of the composition. It is a terra-cotta coffin or sarcophagus, without a lid, and having round its margin a design very similar to that of the flat circular *pinakes*, or plates, which Mr. Newton has placed around it. The use of terra-cotta for coffins or places of depositing the dead seems to have been widely spread over the ancient world; and, indeed, it may be looked upon merely as correlative with the very general custom of placing the ashes of cremated body in an urn. Numerous ashes, of slipper shape, and made of glazed ware, have been found, piled one upon another to the height of 45 ft., at Warka, the ancient Ur of the Chaldees, as described in Dr. Birch's "History"; and in our recent notice of the Etruscan Room at the British Museum we drew attention to the use of terra-cotta sarcophagi among that people. At the head of this coffin is a bull standing between two lions in a field replenished with flowers. At the foot are two other lions, back to back, in a similarly decorated field. The sides of this unique relic of Greek art are decorated with a twist or plait, forming a series of spirals, fringed on each side with flowers, and between this border and the head of the coffin a helmeted and bearded head is rudely drawn on each side. These heads are curious as being very early representations of the human features. The plates ranged round it in the case are fine examples of the same style; on them are bulls, dogs, a sphinx of primitive drawing, a gorgon's head, and various flowers. One of these *pinakes* calls for especial note as an advanced specimen. On it is a combat between Menelaos and Hector over the wounded Euphorbos, the three Homeric heroes being distinguished by the names inscribed over them in archaic Greek letters. This Euphorbos Pythagoras claimed to have once been, and he declared that he recognised the hero's shield which was suspended in his time in a Greek temple. The fragment of a terra-cotta pithos with a sphinx in relief, and several small *aryballi* in form of men and animals, and one beautifully moulded in form of a cockle-shell, claim our notice. Beneath this case are some inscribed cups and also specimens of the *kyrnos* or cluster of little vessels upon a circular stand, the use for which has been variously assigned by writers. Another table-case on this side of the room has a series of terra-cotta figures and figurines, some of which are archaic representations of the female figure, and intended to represent *Venus* or *Aphrodite*, whose cult was universally affected by the orthodox inhabitants of Greece and her Hellenic colonies. In this table-case are many Egyptian figures of porcelain of the date of the twenty-sixth Egyptian dynasty, amongst others, a scarabæus with the pronomen of *Panmut*, thus I., B.C. 650, giving a synchronism to the vases and other objects found with it. Crossing over to the other side of the room, between the massive *pithoi* already described, are two cases which contain the later vases in the archaic style. These come next in order of time to those with which we have hitherto been occupied, but by a long interval of time. Here the design is painted in black, on a red ground, the outer and inner markings being scratched or incised into the surface of the pottery. The red ground or tablet in these cases no longer covers the whole surface of the

vessel, but is confined to a compartment placed between the handles, and occupying about a third of the whole side of the vase, bounded by a border of geometrical ornaments,—the relics of an archaic style which is rapidly passing away from the pottery under the more comprehensive feeling for art which is beginning to assert its mastery over the mind of the workman,—and the rest of the vase, or the background proper, is painted with a lustrous black varnish, far more durable than that used in the earlier examples of this class. The field is still besprinkled with flowers, and friezes with animals still occur; but these more archaic characteristics are gradually dropping off, and the representation of the human figure in action becomes the principal object in the picture. As greater mastery in delineating the human figure is acquired, so as we pass down the series more complicated groups are attempted and a greater number of figures introduced, but foreshortening and perspective are still absent from these early pictures. The subjects represented are generally the myths of the Homeric poems or the epic cycle, hunting scenes, and games of the athletes. The flesh of the female figures is white, and the field is clear, to represent the atmosphere, or symbols are introduced to indicate locality, such as a dolphin to represent water, a flower or a tree for vegetation, much in the same way as a sun or moon, flowers or stars, in Mediæval glass painting or seals, are accessories of time or locality.

#### ON THE THEORY OF ELEVATIONS: AS FRONT, FLANK, OR REAR.

In a previous article (see p. 409, *ante*) it was assumed as admitted, it now appears somewhat prematurely, that the triglyph of Greek Doric architecture was a transcript in marble from the simple end of a beam as exposed in earlier forms of carpentry-construction,—of a beam resting horizontally upon another beam, either as wallplate or as an architrave spanning an interval, whether of doorway or from column to column of a portico. A theory propounded by Mr. Fergusson in the very next number of the *Builder* makes it necessary to recur to this assumption; to leave a theory so ingenious in itself, and so forcibly vindicated, to harass our own theory at the rear, would be imprudent. The derivation of triglyph and metopes, which is illustrated in the woodcut (p. 114), is certainly possible; such it may have been; but when we make "it may have been" our starting-point, we have to pause upon several intermediate stages before we can take post beside the sanguine theorist with full satisfaction upon his station of "most have been." It is a very long stage to begin with, from "it may possibly have been" to "it may very probably have been," and thence again to "it may most probably have been." The protuberance of a truss certainly affords a ready suggestion for the combined grooves of a triglyph; but the explanation of this ornamental treatment is surely not so difficult of solution as to necessitate resort to one which involves very serious difficulties. The simple squared beam,—squared though it might be only by the adze,—is a simpler element of construction than a combination of planks, which demand serious expenditure of labour to form them in the first instance, and then to fasten them together with absolute firmness. On the other hand, no very remote motive need be inquired after for cutting off the sharp angles of the end of the beam on either side; if any other suggestion for the intermediate grooves is demanded beyond a sense that they would give pleasing expression to the reception of downpieces, it is not far to seek; such grooves, by traversing the circular rings of the grain of the wood, would facilitate the descent of moisture, would expose a greater surface for its readier evaporation, and tend to prevent splitting.

As regards the antiquity of the truss in Greek architecture, which has been called in question by Professor Roger Smith, an answer may be given from Homer, if Homer, in the uncertainty as to his age, will be accepted as ancient enough. At the funeral games in honour of Patroclus, Ajax and Ulysses come forward to contend for the prize in wrestling; there are groups on the Greek painted vases which exhibit wrestlers who have taken grip, and are leaning towards each other in precisely the manner that sug-

gested the Homeric simile, which, literally translated, runs thus:—

"And the pair having circled themselves went into the mid assembly,  
And with their stalwart arms they took hold, clasping each other;  
Even as rafters might be, which a workman renew'd has fitted  
For a lofty mansion, with caution against the force of tempests.  
Then creek'd their very backs as they by their arms so stalwart  
Were firmly and forcibly strain'd; and the sweat pour'd copious down them;" &c.

The image here intended to be suggested by the inclined bodies and tight grip below of the athletes can only be that of a pair of rafters firmly connected by a tie-beam. Homer, in fact, who, in his definition of the circular shield as "equal in every direction," coincides with the mathematical definition of the simplest of the conic sections, betrays here his practical recognition of the theorem, so important in timber work, from a scaffold to a masonry, that so long as the three sides of a triangle are rigid, the angles are immutable, and stability is in consequence secure. It is a fair conjecture that the frequent Homeric epithet for a stately mansion,—"high-roofed,"—refers not to general loftiness of the structure, but to the contrast to an ordinary flat roof, of a roof of a certain pitch,—a trussed roof.

But turn we now to resume and pursue somewhat further the topic of architectural style in relation to architectural proportion. Recurring to our Doric example, we observe that it illustrates in the most forcible manner the value of the simplest application of proportion in bilateral symmetry,—an application which otherwise is susceptible of great variety with corresponding variety of expression and effect. A vertical line through the apex of a Doric pediment divides the façade into halves, similar and correlative, each when taken alone manifestly mutilated and incomplete. This is the only line which will divide the composition into such correlative sections, and it is on this fact that the expression of organic unity depends. The greatest symmetrical definition is given by the opposed raking lines of the pediment, by the lateral projections of cornice and steps, the terminal treatment of the frieze, and in some degree by the closer spacing of the columns by the angle.

It is a matter to be decided by the architect's sense of proportion and fitness, in compositions which include a greater variety of parts, how far certain subordinate irregularities may be admitted as too insignificant to impair in any degree the predominance of a main symmetry,—nay, how far the introduction of subordinate variations may not give additional effect to that predominance, while adding enrichment to the general composition. But it is evident that when irregularities so far predominate that symmetry on any scheme becomes undiscoverable, composition which is something more than simple collocation ceases to be a matter in question.

Such absolute irregularity in one direction is not more alien to artistic composition than in an opposite extreme, is bald and absolute uniformity. A square block may be cut down the centre into two corresponding halves, but it may be cut into three or indeed any greater number of parts all similar and interchangeable; there is no artistic expression of unity in a mere range of warehouses or a cotton-mill, which might be extended by repetition in either direction with no disturbance of composition, or shortened at either end at will as indifferently. The only alleviation of vague uniformity which can in some such cases be employed successfully, is to be found in the general relation of length of such a line of building to its height being limited by some definite and very simple proportion. By employment of this artifice, which will tell insensibly and not the more effectively because not declaring itself distinctly to the observer, a range of uniform parts may receive a certain bond of unity, and thus be admissible in positions,—most especially on the side of an important building, where very emphatic marking of a centre would in truth be inappropriate. We may usually find ourselves more content when such a resource has been relied on, than when trivial or exaggerated attempts have been resorted to, to mark at least the terminal sections. There are those who have found that the uniformity of the interior of King's College Chapel, Cambridge, from end to end, was too suggestive of a passage which need not end where it does, and might, for any propriety that



appears, have begun at any distance; who have complained that it unrolls like a ribbon,—beautiful, doubtless,—but a ribbon still. The critic is not more indulgent when he takes us round the exterior; he refuses to admit that a few heraldic emblems attached to the four eastern of the eleven uniform buttresses, do more than betray an afterthought that some differentiation would be appropriate, and utter feebleness in an attempt to supply it. King's College presents twelve windows on the flank, and thus a central division falls upon the line of an intermediate buttress; this so far appears in accordance with what is appropriately expressive of the side of a building as a side; the bisection upon a feature so important as a window,—even a window of a uniform series,—would be a trespass upon the prerogative of a proper front. It is by observance of a distinction of this kind among others that the importance of a front is maintained. For the same reason we may question the propriety of distinguishing a central group of windows on the flank of a club-house, while such treatment may be perfectly in place at the rear, where it is accepted as a natural consequence of axial distribution,—as the dying out of a distribution that would be still more positively pronounced in front.

What shall we say, then,—to adhere to the sound principle of adding a concrete example,—of the Banqueting House, Whitehall? Does it address us as the front, the flank, or the back of a dignified building? We know, indeed, that it is but a fragment of a larger composition, but, nevertheless, as it stands it has a marked individuality, and claims to be appreciated on its own account. It is constantly regarded, but cannot be accepted critically, as a true front. A building does not seem to face us full front unless, according to the analogy of the human face, the central vertical line divides features and members which, while, like forehead and chin above and below, and nose and mouth immediately, they are of importance in respect of function and magnitude, and not susceptible of division without destructive mutilation. Artistic expression is bound up with concentration of effect, with the predominance of chief over subsidiary interests, of self-explanatory over undecided and ambiguous purposes, of the indispensable and the vital over the arbitrary and accidental. Upon this ultimate principle depend the propriety and obligation of presenting the expression of the most important adjustment for convenience and delight upon a principal façade. The most universally expressive features as elements in architectural combinations are doors or porches and windows,—the manifest opportunities provided for access to the interior and egress, of admission of light from without, and of outlook from within. A balcony on an upper story partakes of the expressiveness of a doorway; the purpose of a window is emphasized, first, of course, by exceptional magnitude, and then as either projecting independently like a bay window, or as participating with others in the advance of the apartments they belong to beyond others adjoining.

Strictly speaking, then, we seem scarcely justified in admitting a characteristic front in the absence of any entrance at all, and indeed of a main entrance. Whitehall, therefore, presents no true front to us as we see it from Parliament-street. As a matter of fact we know that we see the exterior side of an apartment which was to be part of a range of buildings from the interior of which it was to be entered at one end; but interpreted by its architectural expression it ought to be the back of a building, and when we allow this interpretation and consent to forget the matter of fact, it is worthy of high admiration. This indulgence is only an addition to what always has to be conceded to the architect "for the solecism of making what is one room internally look on the exterior as if it were of two stories" (Fergusson).

The windows in each story are seven, and thus a central line would pass vertically through central windows, and this distinction in favour of a back rather than a flank elevation, has other studiously-disposed enhancements. The three central windows, upper and lower, are in the intervals of four engaged columns, while the pairs of windows on either side are divided by pilasters; the composition has thus a well-marked and predominant centre and wings; the windows of the lower range, again, have alternately segmental and triangular pediments so ordered that the central window with an angular pediment

is between two others with segmental, which thus complete a regular symmetrical triplet. The pairs of windows on either side are appropriately subordinated as odd,—as thus uncompleted symmetries, and, moreover, as being flanked only on one side by coupled pilasters.

To recur again to the analogy of natural organisation, which, rightly conceived, is so instructive as to make it always worth while to take some trouble to rescue it from crude misapprehension,—we may compare the scheme of symmetry of this composition of Inigo Jones, with that of the erect human figure which exhibits a central mass of the trunk with the right side and left disposed on either side of a median line in true correspondence, and then flanked by members,—the arms, which are similar each to each, but are not susceptible like the trunk, of division severally into symmetrical halves.

It becomes matter for consideration,—matter for arbitration by combined judgment and taste in particular instances,—how far the liberty of an independent symmetry can be conceded to lateral members. It may be thought that such a concession will involve forfeiture of visible organic coherence. This is surely no fanciful danger. It may be illustrated by two consecutive woodcuts, 144, 145, in Fergusson's "Modern Architecture." In the new Bourse at Lyons the relation of the wings to the centre depends on little more than agreement in height of the stories. The wing has its well-marked independent symmetry, and not only so, but the windows have a treatment quite different from those of the centre, and the centre, notwithstanding its importance, has in consequence an appearance of intrusiveness between compositions which a centre is bound to dominate in their own style. In the other example, the Custom House at Romen, a weak centre seems to owe what importance it can assert to the supplementary service of connecting the pair of symmetrical wings. With these may be favourably contrasted the entrance to the Ecole Polytechnique (152), of which Fergusson justly applauds the elegance.

Nature presents to us, in the varieties of leaves, an abundance of schemes of symmetry which it is not difficult to translatinate into terms of architecture. In a perfect specimen of the beautiful rose-leaf, the principle of subordination of similars that governs unity is very marked; a terminal leaflet of superior size and exclusively central position dominates a series of associates distributed laterally, which are scarcely distinguishable in form, but diminish in size by beautiful and conspicuous gradation. The façade of Holkham House (Fergusson 132) may be cited to illustrate the principle in architecture, though we must seek for a better example of its capabilities of beauty.

On the other hand, in such a compound leaf as the horse-chestnut, three leaflets on either side again diminish in size progressively, and have general resemblance to the central leaflet, but the resemblance declines successively together with size from the nearest to the most remote, while yet, like the leaflets of the rose, they remain for the most part individually symmetrical.

Another type of leaf supplies an analogy to those compositions in which the lateral members, as in the cited case of Whitehall, are correlative indeed, but without independent symmetry. In the lobed leaf of the sycamore, and others of the class, we see repetitions on either side of the form of the terminal apex, but this alone is truly symmetrical, the repetitions on either side becoming progressively more and more unequal-sided.

Such differences are in some leaves quicker, more decisive, and more complex or numerous than in others, but it is rarely, indeed, in the fully-developed and well-grown specimens, that we can fail to recognise a characteristic beauty, and that the character and the beauty are resultants of some principle of specific proportion. In architecture there is the same variety,—if it were daring to pretend to assert the same uniform success, in schemes of grouping. In respect of these, it is more prudent to indicate the liabilities to error than to attempt to formulate conditions of success. The cases seem somewhat more simple where an elevation is not distributed between centre and wings; but even here the expression of centre may be either unduly weak or unhappily and incongruously exaggerated. Such things have

been as attempts to give decision to a uniform elevation by a mere escutcheon over a doorway, or a meaningless and paltry medallion upon a cornice, and sometimes still more unfortunately, by a horn-like pinnacle at the angles. On the other hand, as incongruous an effect may result from an excessively wide and lofty entrance as from one that is insignificant and pinched, and from overcharged ornament exclusively lavished on a central window or balcony.

The superior dignity of a central division of a façade may be traced as dependent on differential breadth or height or elaboration. Confining ourselves to the consideration of breadth as between a central and lateral divisions or wings, it is manifest,—and we have only to turn over our books for examples,—that the error may be as serious for the central to reduce the lateral to utter insignificance, as for it to suffer in itself by a degree of restriction inconsistent with the natural claims of its position.

When the superior advantage of simple proportions in architecture is recognised, it is at least fair to speculate on a prerogative advantage for those breadths of a centre which would conciliate the advantage doubly,—that is, which should compare in a simple proportion with each associated wing separately, and then with the pair conjointly. The simplest proportions are those of low numbers, which differ only by unity. Thus, if a central division measures 4 parts to a wing of 3, we have first this simple proportion of 3:4, and then as between centre and breadth of wings jointly, the proportion 4:6, which is equivalent to the simple proportion 2:3.

Combinations of this class, however, prove to be very few in number; and speculation,—for we are now concerned with no more, by no means with results of certified authority,—speculation is justified in considering the claims of combinations which are next in order of simplicity,—as those in which the central division has at least, though it has alone, a proportion in the simplest terms,—to the joint measurement of the wings; as, for example, a central division measuring 7 parts against a wing of 4, gives a proportion of centre to the wings jointly as 7:8,—what is technically termed a super-particular ratio; that is, a ratio with a difference between its terms of unity.

Assuming this proposed extension, we may tabulate two exhaustive schemes of proportion, accordingly as the central division is to have a less breadth, or a greater breadth than the breadth of the wings jointly.

Wing.	Centre.	Wing.	Centre to Wings jointly.	Wing.	Centre.	Wing.
1	1	1	2:2	2	1	0
1	1	1	2:3	3	2	1
2	3	2	3:4	4	3	1
2	4	2	4:5	5	4	2
3	5	3	5:6	6	5	2
3	6	3	6:7	7	6	3
4	7	4	7:8	8	7	3

This tabulation, may, of course, be carried on to any extent; but it is probable that its limits comprise every case to which the principle would be effectively applicable.

The consideration of the appropriate characteristics of front, and flank, and rear, in architecture, recalls a problem of some interest. In what way was the principal front of the Parthenon defined with appropriate conspicuousness, considering its precise architectural uniformity at either end? Modifications of subordinate proportions, and those systematic and intentional, are discoverable; but much too delicate and remote from comparison, at the instant, to inform the visitor to the Acropolis that what first presented itself to him was the back of the temple. So, it would only be on close examination that the procession on the frieze would be seen to be moving from the west eastward, and to be so treated by the sculptor, indeed, as to only bear being looked at with pleasure, when followed in this direction. It is possible that the metal grille between the columns, which protected and expressed the seclusion of the treasury, the western apartment of the temple, may have had an accepted significance. Again, the sculptured composition in the western pediment was characterised to the keen apprehension of the Greek as subordinate, by the fact that the central place was not occupied by the goddess of the dedication,—this distinction was reserved for the eastern front,—but was distributed into opposed sections, each with its protagonist. Still, after all this is taken into account, it is difficult not to fall back on the assumption that a difference duly expressive and recognisable,



even at a distance, must have been made in the lost acrotorial ornaments that surmounted the angles as well as the apex of the pediment.

#### ROYAL ACADEMY PICTURES.\*

Portraits may be classified in four groups: portraits in which pictorial effect is the main object; portraits that are realistic in feeling and composition, but conventional in colouring; portraits that are distinctly and strikingly realistic; and portraits that are simply bad. Of the last class, always to be found in a certain proportion in every extensive exhibition, the less said the better, so we will pass them over; without by any means implying that all portraits we pass over belong to that sad class. Of the portraits which are firstly pictures, and only secondly portraits, the first noteworthy example is Mr. Millais's "Dorothy Thorpe" (43), one of the best works of the year. This is a child kneeling before a silver bowl in which she is mixing or making something, her proceedings being watched with interest by two dogs. The face of the child is pretty, rather expressionless, but painted with exquisite truth and finish, the hands rather less carefully (hands get sadly neglected in many otherwise able portraits); the dogs are painted with life-like fidelity. The whole group forms a brilliant combination. "A Portrait," by Mr. Watts (193), though a mere half-length figure of a young lady, comes under the category of picture-portraits; the abstract beauty of form and of the blending of warm though subdued tones is the primary object of the work, which is hardly like nature in its colour effect. Mr. Orbachson's "Mrs. Robertson" (377) comes under the same category, though in another kind of sense. It is a very large picture, not so much a portrait as the interior of a room, part of which is occupied by a lady seated in a chair. The whole is composed in that peculiar key in which cold buffs and browns predominate, and which Mr. Orbachson may be said to have invented, and in which he produces always original and often happy effects. In this case he has taken all the colour of life out of the face of his sitter to prevent it clashing with his prevailing tones; with singular unhappy effect; and the painting must be said to be far too large for its subject. Into which category to put Mr. Millais's beautiful portrait of "Mrs. Budgett" (505) we hardly know: it professes to be no more than a portrait, but is charming in pictorial effect from the delicate combination of the white dress with pale orange flowers and the wash at the waist, and the beautifully refined and interesting countenance is painted in the artist's finest manner. Mr. Morris's "Mrs. Phil. Morris and her Daughter" (705) is also a pictorial portrait, very pronouncedly so, but it is too heated and ink in tone.

Mr. Oulsen's portrait of "Sir Frederik Roberts" (23), though in a sense realistic enough, is very carefully arranged with a view to effectiveness, as becomes a portrait "painted for his brother officers of the Royal Artillery," and probably intended to be hung in a conspicuous position. The artist has availed himself well of the picturesque details of dress afforded by the artillery uniform, the furled cloak, and the medals and decorations with which the eminent soldier is illustrated, and has produced a portrait which, while appearing to be a good and characteristic likeness, and quite unaffected in manner, is at the same time highly effective as a picture. Mr. Blake Wigram's seated figure, "I cannot mind my Wheel, whether" (19), is obviously a portrait, pretty far rather weak in style and expression; but better is his half-length of "Mrs. Charles Holland" (3), a portrait of an elderly lady, in which the face is painted and modelled with great delicacy. Among the works that are simply portraits, but with some speciality of effect, Mr. Orbachson's half-length of a gentleman busy about some fishing-tackle (51), is remarkably good; here Mr. Orbachson has managed to indulge his predilections in colour very successfully, without sacrificing his sitter's complexion in the process.

Among the entirely realistic portraits, those of Mr. Holl are, as usual, pre-eminent; but his portrait of "Captain Sim" (260), painted for the Board-room of the Surrey Commercial Dock Company, appears, in its position on the line at the Exhibition at least, as too hard, and the high lights on the face disagreeably prominent;

hung at a greater distance from the eye, as it probably would be in the position it is intended for, it may appear less harsh. Mr. Herkomer has made a remarkably spirited portrait of Mr. Archibald Forbes, the "War Correspondent" (787). Mr. Collier's best portrait is "The Lord Chancellor" (633); his "Charles Darwin" (1465), painted for the Linnean Society, may be a good likeness; it is a much less interesting one than that painted by Mr. Oulsen three or four years ago, and surely need not have been so stiff and perpendicular in attitude. Mr. Millais's "Cardinal Newman" is a very finely painted head; the treatment of the scarlet robes is peculiar, and certainly does not give the idea of the texture of the material; the painter seems to have been desirous to get sufficient shadow into it to tone down the real colour as much as possible, and has produced rather a nondescript surface which represents no special material. Mr. Tadema's portrait of Mr. Whitchord is one of the most highly-finished paintings in the exhibition; the artist has, to a certain extent, lost force and life-like effect in his endeavour after finish of surface and harmony of tone; but it is the best portrait, as a work of art, that has ever been painted for the Institute of Architects.

Although we have called this a strong exhibition, the remark will perhaps not be applicable to the landscape section, in which the works of striking excellence are not numerous. Some of the leading works are too much repetitions of effects which their authors have become enamoured of. Mr. Peter Graham's "Inflowing Tide" (77) is chiefly noteworthy as a painting of the effect of rocks covered with seaweed, half seen through shallow water; the effect in the foreground is wonderfully real, but we have seen it all exactly before. In the same painter's "After Rain" (274) we have an effective variation on his other favourite theme, a landscape with rough Highland cattle in the foreground; it is one of the most effective of its class. Mr. Brett's "The Grey of the Morning" (506) is his principal work,—another of those wonderfully real paintings of Cornish coast scenery of which we have had several; it is hardly equal to some of its predecessors, but exhibits this artist's wonderful power in the precise reproduction of the tone and d-tail of sea sand and rocks and seaweed. The breaking sea strikes us as a little too hard and stony in appearance. Mr. Brett's smaller work, "A Falling Barometer" (128), is the more powerful of the two; here there is only sea and sky, save a group of rocks protruding above the water in the foreground; around them the water is beginning to foam and whiten in that ominous way in which the sea seems to tell of a coming commotion of the weather, even before the surface of the water is visibly much agitated; the sky is a lowering one, and the whole aspect of the work bears out the title remarkably. That Mr. Brett's method of treating landscape has its very definite boundaries, beyond which it cannot pass, we have always considered; so much of the poetry of nature as can be attained by the most accurate representation of natural fact he gives us; of the power of giving the feeling of nature apart from the painting of detail we do not find much in Mr. Brett's work; his praise is to be triumphantly complete within the limits he has marked out for his efforts, and that is much to say.

It is a curious contrast to turn from these to Mr. H. Moore's large study of sea, called "Winter and Rough Weather" (557), containing no incident whatever but the painting of a grey, foaming, wintry sea. Realism there is not in this, for no one can say that this actually resembles water in tone, but it resembles the movement and what may be called the wrath of sea under a strong gale, and conveys in a striking manner the cruel aspect of the sea under such circumstances. There is less ability, but more of genius, in it than in Mr. Brett's wonderfully real, but mostly placid, scenery. Another way of painting water is shown in Mr. Colin Hunter's "Waiting for the Homeward Bound" (1520), in which the effect of reflected light on water which seems to be still agitated from the effects of a gale which has subsided is the main point of the painting; the movement and welter of the water is very well represented in detail, but the run of the main undulations seems somewhat too regular and mechanical. Mr. Hamilton Macallum paints the reflection of sunlight on calmer water in "Music o'er the Water" (773), where the foreground is occupied by part

of a coasting craft, from the deck of which the spectator seems to look. As to the effect on the water, that is pretty and very clever, but it is rather a mannerism. Mr. Macwhirter's "Il Penseroso" (1536), is a view over the sea also, with a fine aerial effect on the distant water and sky, and a foreground which is a little weak, though the weeping birch, which gives the name to the painting, is beautifully shown in its silvery grace. Mr. Leader, who showed new powers in a work exhibited last year, does well and effectively in a rather large landscape, "In the evening there shall be light" (737), where the light from the western sky is reflected over a partially-flooded evening landscape, with an old church on the left; but though there is a certain solemnity of effect, the artist seems to have returned in this painting to that hard and somewhat conventional style which has long characterized his paintings, and which he had shown promise of emerging from. Of Mr. Keeley Halswelle's landscapes, the best is "Three Counties, from Whetnam Hill, Petersfield" (722), a view from an eminence over a great tract of country; this is painted in a very fine solid style, somewhat heavy in colour and possibly a little deficient in aerial perspective, but in the main a painting which deserves the good place assigned to it in the hanging. Mr. Macwhirter's large landscape, entitled "Ossian's Grave" (219) is a powerful and poetic work; we look up from the foreground, where a weather-worn stone marks the imagined site of the burial-place, up into a wild Highland landscape of rocky peaks, around which the clouds drift and curl in great masses; the green of the foreground is a little harsh in tone, but the general effect is very fine and wild. The landscapes of Mr. H. W. B. Davis, in a much quieter style, both in regard to subject and artistic treatment, are equal to anything which this artist has hitherto painted, though we cannot help feeling that he is a painter who has not realised the promise of work of the highest class which some of his earliest paintings gave. His picture entitled "Sea and Land Waves" (376), embodies a fine idea, the effect of wind seen at the same time on the sea in the middle distance and on the long luxuriant grass of the meadows in the foreground, which is all blown into the semblance of waves by the breeze; the effect is very well given, and there is no lack of air and sunlight in the scene. Mr. Alfred Hunt is represented, we regret to say, by only one picture, a view on the Thames at Sonning (1449), the river occupying the foreground, with the bridge on the right, and on the opposite bank houses and rich masses of trees, from among which rises a church-tower. The painting is in a quieter and less poetic vein than Mr. Hunt usually illustrates; it is remarkable for the minuteness with which all the details of the scene are shown, so that we seem able to trace the way into the heart of the scene on the opposite side of the river, and for the fine and delicate painting of the many-toned masses of foliage, the character of which is brought out with the greatest delicacy, yet without a touch of hardness; a soft hazy warmth seems to pervade all the atmosphere of the scene. Why such a work as this should be hidden away in the corner of the last room, and a hard and utterly commonplace painting, like Mr. Oaker's "Porchester Pool" (70), should be given a central place in the front room, is one of those proceedings in the treatment of landscape which the Academy should find it hard to explain, and still harder to justify.

Of Mr. Hook's landscapes, of which there are several, the best, on the whole, is "Culler Herin" (303), which is unfortunately placed for effect by the side of the President's "Phryne"; there is a good specimen of his style in a central position in Gallery II.,—"Castle Building" (123),—which differs rather from his usual subjects in being an inland or inlet scene, and not a view over the sea. All Mr. Hook's fine qualities appear entirely unimpaired, and also entirely unaltered, in this year's exhibition; but admirable as these qualities are, we cannot but be conscious of a great deal of repetition in his works. One of the most delicately-painted and fascinating bits in the exhibition is Mr. A. Goodwin's "Voyage of Sindbad the Sailor" (157), a scene on the shore of an island on which strange flamingo-like birds walk about, while Sindbad, from the top of a rock, waves a signal to a distant ship; this is a beautiful aerial landscape, with a charming air of romance about it, and the shallow pool in the foreground, in which the gold fish swim about with their shadows following them on the sandy bottom, is

\* See p. 533, ante.



remarkably real. "On the Beach at Scheveningen" (833) is a fine seaside painting by Herr Mesdag; and one of the most effective landscapes in the exhibition is to be found in the water-colour room, in the shape of an exceptionally large and powerful water-colour, by Mr. A. Croft, the "Valley of the Lledr" (906). These include most of the landscapes that call for special remark. We will say something of the sculpture separately.

#### ARCHITECTURE AT THE PARIS SALON.

WHATEVER unanimity of opinion there may be regarding the want of a high degree of merit in the pictures that form this year's *Salon*, there can be no two questions as to the great excellence of many of the architectural drawings that occupy so worthily a large space this year on the walls of the Palais de l'Industrie. There certainly seems to exist in the schools of Paris, in a higher degree than is the case in any other contemporary school, the show of a respect and veneration for the great architectural works of the past. This is seen not so much in the works in course of execution as in the very great importance attached year after year to the learned restorations that are exhibited by the architects, restorations so elaborately produced and so skillfully executed that, apart from their being scientific statements, they possess a decorative value as works of art, as pictures, indeed, on the walls of the *Salon*, that renders them certainly equal to the best of the painted canvasses that hang so noisily by their side.

Whatever may be the opinion of the English critic on the modern school of French architecture,—and in none of the contemporary arts is the spirit which inspires the profession in both countries more singularly at variance than is the case in France and England,—it is impossible to deny the skill and taste of the French architects in the "get-up" of their drawings. With the amount of wall-space so generously accorded to the architects, their English professional brethren may well envy them the privileges they enjoy. What would be said in Burlington House of one whole side of a large room being covered with the plans, elevations, sections, and photographs, accompanied by a plaster model (to 1-20th) to illustrate M. Corroyer's grandiose Comptoir d'Escompte in the Rue Bergère, Paris, of which we gave not long since two views in these pages, and which, now that the central pavilion is completed, forms a conspicuous feature from the Boulevard? With the ample wall-space at their disposal, the French architects are thus able, in a manner unknown to their English brethren, to exhibit those large geometric and detailed drawings which alone afford the professional critic the means of judging of the merit of a design. Whatever may be said by some English critics regarding the practical deficiencies of certain of the drawings produced by the French architects, such a criticism could not with justice be passed on the architectural drawings, as a whole, exhibited in this year's *Salon*.

With respect to the original designs,—of which there are not so many as one would expect, considering the large space allowed to the architects for the display of their noble art,—the English visitor would certainly complain of a less variety than he is in the habit of seeing at home. This, perhaps, arises from the academic tendency of French architecture, and the devoted adhesion of the architects to certain styles, about which their minds are long since made up. In this respect the visitor will be very frequently disappointed, but his indulgence must be exercised; he must remember that, however highly instructed and thoroughly well educated an architect may be, it is only the very few who are gifted with the lofty power of design. What original designs, purporting to be such, are exhibited, will, we are afraid, only excite the astonishment of the English architect. Originality seems too often confounded with eccentricity, and when the French architect leaves the well-ordered lines in which he has been trained to work, his power seems to desert him. It is somewhat unfortunate that it is chiefly these eccentricities that are exhibited, the practical in France being left to a more modest and hard-working section of the profession, whose labours are not adequately represented at the *Salon*. When one sees, as there are now so many opportunities of doing in Paris, the design of the modern architect carefully carried out by the skilful workman, it is difficult

not to be charmed and instructed by the thorough and intelligent manner in which every detail is rendered either in wood, stone, or iron.

If the ornamental is evidently considered in a large number of drawings devoted to the study of interior decoration,—drawings, it may be observed, which are masterpieces of manipulative skill,—the practical is also represented. M. Calman's project for a school at Levallois-Perret will satisfy all the exigencies of the practical student, for the all-important question of the lighting of the rooms has been a matter of close consideration, the angles at which the light enters each of the windows being shown by special diagrams. M. Dapras's plans for a *crèche* are scarcely less of an eminently practical nature; while various other designs of school-houses, town-halls, private dwellings, *abattoirs* or slaughter-houses, clubs, theatres, and churches show each respectively no small power of combination of utility and beauty, always according to the prevailing French ideas.

It is in their restorations and in their studies of existing monuments that the French architects came out strongest at the *Salon*. Of these, M. Paulin's magnificent restoration of the Baths of Diocletian, which occupies about eleven frames, and covers one whole wall and portion of two others, unquestionably stands first, not only as a work of profound archaeological erudition, but as a work of art. It is alone in the quiet of the Villa Medici that such a series of drawings could have been produced. Even among the *Prix de Rome* studies, which so invariably excite the admiration of every architect who has seen them, M. Paulin's restoration of the Baths of Diocletian may be said to hold an exceptional place. The consideration of the polychromatic decoration, the mosaics, and the statues shows the most careful research, while the execution of the wall-paintings in their presumed original positions is masterly. There are not wanting many other drawings of a similar nature, if scarcely as serious as this classical study; drawings in which the severe training, the careful observation, and the artistic skill which the education of the schools and the teaching of the late lamented Viollet-le-Duc engendered in the young architect are amply evident; such drawings as the plans, elevations, sections, and details by M. de la Roque of the beautiful Hôtel de Ville of Amboise; and the same architect's studies of the quaint Church of Ryes, in Calvados; or, again, M. Paul Gou's masterly pen-and-ink sketches of a number of the historical monuments of Saint Emilion, in Gironde, a spot better known, perhaps, for its excellent wines than for its architectural beauties. M. Deverin's careful studies for the restoration of the quaint and well-known Chateau de Chinon,—interesting to every Englishman from its connexion with our Plantagenet race, not to mention Rabelais and Joan of Arc,—are models of a method which we should be glad to see more universally adopted in England than is the case; indeed, did we follow in this respect more closely the procedure of our French neighbours in the preparation of the plans and other necessary documents relating to any great work to be restored, and then allow these plans to be exhibited, there would, we suspect, be less ground for complaint than at present exists in such cases. M. Formigé's series of drawings for the restoration of the well-known Romanesque church of Notre Dame la Grande at Poitiers belongs to the same category of careful studies which the French Commission of Historic Monuments obliges the architect to employ to produce before proceeding to take any steps. To the same class belong M. Nagle's studies for the restoration of the Chateau de Rochechouart in Haute-Vienne, a series of six large frames giving actual views of the various facades, with plans, elevations, and sections of the proposed restorations. M. Guadet's perspective view of the present sadly shorn but picturesque condition of the Parthenon is one of those careful water-colour studies such as the architect seems alone capable of producing, and which the unbiased brother painter is ever ready frankly to admire; happy recollections of happy hours do such drawings suggest; studies like those by M. Guenepin, at Assisi, or those by M. Nadal, at Sienna, or M. Moyaux's drawing of the quaint early church of Sta. Maria di Toscanella.

Prepared with the care exacted by the Commission of Historic Monuments, M. Selmersheim's project for the restoration of the delicate Hôtel de Ville of Noyon is, as a decorative object alone, a work of art, while, as a professional

work, every guarantee of competency seems evinced in the studies for the town-hall of so interesting a spot as the birthplace of the great Reformer, Calvin. M. Liech's study of the excavations of the Roman arena at Saintes is a model of architectural and pictorial drawing, a remark equally applicable to M. Coquart's sketch of the arch of Hadrian at Athens. The same may be said of M. Hardy's large studies of the wonderful ancient brick-built fortress of the *archevêché* at Albi (now, if we mistake not the prefecture), as imposing an edifice, with its terraces and castellations, as the most romantic mind could expect in the country of the Albigeois. M. Morel-Revol's series of large-sized architectural and archaeological studies of the interesting ninth or tenth century Provencal chapel of Saint Aubert are drawings which show how thoroughly the architect has penetrated the half-classical characteristic local style. M. Simil's detailed studies of the Cathedral of Bayeux are models of archaeological accuracy, giving ample details of the *armatures* of the treasury in the cathedral, with its quaint early Gothic decorations and costume, together with studies of the tiling of the chapter-house. Drawings of equal merit of many others of the too little known archaeological treasures of France meet the eye at every turn, as if to compensate by their beauty for the sad amount of ugliness with which modern days has inflicted the country. What would the old architects say did they but see the abortions that their successors are now setting up in the guise of architectural creations? To what, one feels inclined to ask, does all this archaeological study lead? Is it to produce no effect? Or is it that the true admirers, the followers of the old traditions, modest unassuming students, are pushed rudely aside by the more demonstrative and less informed brethren? Perhaps this is more the case in France than even in England. Certainly, the architectural exhibition at the *Salon*, and the means of comparison it affords between the work of the modern architects and that of those who study the creations of the past, would seem to justify such a belief.

#### ON POISE OF THE FIGURE IN SCULPTURE.

THE human form being lofty for the size of the two feet on which it is supported and moving on walk is, in degree, a series of alternate poises, and, wittingly or unwittingly, the effort for preservation of balance is ever in action. Thus it may be seen that grace and dignity of bearing, as well as security in movement, depend upon how this is done.

The human race are the only beings that truly walk erect. The ape's attempt is but a painful imitation, and the bird, although it walks firmly on two feet, holds its body inclined. The structure of man is, in degree, columnar on its moving base. He walks upright and thus preserves his supremacy. The serpent alone could have raised his body erect on the circle of his tail, but he now grovels in the dust.

The human being also can lie down more completely than any other creature, except the serpent and the worm, and he can kneel and sit as well as stand erect. He has more varieties of attitude than any other animal, and thus his more figure, even without regarding the features of his face, possesses by far the greatest power of expression. In death, and its semblant sleep, man lies prostrate on the earth. He rises in the morning, and kneeling gives thanks and prays to his Maker. He erects himself straight upon his feet and goes forth to his daily labour. He sits down when he is weary and refreshes himself with food. He cannot fly and emulates the bird because it would cause so much inconvenience in the present state of the world that this power has been denied him; and he makes but a poor affair of swimming, for even the frog is his superior in the water.

By very far the most expressive element in art is the human form,—the variations of the features of the face the most so, as they directly express the passions, but they are almost equalled by the character and movements of the figure. Of its different positions the four great divisions are those of standing erect, sitting, kneeling, and lying down; but besides these there are a number of intermediate actions in which, as in the principals, poise is an important element. Among these intermediate actions semi-recumbence yields magnificent attitudes, of which the figure of Adam in Michel-



angelo's creation of man is a striking example. The imaginary position of flight yields others, of which the celebrated Mercury of John of Bologna is a fine instance. The rushing forward action of the Warrior of Agassiz, the bending figure of Jason unloosing his sandal, and the well-known positions of the crouching Venus, present other intermediate actions of great expression and grace. Nevertheless, the most majestic positions of the human being are those of adoration, uprightness, and thought, kneeling, erect, and sedent. And, in each of these especially, poise is an important constituent of their expression, grace, and dignity.

The rules given by ancient and modern authorities for the poise of the erect figure have much in common, the most conspicuous being the one which provides that, in the attitude of resting on one leg, the centre of the neck between the collar-bones under the chin should, when regarded in the front view, be perpendicularly over the ankle on which the weight of the body rests. The usually strict adherence to this doctrine by the modern schools of sculpture may have led to some monotony in the poise of their erect statues, and a greater latitude and variety in this respect may be observed in the balance of several of the most celebrated antiques, neither the Antinous of the Capitol nor the Venus of the Uffizi, for instance, resting wholly on one foot. Few, however, of the antique figures rest equally on their two feet, except in the case of caryatid statues, or those imitative of Egyptian models. Permanence being the aspiration of the Egyptian theory, art in that country, in being its expression, adopted the most immovable and steadfast positions, and thus the colossal sculpture of the Egyptians partook of the rigidity and uniformity, as well as of the massiveness, of their architecture. Their sedent and kneeling figures have thus their sides in correspondence, as well as their erect colossi, which are stationed like columns, as parts of the façades of their temples.

Rarely also are figures in modern art posed equally on their two legs; a marked exception, however, exists in the statue of St. George by Donatello, which was so lauded by Michelangelo, and of which the firmness so obtained may have been adopted to represent the appropriate steadfastness of a warrior. It would scarcely have occurred to our great general, Wellington, when he insisted on being pictured standing equally on both legs, that he was imitating the position of our patron saint as sculptured in front of the San Michele Church at Florence. It was to Sir Thomas Lawrence, when engaged on his full-length portrait with his Waterloo blue cloak on his shoulders, that he said, "It is my habit to stand on my two legs, and I desire to be so represented." It may be acknowledged, also, that this picture is accepted as being the most characteristic of the portraits of the great duke. Something may be said, therefore, for allowing sitters, as they are called, whatever may be their attitudes, to have their views taken into account.

The four supporters of a quadruped scarcely call for the exercise of the effort of the poise and balance; and the spreading feet of birds afford far wider bases of support than those of man, which are comparatively short and narrow. Thus the necessity for the exertion of his quality appertains more to man than to other creatures. One of the first endeavours to which the dawning intellect of a child is addressed is that of raising itself upon its little feet and tottering towards its mother. And the first few steps accomplished in this way is its earliest advance in life, and a source of triumph like to the child and its parent.

Balance afterwards rapidly becomes an instinct, ceasing to require attention, and the natural actions of walking and running are accomplished without a sense of it. When, however, a new mode of progression is adopted, as in skating or the use of the bicycle, a similar effort as at first has to be exercised, and we are children again until we acquire the instinct of balance in our new method of movement. Even in dancing, balance has to be studied anew, and so in horsemanship, as in the saddle a secure seat more depends on poise and balance than on pressure of the knees.

The question of poise too early entering into movement and carriage of the body in nature may well occupy a similar value in it. The little more or less forward or backward, to this side or that, that a figure is posed, may make a vast difference in its ex-

pression, character, grace, and dignity, and may well be a subject of care and of careful regulation. In respect to the poise of a statue, there is no example that has lately come more prominently forward as a subject of discussion than that of the celebrated antique, the Venus of Melos, which stands by itself in one of the salons of the Louvre. Within the last few years two different poises for this statue have been advocated, and, in deference to this variety of opinion, the directors of the Crystal Palace have, in their magnificent collection of casts from the antique, had two copies of this statue placed side by side in the Greek Court, adjusted respectively according to the two theories. In one case the poise is according to that in which the statue was first placed in the Louvre, and the foot on which it principally rests is planted horizontally on a level surface as on that of a usual floor. In the other and newer adjustment, this is disregarded, and the surface on which the foot stands is inclined backward, and the figure, which, in the first instance bends slightly forward, in the latter is thrown more back and rests on its heel.

Of this latter arrangement in the pose of a Venus there appears to be but one other example, namely, that of the Venus of the Capitol; in which the upper surface of the plinth on which the figure stands slopes so much backward that, were it readjusted so as to be horizontal, the figure would be so much inclined forward that, in nature, she could not possibly stand.

The balance, however, of the Venus of Melos is quite easy and natural in the poise originally adopted, in which the upper surface of the plinth is horizontal; and it must be acknowledged that, according to this adjustment, the bearing of the figure is perfectly dignified and graceful. It is true that, being mutilated in respect to its arms, of which we can only conjecture the positions, we cannot absolutely to a nicety judge the action of the figure, but that consideration does not so much affect the poise of the figure backward or forward as that which is lateral; and the outstretched left arm, possibly supporting in its hand something of weight, may account for the very decided manner in which this grand antique stands posed on her right foot, the left being slightly raised on an elevation on the base.

Of the ancient sculptors of note of whose works we have remains, none seems to have adopted so liberal a sway of poise as Praxiteles, examples of which treatment exist in at least three of his extant statues, which attain this freedom of line by means of one arm resting on or against a support. These are his celebrated Faun, his Apollo Sarcotomos, and his Hermes with the infant Dionysos, lately discovered at Olympia, of which there is a cast in the Elgin Room of the British Museum. A similar instance of modified poise is also to be seen in the well-known Apollino, leaning on a small tree, in which likewise the resting of the figure is divided between its natural and an adventitious support; but in all these cases the result is graceful and pleasing.

Indeed, grace of poise and bearing is equally attractive as beauty of form, and may partake even more directly of the character of the mind than does the form of the body with which the latter is associated. It may be not too much to say that the poise and carriage of the figure is indicative of the balance of the mind. A vacillating spirit will be betrayed in the outward form by an uneasy position; stability of purpose, on the other hand, will be shown by firmness of action; grace of thought by an easy undulation of the limbs; and serenity, by a sweet repose of attitude, in which the body partakes of the tranquillity of the mind. Thus it may be conceived how important these considerations are in art, among whose elements of expression none are more efficient than that adjustment of the figure which may convey truly the sentiment and passion which may be supposed to inspire and control the action of the form which the sculptor portrays, and which is the subject of his thought and labour.

"Great Paul."—The new bell for St. Paul's Cathedral, which has been cast by Messrs. Taylor, of Loughborough, is, we believe, now on its way to London. It is being conveyed on a specially-constructed trolley, which will be drawn by two traction engines. The bell is expected to reach its destination in about a week. The total weight is 19 tons.

## GREAT ENGINEERING WORKS ERECTED IN ITALY DURING THE LAST TWENTY YEARS.

ERRORS IN STATEMENT OF DIMENSIONS IN TEXT BOOKS.

SIGNOR CLERICETTI, an Italian architect, brought before the Conferenza sulla Esposizione Nazionale del 1881 an interesting statement with reference to the chief structures erected in Italy during the last twenty years, an abstract of which will be found in the new number (1881-82, part I.) of the "Minutes of Proceedings of the Institution of Civil Engineers." The structures which Signor Clericetti regards as best illustrating the progress of engineering science are the iron and stone bridges, mostly erected for the carriage of railways. In these, as contrasted with the corresponding works of ancient Rome, lightness, economy, and rapidity of construction have been the leading features. The Roman work, on the other hand, is characterised by grandeur, massiveness, and durability. It is, perhaps, too soon in the day to speak with great confidence as to the question of economy; as durability is an element of ultimate cost which has been of late not always duly taken into account.

To illustrate the difference between the ancient and modern principles of construction, Signor Clericetti gives some account of the famous Roman Bridge built by Trajan over the Danube, the details of which, as given in the paper under notice, do not, however, quite agree with the account given in Knight's "Practical Dictionary of Mechanics." Thus the length is stated by the former authority at 3,960 ft.; by the latter, at 4,770 ft. Signor Clericetti says there were twenty-one arches of 104 ft. span: Mr. Knight says twenty arches of 180 ft. 5 in. span. The thickness of the piers is given by the Italian writer at 68 ft.; by the American at 61 ft. It is possible that the difference thus apparent on the surface of the comparison arises from the use of two different feet by the two writers, as it very closely corresponds to that which exists between the old Roman and the English foot,—the former of which is 915 of the latter. On this view of the case, the figures of Signor Clericetti, which are given in metres, and thence reduced to English feet, are probably to be preferred. But this does not account for the difference in the number of arches. Nor should a work like the Dictionary describe Roman feet, either ancient or modern, simply as feet. The matter is of some importance, as pointing to sources of error in the descriptions given of not a few important structures, notably the Coliseum, as to which building our own measurement of the capacity differs materially from that usually to be found in architectural text-books.

The great thickness of the piers is a marked feature of the ancient bridge building. The old bridge at Verona is described by Signor Clericetti as having a pier 39 ft. thick, though only 11 ft. high. In old London Bridge, according to a survey made by Mr. Giles in 1820, on order of the Committee of the Bridge Lands, out of a total width between the faces of the abutments of 931 ft., 403 ft. 10 in. were occupied by the piers. In addition to this, 175 ft. 11 in. were occupied by the starlings, so that the available water-way at low water was only 230 ft. 11 in., or rather less than a fourth of the width of river spanned by the bridge. The piers of modern masonry bridges are less than a third of the thickness of the ancient examples, and those of iron bridges, less than one-sixth. We have, indeed, in the case of the Solway Bridge, where iron cylinders, used instead of piers, were carried away by the ice, a proof of the folly of sailing too near the wind in the matter of the width of a pier. In the rivers of Italy it is, no doubt, unnecessary to make the same provision against floating ice that is requisite in northern rivers. Thus the ponderous piers which formed such an obstacle to the flow of the rivers must be regarded as mistakes. In this country it has been, perhaps, too much the habit of the engineer to determine the width of the piers exclusively by the weight of superstructure and arch that it has to support. With every temptation, in erecting works that form part of a commercial undertaking, to study economy as far as possible, a temptation certainly to be resisted, we think that the bridges built during the last half-century in England are rather on the side of too light than of too heavy piers.

The Po, between Pavia and the sea, was never bridged by the Romans. During the last twenty



years four bridges have been built across it, of the respective lengths of 1,900, 2,600, 1,399, and 1,312 ft.; the spans varying from 213 ft. to 250 ft. They are all girder bridges, supported on piers, founded at depths of from 60 ft. to 70 ft. below highest flood level, and formed of iron cylinders sunk by the hydraulic process.

The two principal arched bridges recently erected in Italy are the Ponte Annibale and the Ponte del Diavolo. Each of them has a span of 180 ft., the versed sine of the first being 45·2 ft., and that of the second 44·7 ft. The thickness of the crown in each is the same, viz., 6·6 ft. Circular openings of 30·5 ft. diameter are introduced to lighten the haunches. These two bridges are among the largest masonry arches in the world. They are exceeded, however, by the well-known Grosvenor Bridge at Chester, a 200 ft. span; by the Washington Aqueduct, in America, of 220 ft. span; and by a bridge over the river Adda, near the Castle of Trezzo, in Italy, which was built in the year 1370, A.D., and had an arch of 237 ft. span and 68 ft. rise. This arch was long regarded as the eighth wonder of the world, both for size and for rapidity of construction. It was built in seven years and three months. The Ponte Annibale occupied twelve months in construction, and the Ponte del Diavolo only ten.

While the existence of the Chester Bridge gives to the United Kingdom a respectable position among the countries adorned by noble masonry arches, the economy of the later Italian bridges is very remarkable. All things considered, the granite bridge of one arch, of 143 ft. span, built by the Chevalier Mosca over the river Dora at Turin, is the noblest work of the kind on which our eyes have ever rested; probably the finest, though not the largest, bridge in the world. But this bridge cost nearly 100*l.* per square yard of roadway; the Chester Bridge cost 76*l.*, while the Ponte del Diavolo cost 30*l.*; and the Ponte Annibale, 22*l.*

Signor Clericiotti holds that the limiting span of brick and stone arches has not yet been reached, and anticipates the erection of arches of as much as 330 ft. span. It must be borne in mind that two considerations go to decide the question of the span of practical limitation. One we take to be the existence of natural abutments. Where such exist, in rock, at an adequate height above the river or road to be crossed, the ratio between the specific gravity of the material employed and its strength in resisting a crushing strain, determines an absolute limit, to which must be added an empiric factor of safety.

In the famous arch of the Pont-y-tu-Prydd, built by William Edwards over the Taf, in 1750, the span is 140 ft., and the rise 35 ft. Here the abutments are built, but the rise of the roadway is so steep as to render the example of less utility to the architect than would otherwise be the case. The bridge fell down twice while being built, and in the third structure Edwards introduced the cylindrical openings in the haunches which have been adopted by the architects of the Italian bridges above cited. The pressure on the arch of the Pont-y-tu-Prydd is calculated as equal to the weight of 339 cubic feet of the material employed per superficial foot at the crown. At the springing it is about equal to the weight of 935 cubic feet per superficial foot. Such, at least, is the calculation of Mr. T. M. Smith, M.Inst.C.E., in the year 1838. These figures go some way in support of the views of Signor Clericiotti as to the practicable span for a stone arch. The investigation into the stability of arches, which is to be found on p. 439 of vol. v. of the "Minutes of Proceedings of the Institution of Civil Engineers," will be consulted by the architectural student with great advantage. The specific gravity of brickwork is given in Mr. D. K. Clark's "Manual of Rules, Tables, and Data," at from 1·76 to 1·84. "Air-dried chalk," the excellence of which material for interior work, especially in the groining of church vaults, it is hard to rival, is in the same table stated as 2·48 to 2·55. We should like some further information as to the weight of different kinds of chalk. Our own practice certainly leads to the impression that thoroughly dry chalk is less heavy than brickwork; but we cannot bring this impression to the test of actual weighing. Tufa has a specific gravity of from 1·21 to 1·38; and tufa in Italy takes much the same place among building materials that chalk is adapted to fill in England. Wet, indeed, is hostile to each of these rocks, and wet followed by frost is destructive to both. But for interior work the lightness, dryness, and easy working of

either material makes it a great favourite with those who are familiar with its excellence.

It would be of great service to the builder if any competent student would draw up a comprehensive table of the specific gravity and crushing resistance of a complete range of building materials. There is a small table of this kind in a little book called "The Construction of Roads and Streets," by Messrs. Law & Clark, published in 1877. The crushing weight there given ranges from 18·04 tons per square inch for porphyry, to 0·36 tons per square inch for red brick. The table only contains twelve entries, and specific gravity is only given in four out of the twelve instances; but it shows what we require. Mount Sorrel granite, with a specific gravity of 2·67, has a crushing resistance of 5·74 tons. With this we may contrast the crushing resistance of 0·36 tons for brick, coupled with the specific gravity before quoted of 1·76. We should like to see the corresponding figures for chalk and for tufa.

It is evident that tabulated information of this kind is a necessary basis for any sound calculation as to the limiting span of a masonry arch. It is, of course, often the case that the architect has little choice as to materials. But for any work of great magnitude, especially if there be any chance of coming within the limits of the factor of safety for crushing weight, it would be of great utility to have a table of ready reference on the subject. Whether it would be possible to build a wider arch of tufa or of porphyry is a question within the range of architectural science to answer. But it cannot be replied to when one of the elements is wanting. As far as the information now under our hands goes, we are at fault for the statement of the crushing resistance of tufa.

The simplest ultimate form of such a table would be expressed in the height of a column of any material at which, theoretically, crushing would commence.

#### THE STORM AND THE ARCHITECT.

The effects of the storm that has recently swept with such sudden fury over the country may well recall to the student of Shakespeare a remarkable expression in one of his finest plays. In his noble rebuke to John Bates, King Henry says, "War is his beadle, war is his vengeance." It may be said with no less truth that storm is the beadle of the Genius of Architecture, and is at times a minister of vengeance on those men who, in building not for habitation but for lucre, "have defeated the law, and outrun native punishment."

If the storm of the 29th of April has not wrought so much havoc among our buildings as it has caused among our shipping, the cause must be sought in the fact that it is the third or fourth of those wretched "beadles" that within the last few months have tested the solidity of many of our important buildings, and crushed, like egg shells, the unfinished work of the unconscientious builder. Of the extraordinary force of the wind there has been ample evidence, although the anemometers now unfortunately in general demand, which register only the movement of the wind during twenty-four hours, are utterly useless as indicators of the maximum pressure attained; which is the information that would be of value to the architect. One feature of this last storm has been, as far as our own memory and experience extend, utterly without precedent. We refer to the scorched and blasted appearance of many of the trees that were exposed to the fury of the gale. Those with herbaceous leaves, in a tender state of expansion, as the horse chestnut and the laurel, have been the most conspicuous sufferers. But even so hardy a plant as the May or the sloe-thorn has been in many places "taken" with the blast. The appearance of many noble trees is such as to give the idea that they have been subjected to a fiery blast. We leave it to the botanist to explain the evil phenomenon. Its prevalence is unhappily too wide to be a matter of doubt.

The elm has been the chief sufferer by the storm in the way of overthrow, many noble and ancient elm-trees having been uprooted by the roots. Among houses, so far as our personal observation goes, damage has been less than might have been expected, owing, we have little doubt, to the reasons before given. But the trial thus passed through is one that should call the attention of the architect to what we may term the natural history of building. As each

generation has, to a certain extent, its own characteristic architecture, it is the case that times of peril may arise which are especially trying to the work of a particular period. And such, we have had recent occasion to remark, is now the case. In a part of the country which is ornamented by many noble specimens of the English architecture of the seventeenth century, including dated buildings from 1615 to 1687, there have been of late an unusual number of natural deaths,—deaths, we mean, not of inhabitants, but of houses. We must remember that the number of houses in actual building amount to 94 per cent. of the total number of inhabited houses in England and Wales. How many of these may be rebuilding, or undergoing such extensive repairs as are inconsistent with temporary habitation, there are no means of ascertaining; but there is no doubt that during the seventy-two years specified wood was used structurally in houses to a far greater extent than has been the case in some other periods of like duration that might be easily specified. And, by the use of wood, we do not mean the employment of those solid, rough-hewn beams of oak,—consisting, indeed, of the whole tree, rudely squared,—which are the pride of some of the mansions that date from Tudor times. We question whether any building material is more reliable, more durable, and even more fireproof than massive oak timber of this description. But with the projecting stories that were still in vogue in 1615, and yet more with the ornate pilasters, and enormous areas of window, of Jacobean taste, the work of the joiner to a great extent superseded that of the carpenter. Excellence of material, and care in its selection, no doubt, were present; or the buildings to which we refer would be no longer extant. But joiners' work in the exterior of a house has a limited term of existence. Wet or dry rot overtakes it some day. And we have had occasion to remark the sudden yielding, within the last few years, of many very picturesque remnants of Early English architecture. Very sudden, at times, has been the catastrophe. A square yard of plaster may have fallen in the night, or a loose tile called attention to a broken-backed roof. But when the repairer has been called in, it has soon become apparent that it was too late to cobble the work. The point which gave way was only a few hours in advance of the rest of the structure. Plaster fell because laths gave way. Laths yielded because quartering would no longer hold the rusted nails. In fact the wood-work, which had done its work for perhaps a couple of hundred years, had arrived at the natural term of its existence. Repair was too late. Nothing remained to be done but to reconstruct.

#### ON SPEAKING ILL OF ANOTHER MAN'S GOODS.

It is, perhaps, a matter of some wonder that, in these days, when competition is so keen, and men endeavour by all possible means to push their patents or their goods, more actual disputes do not arise in addition to the paper warfare and the advertisements, to which our own pages bear witness. Fortunately, however, the law has allowed a good deal of free trade (if we may so express ourselves) in regard to this question of a man depreciating another's goods, and puffing his own. For it is clear that, wisely enough, judges have done their best to give manufacturers and patentees abundant length of rope, and the consequence has been that, on the whole, several patentees and others have not got into the difficulties which they would have done had the law regarded their speaking contemptuously or otherwise of a man's goods with the same critical eye that it does the speaking in like manner of a man's character. The most recent case upon this matter, which has been not only the subject of a lengthy judgment by the present Master of the Rolls when he was a judge of first instance, but also of an instructive decision of the Court of Appeal, shows this liberal tendency of the judicial mind, and how it has practically affected manufacturers. The case to which we refer is that of Halsey v. Brotherhood, 51 *Law Journal Reports*, Chancery Division, p. 233, and arose out of a dispute in regard to certain patent engines. But our readers will not need to be told that the principles which apply to speaking of engines apply with just as much force to any other article, whether it be cows, ventilators, traps, tiles, or a hundred articles which can be thought



of in an instant. Now, the ordinary rule of law in regard to libel and slander is that actual malice in speaking or writing the words is not necessary to make them ground for an action, and therefore anything false which a man says of another of a defamatory character is actionable, even though the utterer honestly believes that he is speaking the truth. On the other hand, as we have already said, the law allows greater latitude in regard to the slander, as it is called, of goods. In such a case, "no action will lie," says Lord Justice Baggallay in this last case, "unless the statements made were not only untrue, but were made without what is ordinarily expressed as reasonable and probable cause," and further on the same judge points out that unless statements "are made with reasonable and probable cause there would be the inference that they were maliciously made." The same principle was expressed in different, but perhaps more striking, words by Lord Justice Lindley, who says, "If I am a patentee or have property of my own, so long as I act honestly, I am entitled to say that somebody is infringing my patent, or that somebody else's manufacture is an infringement of my patent, without running the risk of having an action for damages brought against me. If I say it honestly, I am not liable to an action for damages; if I say it dishonestly, I am." Of course it is obvious that, unless a man had some ground for saying that a patent was being infringed, he could not be said to make the statement honestly, because there would be no reasonable cause which should make him utter such words. But at the same time it must be borne in mind that some kind of special damage must be proved to have resulted from these statements before they form the ground of an action. This is not always remembered, and the owner of a machine which has been disparaged, who may be of a sanguine nature, without reasonable cause may fancy that damage has resulted from the mere statement without being able in reality to prove any injury. In the case to which we have already referred, one manufacturer had stated of the engines of another that they infringed his patent, and in his defence he further added that he had made these statements *bona fide*, and in the full and honest belief in his rights as a patentee, and it was in these circumstances that the point of law arose. If, however, it had appeared at the trial that the person who made these statements simply did so to make an opponent lose custom, then it is quite clear he would have had to pay damages, and therefore the practical moral of this case is that a man should be careful to see that he has sufficient grounds for making disparaging statements. It may be taken that the bias of the law is in favour of such statements being honestly made, so that a comparatively small ground would be sufficient to prevent them being considered as unreasonably made and without probable cause. That this is so is, as we have said, a fortunate circumstance, otherwise the law courts might be occupied with all sorts of disputes between traders and patentees, whilst, in fact, the true way to settle them is to let the process of natural selection show, in course of time, whose article is the best. For no amount of false disparagement can ever ultimately cause a good article to be lost to the public, nor will all the puffing in the world keep a bad one afloat above a certain length of time, unless some persons prefer what may be called cheap to what is good.

## FROM EDINBURGH.

It may be in the recollection of some of our readers that when the building of the Edinburgh Royal Infirmary was approaching completion, the attention of the directors was called to the alleged unsoundness of the timber used in its construction, and that the matter was referred to an eminent London architect, whose report was favourable to the contractor. It now appears that dry-rot has broken out in several parts of the building, and that to so serious an extent in two of the pavilions as to render it questionable whether it is safe to continue to use them without extensive repairs. A careful inspection of the whole buildings seems to be imperative, and a considerable sum may be required to put matters right.

Two new Board schools are in progress, one at Bryson-road, North Merchiston, and the other at Marchmont-road, Warrander Park, both from the designs of Mr. Robert Wilson, architect for the Board. The site of the latter has been

objected to as unsuitable, the class of houses in this new suburb being fitted for the occupation of persons not likely to send their children to a Board school; but it seems to be expected that this feeling will gradually die out, and that the Board schools will be more generally taken advantage of. Indeed, so far as the buildings are concerned, these schools are far in advance of the generality of private adventure schools, most of which are located in buildings intended to be occupied as dwelling-houses, the ventilation and accessories of which must necessarily be insufficient for the use of a large number of scholars.

Authority has been granted for laying down a new line of tramways to run from the Tron Church, up the High-street, George IV. Bridge, Lauriston-place, Gilmore-place, and thence westward through South Marchiston to the Colinton-road, at a point near to which it is crossed by the Suburban Railway. The contractor is pushing on the works with vigour, and we may expect to see the new route opened up in a few months.

The Suburban Railway is making a visible impression on the southern margin of the city. We notice that a fine group of trees at the southern extremity of Blackford-avenue has suffered considerably, but upon the whole the railway does not seem likely to affect the amenity of the neighbourhood to any considerable extent. In this respect the speculative builder is as much to be feared as any other intruder. The grounds of Greenhill Park, which were stocked with fine timber, have been disposed of for building purposes; the trees are rapidly disappearing under the axe, and the ground will probably, in a short time, be covered by uninteresting blocks of tenemented houses. Such has been the fate of many similar spots, and we need hardly look for builders foregoing pecuniary advantage for the sake of preserving trees where they might place buildings; but in some instances this might be judiciously done so as to enhance the value of the property.

The hydropathic establishment erected on the high ground overlooking the Metropolitan Cemetery and Morningside Asylum still stands, a melancholy picture of desolation. It was stated to have been acquired by the Roman Catholic body for some purpose connected with their church, but there is no appearance of life about the building.

It seems that the common burial-ground in some of the cemeteries has become overcrowded, and the Medical Officer of Health has been making a personal inspection and inquiry into the matter, and is to prepare a report for the information of the authorities. These cemeteries were originally without the city boundaries, but most of them are now surrounded by dwelling-houses.

## NEWS FROM GERMANY.

Nuremberg.—The National Exhibition of Bavaria, the largest of all exhibitions ever held in Germany, will be opened under the patronage of King Louis on the 15th inst., and will remain open till the 15th of October. Nuremberg is the Birmingham of the Continent, and the variety of manufactures, especially in the metals, which will be exhibited, lends the greatest interest to this show in the eyes of Englishmen and other foreigners, as well as the natives of Bavaria and the other German States.

Berlin.—An extensive Exhibition of Hygienic Appliances will be opened in this capital on the 16th of May. The Heraldic Exhibition, which has been opened since the beginning of April, continues to attract crowds of visitors.

Ulm.—It has at length been determined to complete the chief spire of the splendid but unfinished Cathedral of Ulm. The matter was taken up some time ago, soon after the completion of the Cologne Cathedral. Recently, however, it was rumoured that the foundations of the principal tower were not solid or strong enough to bear the completion of the upper portion. A deputation comprising some of the leading architects of Germany and Austria was accordingly appointed to examine this question and report to the central committee. At the last meeting of this body, on the 26th ult., the report of the deputation was presented. It stated that there was nothing in the condition of the existing portion of the tower to prevent its completion, and it was accordingly determined to proceed with the work as soon as practicable.

## WALL PAINTINGS AT POMPEII.

THE Austrian architect, Herr Hansen, who is in the Imperial service, recently discovered the secret of the process of preparation, which lends such brilliancy to the ancient mural paintings of Pompeii. He discovered that the ground is a *stucco lustro* of whitening or chalk, with the dust of marble. The artist Herr Griepenkler, upon the invitation of Herr Hansen, has recently painted upon a ground of this character a picture of a Madonna, using earth-colours. After the picture was finished it was smoothed and polished, and at once presented all the brilliancy of the Pompeian wall-paintings. It has been decided that some of the pictures with which the interior of the new Austrian Reichsrath, or Imperial Parliament Buildings, is to be decorated, shall be executed according to the re-discovered Pompeian process.

## THE LATE MR. DAVID MOCATTA.

ALTHOUGH Mr. David Mocatta had left the profession many years, he still maintained his connexion with various institutions connected with it, and many of our readers will hear with regret of his death, which took place at his residence, 32, Prince's-gate, South Kensington, on Monday, the 1st of May. His death was quite unexpected; we had seen him but a few days previously, when he seemed in his usual health and spirits, and turned over for us some of his numerous folios of water-colour drawings made by him in all parts of Europe. He was born in 1805, and was the son of Moses Mocatta, the translator into English of the well-known work "Faith Strengthened," which originally appeared in Hebrew under the title of *חזקת האמונה*. Making choice of architecture as a profession, he enjoyed the advantage of studying for many years in Italy. On his return to England, he took up his professional activities. He was engaged on several important buildings, and he was frequently employed by the directors of the London Brighton and South Coast Railway. On the death of his father he succeeded to an ample fortune, which was subsequently increased to a considerable extent by property bequeathed to him by his brother Benjamin Mocatta. Although he early retired from his profession, his love for his art never left him. If we remember rightly, his designs for the Royal Exchange stood high in the competition which resulted in the selection of Sir William Tite's design.

Mr. Mocatta was one of the earliest Fellows of the Royal Institute of British Architects, elected 1837, and was elected later a Vice-President. He was also a Fellow of the Society of Antiquaries, and one of the most active promoters and friends of the Architects' Benevolent Society. He was also the senior trustee of Sir John Soane's Museum. In early life he had studied in Soane's office. Amongst his co-religionists he will be greatly missed. We hear that he was one of the original Council of Founders of the West London Synagogue of British Jews, and worked earnestly with his venerable father, Moses Mocatta, to bring that congregation into existence. He was the directing architect of the temporary synagogue in Burton-street; he superintended also the construction of the more enlarged building in Margaret-street; and he was consulted throughout by Messrs. Davis & Emanuel in the erection of the present edifice in Upper Berkeley-street. On the demise of Sir Francis Goldsmid he was unanimously chosen Chairman of the Council of Founders, which post he occupied until his death. The *Jewish Chronicle* says justly:—"There are many reasons for holding in high respect the memory of David Mocatta. Like Basvi, the brother-in-law of Lord Beaconsfield, he adopted the profession of an architect at a time when few Jews followed professional careers, and, like the late Solomon Alexander Hart, the Royal Academician, he showed that a Jew could have the highest love for artistic studies. He was one of the men whom in the early struggles of Jewish emancipation Sir Isaac Lyon Goldsmid took a pride in pointing out as exhibiting a predilection for other than commercial pursuits. That he was not unsuccessful in his profession is proved by his having been chosen as the architect of the Brighton Railway, and the impressions of his study in Italy are permanently recorded in the handsome viaduct erected near Hayward's Heath from his design." All who knew David Mocatta speak of him as courteous, kind, and honourable, and such we always found him during a long acquaintanceship.



### EDINBURGH ARCHITECTURAL ASSOCIATION.

On Saturday last about sixty members of the Edinburgh Architectural Association, along with the president, Mr. John MacLachlan, paid a visit to the New University Buildings. The party was received by Mr. R. Rowand Anderson, the architect, who pointed out the various external and internal features of the building. At the outset he directed attention to a block plan showing the mode in which the building had been arranged with regard to site, which was very irregular, and, for the accommodation wanted by the University, a very limited one. In passing round the building, he explained that the general arrangement of the building was such as to give each Professor a department to himself. The dissecting-room is the largest in the country. The tall ventilating-shaft exercised a powerful draught on every room in the building. There are no fire-places, with the exception of one or two in the Professors' private rooms, the whole building being heated by hot water. The west end of the court in the centre of the building is formed of the front of what was No. 2, Park Place. Mr. Anderson understood that it was designed by Adams, and said that when it was found to be of the proper height and equal in length to the breadth of the court, out of respect to the memory of Adams he thought they could not do better than utilise it.

On the motion of the President of the Association, Mr. Anderson received a hearty vote of thanks for the kindness he had shown in connexion with the visit.

### LONGLEAT.

There are few buildings, if any, in this country which possess such an especial interest from their connexion with the history of the revival of Classical architecture as does Longleat House, the residence of the Most Noble the Marquis of Bath. It has been ascertained, almost beyond doubt, that Longleat is the earliest building in the Renaissance style at present existing in this country, and we only know for certain of one erection of any importance having preceded it in point of date, and that was the first Somerset House, erected from the designs of John of Padua, by the Lord Protector Somerset, during the reign of Edward VI. There is a traditional connexion between the two houses; for Longleat House has always been ascribed to John of Padua, and there is a very great probability that this tradition is authentic, although unfortunately all documentary evidence is silent upon the subject. The precise date of the commencement of Longleat House is unknown, but it was certainly between 1549 and 1566. Documents still in existence speak of Robert Smithson as "Free mason," and accounts paid to him in 1578 are to be seen at Longleat. He received 1s. 4d. per day, which was considered very high wages for those days; and by some writers it has been suggested that he was the architect of Longleat. He died in 1614, and was buried at Wollerton Church. The epitaph over his grave is quoted by the Rev. J. E. Jackson, in "The History of Longleat,"\* and, singularly enough, it claims for Smithson the distinction of having been "architect and surveyor unto the most worthy house of Wollerton, with divers others of great account." It has always been supposed that John Thorpe was the architect of Wollerton; but, be that as it may, it is quite evident that the man who designed Wollerton could never have designed Longleat, because, although there is a certain resemblance between the two houses, it is a resemblance which springs from a man of very inferior ability copying the works of a much more refined and able architect. Wollerton was commenced in 1580, or some twenty years later than Longleat. The fact is, that no two buildings show a greater divergence of thought than do these two houses: they, in fact, belong to two totally distinct schools of architecture. Longleat depends for its effect upon carefully studied proportions, and exceedingly quiet and severe detail. Whereas Wollerton shows little study of proportion, and gains its effect from a profusion of rather coarse and bold detail. At Longleat the ornamentation is confined to the caps and bases of the pilasters, and the entablature, the shafts being left quite plain,

without either fluting or bands. The friezes are also very slightly ornamented, but at Wollerton the shafts are banded and fluted, and the friezes loaded with ornament.

Smithson's work at Longleat was probably confined to the court-yard elevations and interior of the house. The former are quite of the usual type of late sixteenth-century domestic work, crowned with gables, and with the usual form of square-lighted windows; but the three external façades were undoubtedly either designed by some Italian architect, or copied from some work executed by an Italian. We are inclined to believe the first to be the case, and for this reason,—that the lower portion, the basement and the ground-floor, adorned with a Doric order and entablature, are more carefully and more finely executed than the next story, which is adorned with Ionic pilasters and entablature, and the uppermost story of all, which is Corinthian, is far poorer than either of the two lower ones. Now, if the house had been copied from some already existing edifice, the workmen would have improved in the art as they went on, and from continual study would have become more and more Classical in their detail; but if we suppose that the work was commenced under the supervision of an Italian architect, who left or died by the time the building had got up as high as the ground floor, and that after he was gone the workmen had only his drawings to go by, it would be easy to understand that they would become less and less proficient as they were removed further and further from his influence. That the design of the Italian architect was never totally abandoned seems proved by the flat roof and the stone domes crowning the turrets. These are certainly the earliest domes in England constructed of stone. The principal doorway was an addition by Wren, and is skillfully designed. The only portion of the interior which is in its original state is the great hall. It is a good example of Jacobean architecture, but totally unlike the façades. Many of the reception-rooms which had been reconstructed by Wyatt have been rebuilt in a very handsome manner by the present marquis. Most of the doorways, mantelpieces, &c., have been brought over from Italy, and the ceilings have been decorated by Mr. Crace, jun.

### A GOTHIC FRONT WITHOUT MULLIONS.

The question of mullions in window has, I see, again arisen amongst architectural disputants and advocates of novelty. Exactly twenty years ago, when the "Battle of the Styles" was raging furiously, the drawing you now insert was made to show the effect of Gothic without mullions, retaining the tracery, and using plate-glass sashes. How far the attempt was successfully carried out on paper by the author is shown; it may be chiefly interesting as an endeavour by a young hand to turn out something approaching originality. There are some glaring defects,—the breaking through of the main cornice especially. However, some bold and bold effects might be obtained by skilful hands, especially if my idea of combining different phases of Gothic were adopted.

The drawing, as will be seen, was made when crinoline flourished and was considered beautiful, if not "a joy for ever."

MARTIN UNDERWOOD.

### NEW PUBLIC HALL, MIDHURST.

The building of which we give an illustration to-day was opened on the 15th of February last. It is built of local bricks, and faced with Bracknell red facing bricks, with moulded brick cornices, labels, strings, &c. Bath stone being sparingly used for caps and piers, keystones, and dressings to the front. The roof is open to the collars, and is constructed on the hammer-beam principle, having a span of 45 ft., the spandrels being filled in with ornamental wood tracery, and the whole stained and varnished. The under-side of the rafters and collars are coiled, gas pendants are attached to the tie-beams, and above the collars a ventilating shaft for the extraction of foul air runs the whole length of the hall, with exit in the roof of the tower.

The building consists of a large hall, 80 ft. by 45 ft., with a platform 15 ft. wide at the end, and retiring-rooms, &c., attached. The principal entrance leads into a corridor 10 ft. wide, which extends the entire width of the building, and communicates with a corridor on each side. The

hall is capable of seating 450 persons, and the gallery, which occupies three sides of the hall over the corridor, will seat 250 more, making a total accommodation for 700 persons. The platform can be removed so as to form a clear space when required on the occasion of a public ball. Under the platform there is a store for chairs, &c., and storage space, with access at the side, is provided under the large hall. There is a principal entrance, to be used as a lending-library and reading-room, with committee-rooms over, and rooms for the custodian in the basement. The total cost of the building will be about 3,400l. The contractor is Mr. George Sharp, of Horsham; and the architect is Mr. William Buck, of Horsham.

### HIGH SCHOOL FOR GIRLS, SOUTH HAMPSHIRE.

OPENING BY THE PRINCESS LOUISE.

THIS Saturday, the 13th inst., the twenty-fourth school established by the Girls' Public Day Schools Company, will be opened by the Princess Louise (who takes a special personal interest in the development of all institutions having for their object the higher education of women).

The South Hampshire School is a new building erected from the designs and under the superintendence of Mr. E. C. Robins, F.S.A., architect, and occupies a site in Maresfield-gardens, at the foot of the Fitzjohn-avenue. This school was originally entitled the St. John's Wood High School, and has occupied a pair of houses in Winchester-road since 1876, which it has outgrown, under the able management of Miss Allen Olney, the head-mistress. On the falling out of the lease, the new school was begun upon the above freehold site. Accommodation is provided for 275 pupils, with provision for future enlargement if required. It has a comely frontage, and is faced on all sides with red bricks and red terra-cotta dressings, with green slated roof.

The building is in what is commonly termed, the Queen Anne style, and it comprises a good hall, 56 ft. long by 30 ft. wide and 30 ft. high, into which six class-rooms open on one side,—three on the ground-floor and three on the first floor,—the entrance corridor to the upper series forming a gallery to the hall, which is another example of the "hall passage" system, of planning advocated by its architect. Below these class-rooms on the basement floor are the cloak-rooms, and under the fireproof floor of the hall is a covered playground; the tennis and five-courts are not yet completed.

The axis of these buildings is at right angles with the front block, containing four stories. The attic story has a large class-room and the caretaker's apartments.

The first floor has two large and one small class-room with mistress's lavatory.

The ground-floor has one large class-room, the head mistress's room, the office and waiting-room, the teachers' room, and lavatory adjoining it.

The chief entrance and vestibule opens into the main corridor, opposite the entrance to the large hall. The stone staircase adjoins it, and is continued down to the basement. The girls' entrance is under the chief entrance, and after passing through the cloak-rooms they ascend the principal staircase, and enter the hall, where all meet for prayers before marching off to their several class-rooms. In the basement are a chemical laboratory, with sink and fume closet; a large lavatory and conveniences, a dining-hall, kitchen and scullery, and offices and stores for food and fuel.

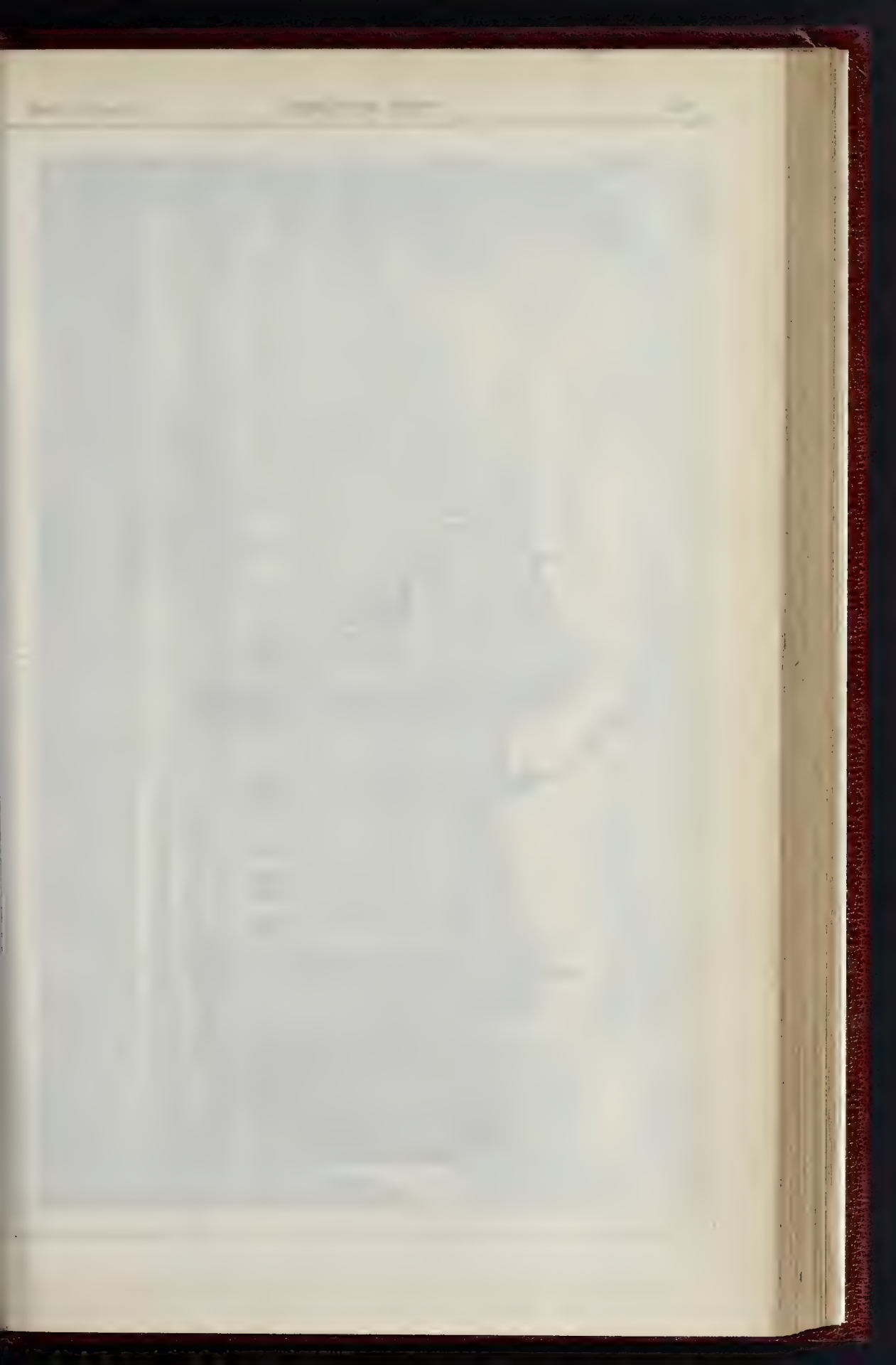
The hall and corridors are heated with hot-water piping and coils, the rooms with hygienic stoves, the fresh air being warmed in its passage through them, and which enters the room in a vertical current. Heated extract-shafts withdraw the vitiated atmosphere in every apartment, and in summer, or between the classes, through ventilation is obtainable everywhere by opening the windows. A left-hand light is provided for all class-rooms, with Swedish desks.

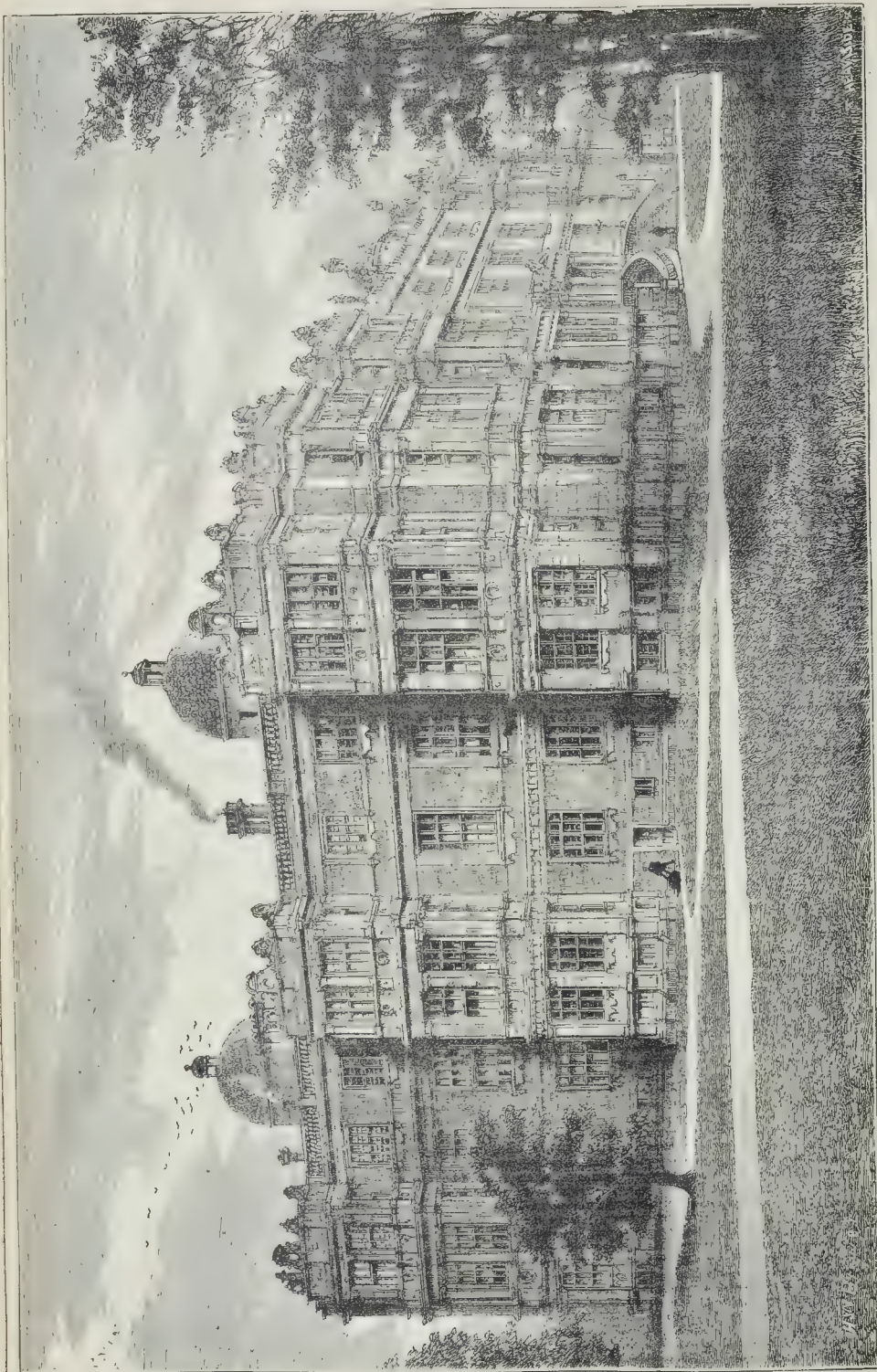
The contract has been satisfactorily executed by Messrs. Colls, whose tender was about 7,000l.

**Surveyorship.**—Mr. George R. Welby Wheeler, at present assistant-surveyor to the vestry of St. Mary Abbots, Kensington, has been appointed surveyor to the Westminster Board of Works. There were 101 candidates.

\* The History of Longleat. By the Rev. J. E. Jackson, Rector of Leigh, Delamere, Wilts; Hon. Canon of Bristol; and Rural Dean of Malmesbury. F. & E. Ball, Devizes. 1895.

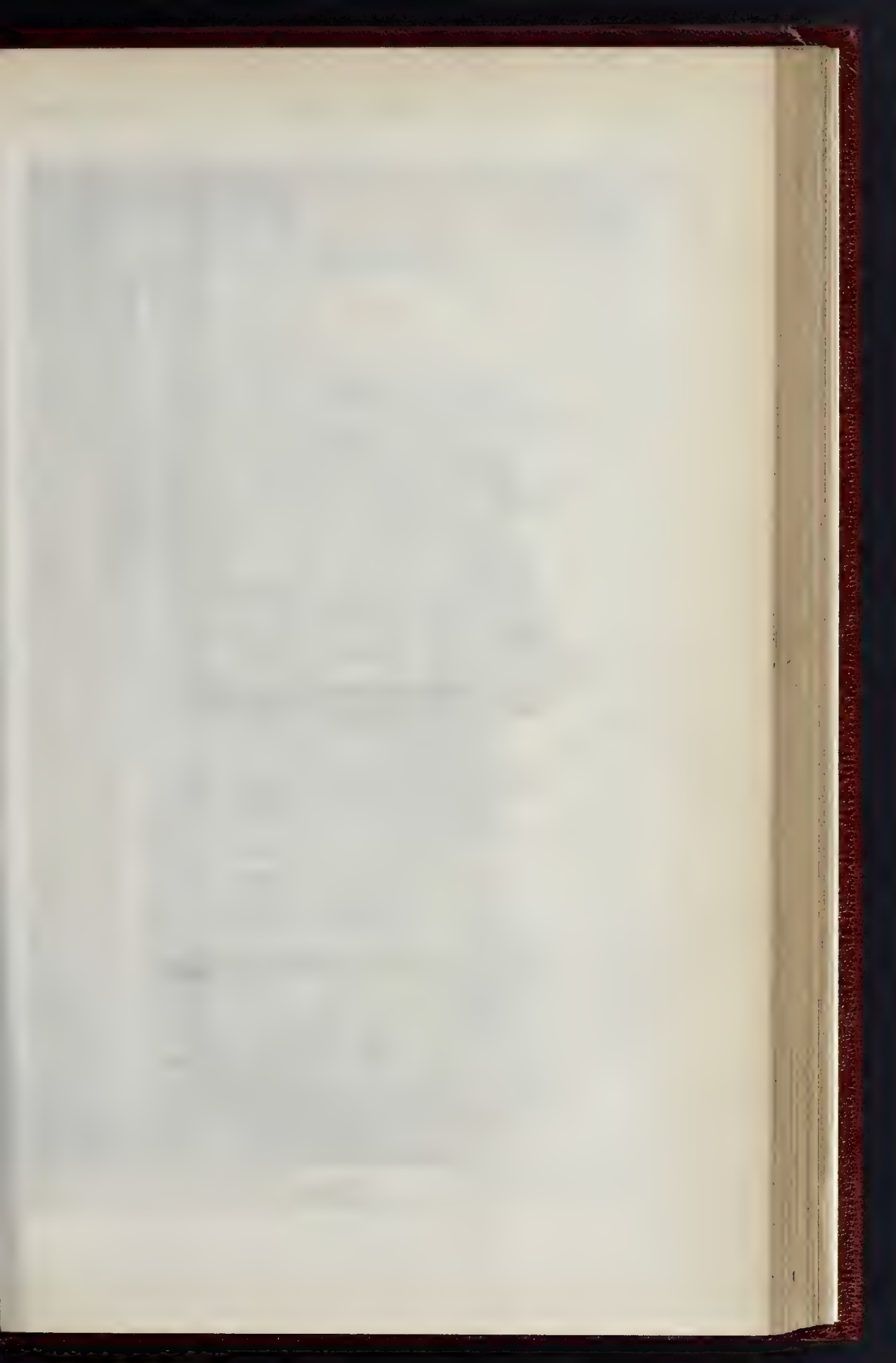




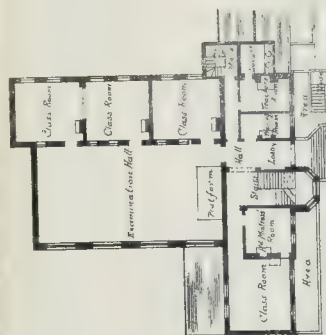


LONGLEAT.





THE CHURCHMAN MAY 13, 1882

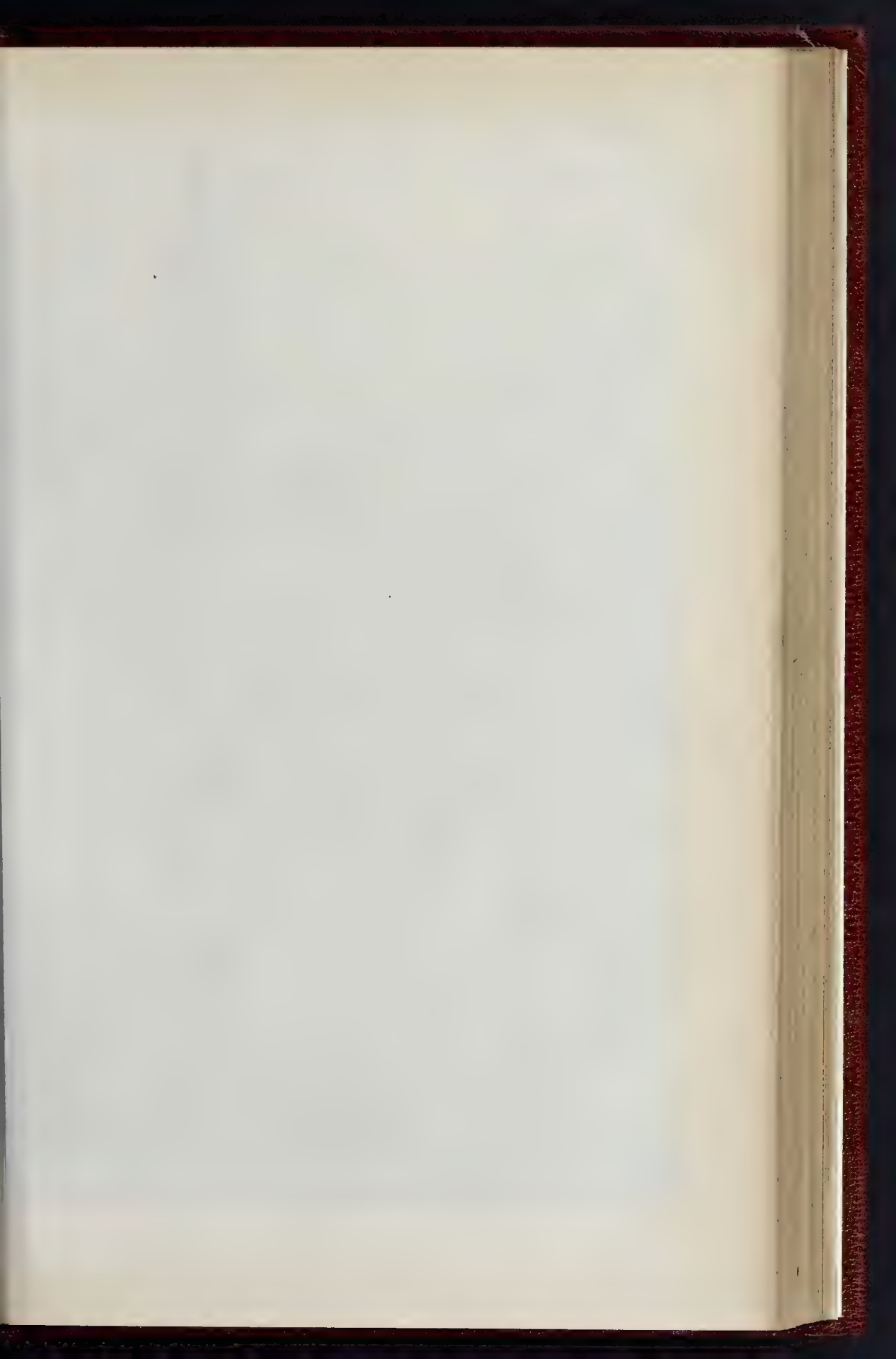


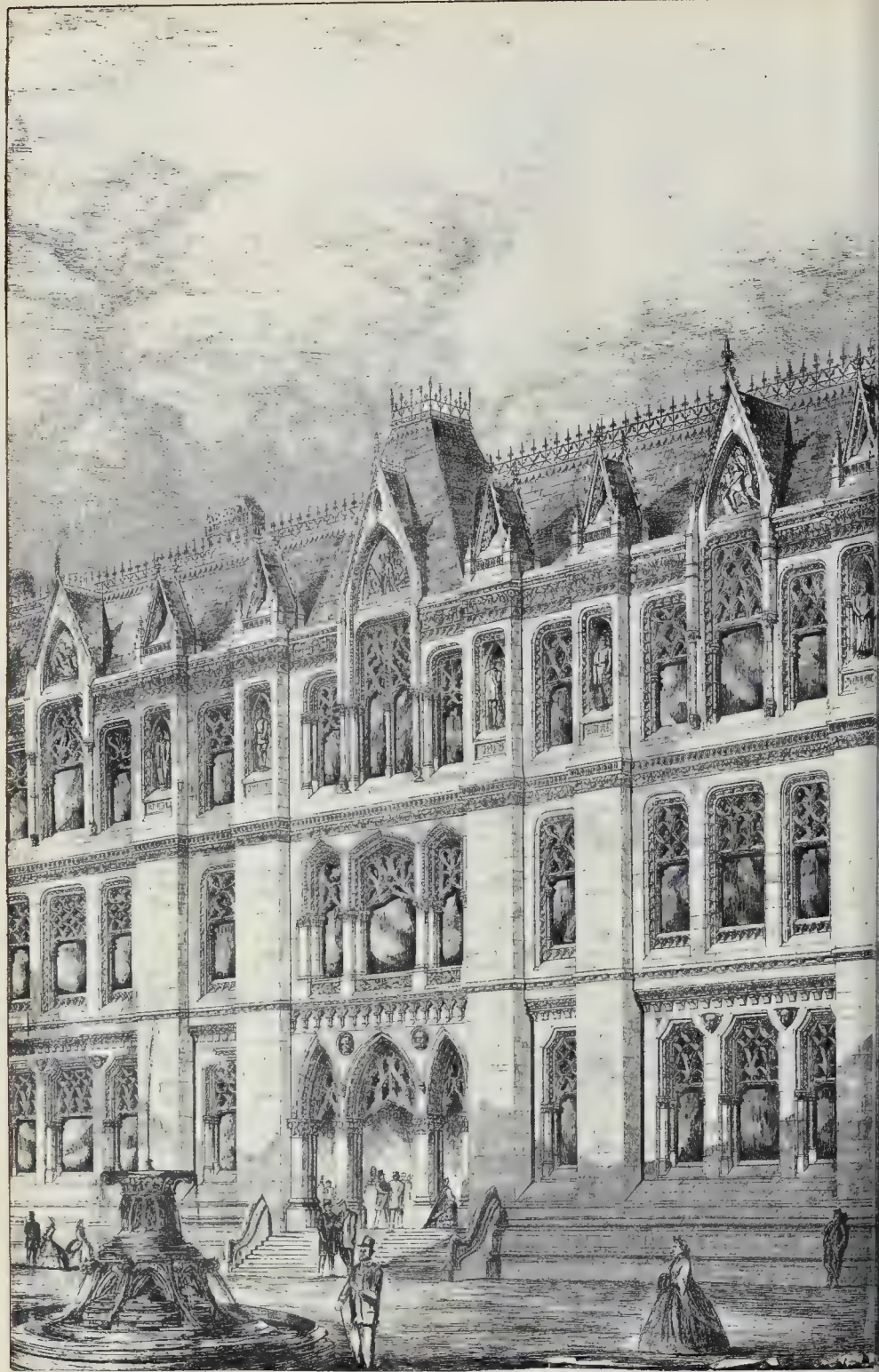
Ground Plan



High School for Girls, St. John's Wood Branch Edward C. Robbins, F.S.A. Archt.







W. H. R. 1852

TENTATIVE DESIGN: GOTHIC WINDOWS

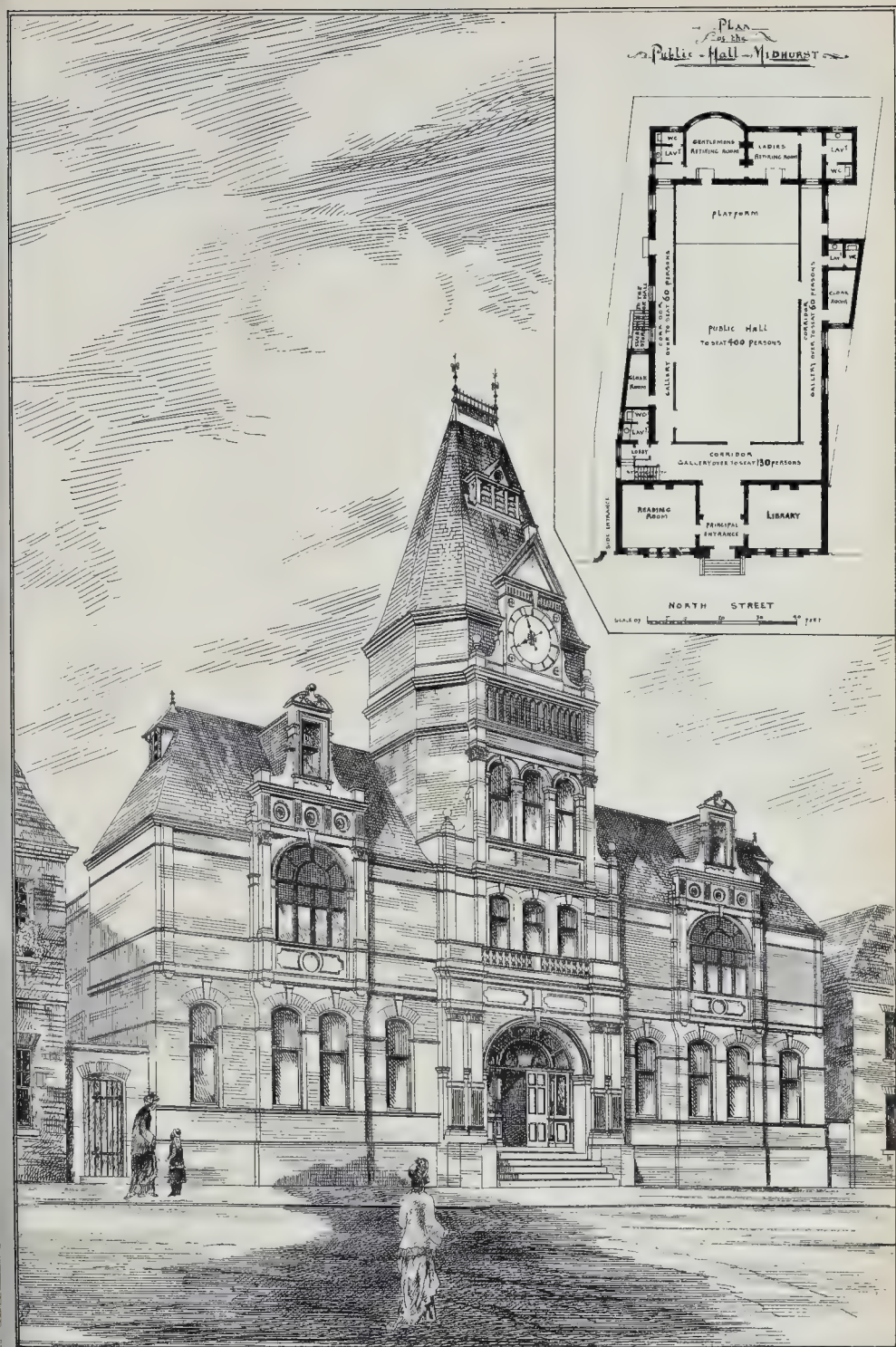




LIONS.—DESIGNED BY MR. M. UNDERWOOD







Whiteman & Bann Photo Lichs 236 High Holborn

Wyman & Sons Printers Gt Queen St

**PUBLIC HALL, MIDHURST.**  
WILLIAM BUCK, ARCHITECT, HORSHAM.





## COLOURED DECORATIONS.\*

ALTHOUGH the time employed in writing this paper has been hard to spare, I could not refuse to give it, because you are the architects of the immediate future. It depends on you whether English architecture is to rise or fall; whether it is to be wise and good, or bad and foolish; so, if I have any knowledge that can be imparted, any just views that can be displayed, or any enthusiasm that can kindle, I feel that no personal consideration should prevent me from making you my heirs.—“Be niggards of advice on no pretence; for the worst avarice is that of sense.”

I had rather have had my say on architecture, but you willed it otherwise. When I began this I began by digressing, but thinking of Addison's remark on Montaigne, I abstained. Addison says, if a jackass is put into a pound for straying, why should an author be allowed to stray without punishment? So I try and stick to my text of something about colour and decoration.

London is so sunless, so dusty, so grimy, and so generally unlovely, that anything that can be done to render it cleaner and more interesting is beneficial to health, mind, and temper. Again, architects are now in number like the sands of the sea, and we all know that it is an underpaid and undervalued profession; so that if any fresh opening can be made, and if any more interesting work can be started, some members at least will be doubly benefited; and I may add a third and very important consideration: when man-made or natural coloured woods are employed, it behoves an architect to know something about colour. He can hardly delegate the choice to another: to do so presupposes that after the whole design is made, and before any building is begun, the whole scheme of decoration must be settled and completed; and, beyond this, if he have no knowledge of colour, his building may be spoiled by bad colouring, or he may find that what he wants to be prominent is subdued, and what he wants subdued is prominent.

Colour is as capable as form of being dignified or trivial, of suggesting the use of the room or building to which it is applied. And then, too, each profession,—nay, each branch of any profession,—is so absorbing and so transcendental that none but the most powerful capacities can take the requirements of kindred and allied arts. The best painter or the best sculptor may be ignorant or careless of the effect of his particular work on a room or a building, provided the picture he paints or the statue he carves is perfect in itself; and though, in my opinion, the architect is bound to make his room, hall, or building lead up to the masterpiece of the sister arts, if his building has been intended for that purpose, yet a carefully-elaborated decoration, especially if in natural coloured woods, marbles, and mosaic, is not to be spoiled by the introduction of a large mass of raw white, or by a very dark blot, however excellent the works may be in themselves. If, therefore, you design permanent decoration for the inside of a church, you must allow for the erection of slabs and monuments of white marble, and in most rooms you must look for the possible addition of pictures, and therefore the colours adopted should be so arranged that the pictures are not ruined by the room nor the room by the pictures. In rooms specially designed to receive oil pictures this fact should be borne in mind,—that by age the whites in oil paintings become yellow; the colouring of the room must, therefore, be so arranged as to modify or counteract that tendency in the oil paintings to become rancid; warm greys, warm tertiary greens, and warm reds are mostly suitable.

In Science, the separate phenomena have been brought within a law: if the law is known the extraordinary person can treat the phenomena at once under it as well as the greatest genius; in Art it is science of which the laws are not yet discovered, and the utmost that can be taught is the recipe for certain cases; but as Science itself leaves ample scope for invention, so much more does Art, and though you had every own recipe for harmony of colour ready in your memory, there would be ample room for your inventions. Colour is a gift as well as a passion, and, like all other gifts, it must be judiciously cultivated if it is to bear agreeable fruit. It is said, I know not with what truth, that every apple has come from the crab, and must all admit that the flavour of a Ribston Pippin, or New Town pippin, or a gelone of

Naples is very superior in flavour to the original stock.

You must go to nature if you want to cultivate a taste for colour, and it is perhaps doubtful if you can get beyond it, if your works are to be lovely and harmonious. The sky alone is a field of infinite study for certain harmonies, viz., the pure shaded blue with the white or gold of the sun, with the white and grey of the clouds; the white sky with the greys of clouds; the deep blue of night with the red, golden, or silver of the moon, the gold of the stars, and the white, dark grey, or black of the clouds; the yellow or deep crimson of the sun at sunrise or sunset, with the pale yellow, pale greens, pale blues, and pale anethyst of the sky, and with the greys, the purples, and the browns of the clouds. The sea, the rivers, the lakes, and the ocean all provide you with colour studies of infinite variety. In the landscape, again, you have endless varieties, and almost every variety is beautiful, awe-striking, or sublime, and in distant wooded hills or in distant mountains you have the most lovely and most mysterious harmonies. Man's utmost efforts can but enable him to fix some small bit of this beauty for future delight, and this fixing is but a weak and poor paraphrase of the reality. For truly we have not nature's palette nor her infinite and microscopic means in our hands, so that the masterpiece of the greatest genius that ever painted landscape has been to him in execution but a sort of enthralling agony and despair while he was trying to seize one evanescent beauty of nature; but for our purpose we do not want to copy the landscape, but merely to get some agreeable and, if possible, some new harmony that may be judiciously applied in our work.

Even when we study what are looked upon as the easy and simple harmonies of nature, those that are found in flowers, in birds, in fish, in animals, and in insects, where we have them under our steady light and elude all the mysteries of distance, we find we are but little better off. These smaller beauties are as impossible to portray as the grand ones, yet the worst amateurs that ever daubed a landscape or spoiled a flower has gained a higher step in taste than one who has never tried.

From a boy I have loved colour like a bee, for you know that flowers bloom not to delight us, but to attract the bees, the butterflies, and the insects, and possibly to please one another; the Shakers in America, at least, found that some fruit-trees loved to be near coloured flowers, and some near scented ones.

When I grew up, and tried to study colour, I found there was almost nothing known about it, and I suddenly thought me that the laws of harmony were to be extracted from the observation of flowers, birds, butterflies, and fish,—and we do get some sort of rough idea; but the mass, the shape, the modelling, the texture, to vary the colour, tint, and tone, that the residuum seems to be that every colour will harmonise with every other if you can get the proper tint, tone, and quantity. You see in the plumage of birds, to name the harmonies with black alone, black and white, black and grey, black and brown, black and yellow, black and orange, black and red, black and violet, black and green; only to be of use you must know the tones and the tints, and the quantity of each. In flowers you know every colour harmonises with green, but you want to know what the tones and tints of the two colours are, and their quantities too.

Green and white is not very common in the petals of a flower, though we have it in the snowdrop, but it is a very common harmony between flowers and their leaves, the chickweed, the stellaria, the lady's smock (though that is more often of a very pale violet), the hemlock and the meadow-sweet, the white azalea, the pear blossom, the magnolia and the gardenia, the jasmine, the clematis, the white geranium, the camellia, the white lily and the lily of the valley, the white hyacinth, the white lilac, the pea and bean, and the white thorn; but it would be endless to enumerate the commoner white flowers, even if I knew them all. In many flowers the pistils or stamens are of the complementary colours to the petals, so as to heighten their brilliancy; and sometimes, apparently for the same reason, a spot of complementary colour is put on the petals. I now forget which it is, but either in the flower of the meadow-sweet or in that of the hemlock, which, as you know, is composed of hundreds of flowers massed together so as to look like one large flower, some of the central flowers are black, or a very

dark purple, when the plant is in full bloom. I merely mention these means of improving your taste in colour, and acquainting your eye to seize on harmonies, for the mere copying and transplanting of natural flowers on to a wall or a piece of furniture is not decoration.

In all the arts, except in the purely imitative arts, the natural objects must pass through the alembic of man's mind, and if flowers and foliage are used in their natural forms, they must be symmetrically or geometrically arranged, and have, as a rule, arbitrary colours, though, if they be geometrically arranged on some arbitrarily coloured ground, they may sometimes form a very beautiful decoration.

In the copy of the Indian embroidery before you, you see flowers and leaves and stalks in what might be their native colours, but in geometrical forms and on a black ground, and many varieties of flowers spring from the same stalk. And, again, certain marked pieces, as the sprays beside the pines, have alternately on each branch white flowers on a red stalk, and red flowers on a white one. Two plants I have seen might have made superb decoration, and have only been arranged, viz., a dead and dried mare's-tail, which was like silver and black with deep brown intermingled; and a shrub I once saw in a gold drawing-room. It had a sort of dull greenish-black stalk, with small dark green leaves, and a spherical flower of pale yellow hairs; if this had been painted on the gold it would have made a most lovely decoration.

The Arabs,—for whether they were Greeks, Persians, Romans, or Barbarians, when people are conquered they go by the name of their conquerors,—used natural flowers in their tiles, sometimes with and sometimes without a trellis, but always geometrically arranged; but they coloured them arbitrarily, and though but about seven colours were used, they made the most superb decorations. The colours used were mainly a white, a light and a dark green, an azure, a dark indigo blue, a black, and a purple, though in some places where this purple was not to be had, a coarse red was used in its place, but with very bad effect.

Mr. Ruskin once said of ornament that it was like men to a general,—he could not have too many if he knew what to do with them,—and this may be most truly said of colour; but as the general, if he be a genius, may make a most splendid defence with a few men, so a genius in colour may produce a beautiful effect with a very few of the most unpromising colours.

I beg to draw your attention to a copy of a piece of Levantine embroidery on coarse brown linen stuff worked with large vigorous flowers in gold thread, with silver thread centres; the only other colours employed are a dark one for edging, a pale yellow, and two tones of fawn, yet anything more lovely it is difficult to imagine.

To the East we must go if we want examples of daring colour, and if we want to learn by example what colours harmonise with deep and splendidly coloured grounds.

I will next draw your attention to a small copy of old Chinese embroidery on a crimson ground. You may notice in the angles that there is a zigzag line of blue. This becomes almost black where it touches the crimson, and the light edge is separated from the crimson by gold, and the warm white flower in the middle is parti-coloured with an orange-brown. The design of the circular portions is most superb, formed by the outer wing-feathers of the bird, the whole of the wing-feather being opened as you see birds when pleased will open them. This superb design is a favourite one, as I have seen it repeated on some plates belonging to Sir F. Leighton, only the plate has a white ground, hatched with blue on the edges, amongst which are gold-fish.

Another very lovely piece is also old Chinese, embroidered in silk, on coarse brown woolen. In the original this embroidery shone like jewels.

I would also call your attention to a drawing of a sumptuous Japanese lacquer tray, in which a peacock and peahen are displaying the green side of their feathers, on a rich crimson-brown ground, only the eyes of the peacock's tail are gold instead of blue.

I will only call your attention to one other piece of Japanese embroidery, the centre of which is embroidered in silk, on a dark blue cotton ground. The middle panel has a pale blue ground, worked over with fine white divisions, with an orange-brown mane, and parti-coloured tartan clouds. This panel is surrounded by three borders, the two outer ones being equal.

\* A paper by Mr. George Atchison, A.R.A., read before the Architectural Association on the 5th inst.



The outer border has white peonies, with green, blue, and fawn-coloured leaves. The border next this is more closely filled with orange-red peonies, with large leaves, mainly of bright warm greens, while the inner border, next the centre, is filled with delicate green foliage, with a few red and yellow flowers. It seems to me to be not only beautiful in colour, but most admirably disposed in point of weight. The blue ginn makes the central attraction, and the dark-blue ground is left more undisturbed than any of the borders. The next border is of less weight. The quantity of red in the next is so full that it almost gives a maroon tone to the border; while the outer border, with the white peonies, has a sort of half-tremulous effect of large and small light flowers, that repeat, on a small scale, the light centre.

If any of you have a passion for colour, it will be a delight if you can see a beautifully-coloured room or a beautifully-coloured building; and, if in addition to that passion, you have a gift, you will be thankful to have occasion for its exercise. Think with what pleasure you recall the few beautifully-coloured rooms, buildings, or even smaller objects you have seen, and resolve not to let a gift so rare perish for want of using.

I will say a little more on the application of colour, though I fear that the remarks will be of the vaguest.

In dwelling-houses we mostly have some keynote. The boudoir is the temple of the lady of the house, and we want, in one way or another, to make it a setting for her: her hair and complexion are there to be shown to the best advantage, or her figure, if it be beautiful or striking, is to be emphasised, or any excess or defect made less palpable; if she be beautifully pale she wants a dark setting, but if she desires to look less pale we choose a colour such as green, which by simultaneous contrast will give her a warmer tint; if too ruddy, some red will help to subdue it, by its green simultaneous contrast.

A dining-room must not be too light, and it must not be sepulchral, but of some soft, warm, pleasant colour. If a natural coloured wood is used for dados, or panelling, it confines your colours to those that will harmonise with it. Again, if pictures are to be hung, then the room must form a suitable background for them.

Drawing-rooms, again, when they are not picture-galleries, are for assemblies, and mainly for artificial light; and the wall must be made of a suitable colour for a background to the company.

Where rooms are fully,—and by fully I mean deeply,—coloured, nothing is so dignified for furniture, and accessories such as cabinets, mirror-frames, &c., as black, and if the mass be too preponderating, ivory inlay is a great help; but in very light rooms the furniture must be of light-coloured woods, or painted.

There is a prevalent fault I would beseech you to avoid; it is, if I may be allowed the use of the word, "stuffy" decoration. There is a sort of skill displayed in the conjunction of dull-greens, dull-browns, dull-reds, and dull-blacks that produces the effect on one of breathing need-up air; the instant you come into a room decorated in this wise you gasp for breath; and you may readily get the prescription by a careful study of modern carpets and table covers.

They say that if you favour with spirits everything a man eats, he will become a testotaller; perhaps they mix red with all the colours. How it is got I know not, but I know the effect. If you were always in a house so decorated you would forever colour.

In magnificent halls or churches, where marble and mosaic are used, there is great difficulty in preventing blackness or spottiness where full colour is desired, and the light marbles alone are not only too cold, but are too light for the mosaic above.

As regards the subjects in decoration, at present people love nothing; it is, therefore, impossible to give advice.

Some years ago I noticed at Berlin a new palace that was just done, the face of compressed tiles in geometrical patterns, the window dressings in coloured terra-cotta, and the frieze in glass mosaic on a gold ground. It was not particularly successful; but when one considered that the tiles and terra-cotta probably came from England, and that the mosaic was made by the English company at Venice, it seemed rather hard as well as strange that no one had tried such materials here, where the soot and dust hang like a pall on our buildings,

and where a little more cheerfulness and light would be so acceptable in our useless cities.

Older men than you can recollect Venice, when the remains of outside painting were still to be seen, and all can see what it was like in the pictures of Carpaccio; and now at Brescia there are houses covered with figure frescoes in colour, which, though perishing, show that their style was grand. It seems to me that it would be a great boon in every way if our shops and houses were covered with painted tiles or painted bricks. Mr. De Morgan, the celebrated potter, says that it is quite possible to make tiles that will stand our climate. White tiles, as you all know, have been almost abandoned for outside work, as they so rapidly perish. It is useless to compare Persia with England, but there their domes and buildings are mostly covered with inland tiles.

I have often wondered that no owner of a shop has adopted coloured ornament in tiles or bricks, even if it were but for the sake of advertisement, and its adoption would certainly tend to health and cleanliness. And there seems no reason why it should not tend to beauty as well. Hitherto our outside mosaics have not been very successful as objects of beauty, nor do I know how they have withstood the climate; but if they will stand the climate there is no reason why they should not be beautiful.

Some time ago there was a suggestion to cover our houses with polished granite, but I have not seen that it has been put largely into practice.

Nothing more beautiful than the crumbling marble outside St. Mark's could be seen. I say could, for they have recessed the north and south fronts; but here we must have some polished material that will resist the action of our damp atmosphere charged with sulphuric acid, and it must be often cleaned to remove the soot and dust.

I believe nothing will resist the atmosphere of London, and of the large manufacturing towns, but granite, porphyry, and bronze. Whether among these materials enough of light colour can be got, I do not know; but the dark granites are apt to make a building too sombre. Nothing gives a more pleasing effect to the outside of a building than a slight suggestion of colour.

When you come to London from some better climate on a damp sunless day, and see it with its murky air, its grim and grimy buildings, you are apt to be reminded of Dante's city with the inscription,—

"All hope abandon ye who enter here."

Gentlemen, it is for you to try and remove this stain from the great city of your birth or of your adoption.

Mr. Aitchison's paper was illustrated by a large number of studies in colour made by him (many of them twenty-five or thirty years ago) from flowers, birds, and other natural objects; also by Oriental tiles and representations of embroidery. In references to many of these illustrations, he made a great many interesting *vinz voce* observations by way of supplement to the paper which we have printed.

Mr. Stannus, in proposing a vote of thanks to Mr. Aitchison, said he had been very much struck by that gentleman's remarks as to the subtlety of the means which seemed to be employed in Nature to bring about an infinity of beauty in colour, and he trusted that those remarks,—evidently the result of close observation and study,—would induce his hearers to go to Nature, and learn of her. He was very pleased at the reference made to Mr. De Morgan, the interesting potter of Chelsea, who seemed to combine the enthusiasm of Palissy with the chemical researches of modern men, and that combination had resulted in some very valuable discoveries. As to the frescoes at Brescia, faded as they might be, they conveyed to his mind, when he last saw them, a wonderful sense of beauty of colour, and he was not certain whether they did not look better than when first painted.

Mr. Sydney Vacher seconded the motion. The Chairman (Mr. L. C. Riddett, vice-president), in putting the motion, said it was certainly matter for congratulation that colour decoration occupied a very different position now in the work of the architect to that which it occupied within the memory of many of those to whom he was speaking. He was not too young to remember perfectly well the state of colour decoration in 1851,—the year of the Great

Exhibition. In that building the blue and white with which the ironwork was painted, and the scarlet draperies, were the only attempt at decoration. The Exhibition building of 1862, in the chromatic arrangement of the roof-ribs and in other parts of the building, showed a marked advance in respect of colour decoration, thanks to the teaching of Owen Jones and Sir Digby Wyatt. Young architects would do well to make the subject of colour decoration a study for the public taste was advancing, and they were likely to be more and more frequently called upon to execute such work. The study of colour decoration might, he thought, be very advantageously taken up by very many ladies in preference to music. One point suggested by Mr. Aitchison's paper was the difficulty experienced by many architects in getting the workmen to mix the exact colour that was wanted.

Mr. Aitchison, in the course of some concluding remarks, gave an amusing account of the difficulty he once experienced in getting a foreman painter to work to his directions. The man interposed all sorts of difficulties, and made all kinds of excuses for not doing the work in the way he was desired, until at last the real reason was disclosed by him. "Well, sir, if *could* be done, but I can't see how you can expect me to do it, for I have a reputation to lose!" He went on to say that if the work as he was required to have it done was known to be done under his supervision he should get a name for allowing work to be done in an unworkmanlike manner. However, being indemnified by Mr. Aitchison against any such possible consequences in the case in question, the work was eventually executed in the required manner.

#### ON SANITARY SURVEYING.

At the end of last month a paper on this subject was read at the Surveyors' Institution by Mr. Howard Martin, Mr. E. Ryde, President, in the chair. At the close of the paper,

Mr. T. Chafield Clarke said he thought the members might congratulate themselves on the very practical and very modest paper just read. One passage near its commencement struck him as confirmatory of this estimate of the paper,—the passage in which the author stated that it seemed to him "very desirable that surveyors should avoid pressing on their clients counsels of perfection." This was a prudent and wise suggestion, because with the prevailing rage for what was called sanitary science, clients were often advised to go to a wholly unnecessary expense,—as much as 600*l.* or 800*l.*, and such like sums, in altering the drawings and sanitary arrangements of a house, whereas, by the expenditure of a much less sum, the work might have been adequately done. The result was that people were in a measure debarred from undertaking what was often very necessary by fear of the cost. Now, it was a most curious thing (confirming what Mr. Martin had said), how very little, even at the present moment, many people understood about the ordinary healthy requirements of a house. It was his (Mr. Clarke's) duty only last Saturday to look at a house in the suburbs of London, with a rental of more than 400*l.* per year, where the main water-closets were not ventilated to the outer air at all, and had no windows, and where the sanitary sink went directly into a cesspool with no ventilation whatever. All the other sanitary arrangements of the house were of a similar character. There was one remark he wished to make without dealing with the details of the paper, which it was impossible to do without that careful consideration which it demanded, and that was as to the practice of providing "water-waste preventers" for closets and urinals. These waste preventers were causing universal dissatisfaction. They did not give an adequate flush of water, and the sooner a more efficient mode of flushing and supply was adopted, the better. No doubt the idea that the house cisterns or the feed cisterns that supply closets should be unconnected with each other was perfectly correct, but experience proved that a larger flush of water was required, without waiting for the fresh supply into the water-waste preventer. The laying bare and ripping open of finished work was one of the greatest practical difficulties that surveyors had to contend with. No difficulty of the kind, however, need arise in connexion with the drains of new houses, for no doubt it had been Mr. Martin's practice, as it had been the practice of most



surveyors, to take care that no drains were covered up until they were thoroughly inspected by the architect or the clerk of the works, and this seemed to him (Mr. Clarke) one of the cardinal points to be observed in the construction of houses.

Mr. H. H. Collins had hoped that the paper would have dealt a little more with the practices of sanitary surveying, and a little less with those defects which, as the author had himself admitted, were thoroughly well known and appreciated by most surveyors. What the younger members needed was information which would enable them to trace sanitary defects to their origin, and to recognise insanitary conditions arising from particular circumstances of aspect, locality, and general surroundings. It came pretty much, however, to this, that if people wished to keep their houses clean and healthy, they must exercise constant personal supervision. It had come to be very generally understood in these days that impure air was the cause of most of the diseases properly called zymotic, and he thought that people had, in a great measure, within their own control the means, if not of getting rid of these gases, at least of rendering them innocuous. One most important point to consider was the question of ground-air, a point fully appreciated by the Council of that Institution when engaged, in conjunction with the Royal Institute of British Architects, in the consideration of the by-laws (so long hatching, and which came to be very little after all) proposed by the Metropolitan Board of Works a few years since. Their Institution had, on that occasion, impressed on London builders the absolute necessity of covering the sides of all houses with some impermeable material, such as concrete. This had now become law, but, as he was sorry to say, the mode of carrying it out was a snare and a delusion, the concrete put in being of so inferior a description, that it did not at all answer its purpose. He thought that 9 in. of concrete would be far better than the 6 in. which the by-laws prescribed. This would make a really good covering for the site, and if district-surveyors did their duty by looking to the character of the concrete, it would prevent, in a great measure, the impure ground-air from finding its way into houses. With reference to the remark on the last page of the paper, that "the omitting to pour water into the traps of rain-water gullies near windows, in long-continued dry weather," was a cause of evil, he ventured to think that there should be no gullies of the kind to clear. The traps used at Fitzjohn's-avenue, St. John's Wood, by Messrs. Kelly, the builders, were worth calling attention to. They consisted of a double trap, with a kind of well into which the rain-water pipe descended (simply to prevent it from splashing), and they were so constructed that a man could easily get his hand into them to clean them out. There was a grating on the top of each, and the drain was exposed to the air, the water pouring itself into an open glazed container, which had a P-trap on the other side. It was impossible to have the old-fashioned closet apparatus properly cleaned. Whether it entailed expense or not, the moment a surveyor discovered pan-closets with D-traps he should say at once,—"Before doing anything else, these closets must be taken out of the house." If they remained, all else that was done was useless. These D-traps and containers were simply retorts for the distillation of impure air, which would permeate the house, do what might. After a recent speech on the subject, Mr. Hellyer was very properly twitted by the plumbers present for manufacturing more of these things than of his own patent apparatus, which he recommended so highly; and his answer was, that he was compelled to make them, on account of the public demand for them. Whether a water-closet was planned in the interior of the house, the soil-pipe was bound to be carried down inside, and, where this was the case, it could be the cheapest thing in the end, whatever the immediate cost, to remove the water-closet to place it elsewhere, so that it had external ventilation. He could not agree with Mr. Martin's view that "a surveyor should trust to nothing but the evidence of his own senses." In making sanitary surveys, the apparent evidence of the senses was most misleading, as was constantly proved in practice. In the great majority of cases, defects afforded no evidence to the senses, could only be detected by an intelligent discrimination of sanitary and insanitary conditions. He agreed with what Mr. Chatfield Clarke said with reference to water-waste pre-

venters, and had long since expressed similar views. One form of waste-preventer which he had used, and which might be employed successfully, was Mr. Field's syphon with a 1½-in. supply-pipe to the closet. This syphon, applied to a water-closet, and regulated so as to discharge itself at stated periods, rendered it independent of the action, so often neglected, of pulling up the plug. He, himself, had no traps to the water-closets in his own house. The excreta was discharged at once into the open air, and, though the point at which the discharge took place was awkwardly situated near the door to which the tradesmen came, he had heard no complaint. The soil discharge-pipe was open at the top and the bottom, and thus a current of air was constantly passing through it, and this was all that was necessary to ensure hygienic conditions. As regarded what had been denominated the "crimes" committed by speculative builders, three things were wanted: a little more legislation, not too much—a good deal of punishment when the "crime" was discovered; and a thorough education of those who had to detect and to rectify the evils that existed.

Mr. Clarke said that he had omitted to refer, as he had intended, to the recent death of Mr. George Jennings, who had done so much towards the improvement of sanitary appliances, and who, as the result of his energy and skill, reaped a very large and well-earned reward. He thought that some testimony was due to Mr. Jennings's great public services in connection with the matters under discussion.

Mr. J. W. Poggie said that, although there was nothing particularly new in the paper, the principles enunciated by the author could not be too often brought before the public, for, in spite of the exertions made, very little practical result had been obtained. In the buildings that rose in the suburbs of London by the acre, there was little or no attempt to apply these principles, and sanitarians should, he thought, devote themselves to securing their compulsory adoption; and he agreed with Mr. Collins that, with this view, a little more legislation was necessary. He understood the author of the paper to say that the ventilation at the back of a house might sometimes fail. He supposed he meant by the ventilation at the back a mere relief-pipe, for in perfect ventilation there should always be an inlet as well as an outlet to cause a current of air to move through the drains. The cardinal point in house-drainage was to keep the sewage matters always in motion, so as to insure a continual movement from the house, and a perfect circulation of fresh air in the house-drains and sewers. The remarks made with reference to Dr. Buchanan's arrangement at Croydon required a little correction. It was not originated by Dr. Buchanan, but by Mr. Rogers Field. The mode of carrying up ventilation-pipes was a very important point, because a pipe cranked round an eaves-gutter might trap itself and check the current which ought to exist in it, and in nine cases out of ten he noticed that soil-pipe ventilators were not taken straight up, but were cranked round in this unsatisfactory manner. It had been said that counsels of perfection were undesirable, but he would only say that it was a most unsatisfactory thing in house-drainage to go to half measures. To do so would often be to leave the evil unchecked, and in many cases he had himself had to do with, unless every inch of the house-drains had been examined, the basement thoroughly excavated, and the drains taken out, the mere carrying up of a soil-pipe or letting in of fresh air would have done no good whatever. All badly-laid drains were filled with black sludge, and it was useless to attempt to remedy their defects unless it was done thoroughly, inch by inch.

Mr. A. Payne did not agree that there had been no real advance in sanitary science. The sanitary defects so much referred to were found not so much in houses erected by speculative builders, as in the old houses put up forty or fifty years ago. He once surveyed a house in Kensington, some forty years old, in which all the drains discharged into a cesspool immediately under the drawing-room window, and the overflow-pipe, which passed right through the house into the street, was made of brick. Cases of the kind were rarely met with since the introduction of the modern sewer system, and this being so, it might, he thought, be fairly stated that sanitary science had made very great advance in recent years. As regarded the supply-pipe from the cistern to the water-closet, so long as the supply-pipe was so arranged that it

was kept full of water by placing the tap at the bottom, the danger of contamination to the water was not so great as in the case so often met with, where the tap or plug which allows the water to come out of the cistern is in the cistern itself, being pulled by a string or wire from the closet. Nothing could be more objectionable than this arrangement, and the sanitary surveyor should insist upon its immediate removal; for it was obvious that the pipe passing down from the cistern was charged with foul air, which, when the plug was pulled, would escape into the cistern. It was insisted by Mr. Collins that, where a closet existed in the middle of a house, and there was no window to it, it must be done away with at once. It was all very well to say so, but it was like a doctor insisting that his patient, a man, perhaps, of limited income, must go to Italy, say, for five years. It was not a question of what he should but what he could do. The sanitary surveyor must look at the thing practically, and not act without reference to reasonable possibilities, and without leaving his client an alternative course. It had been his practice to make notes of all defects, and arrange them in order; such and such things as absolutely necessary, and other things as less necessary. One danger which sanitary surveyors must be on the look out for arose from structural alterations in houses. He recently inspected a house in the Buckingham Palace-road, where the rain-water pipes from the flat had been taken down into the drains in the manner that had been mentioned; there was an open pipehead, and some builder, in making additions to the house, had carried the ceiling of a new room over the bare pipehead, thus connecting the sewer with the whole house. It often happened that builders overlooked the real object of concreting the sites of houses. The object of concrete in the foundations of a house was to get strength, and, if the concrete was strong, it answered the purpose; but preventing the ground air from coming up into the house was a different object altogether, and it was not so much strength as impermeability that was required, and the concrete for this purpose should be made up with fine ballast, and be well grouted; its quality could be tested by throwing water down; for unless impervious to water, it could not prevent the damp from rising. Builders would neglect this unless properly looked after.

Mr. C. W. Lee would be glad if Mr. Martin would state whether he knew any instance of the failure of external soil-pipes. He believed that at Kensington, the winter before last, external soil-pipes were frozen up, and the people were left in a shocking state. These pipes were removed subsequently and placed inside the houses again.

Mr. W. Fowler thought it was of little consequence whether people adopted the new means which science had provided, or the old, if this vital principle was kept steadily in view, that ventilation should be outside the house. That was the key-note to the whole question. The miserable circumstances of the illness of the Prince of Wales were fresh in the minds of all. A house, in that instance, was selected, for sanitary reasons, on the top of a hill, open to the air and the breeze; but this very fact did all the mischief. The house being on a hill up which the sewerage system of the town crept, the foul air found its way into the drains, which were without external ventilation, and rendered that house the most unhealthy, which ought to have been the healthiest in the whole town.

Mr. O. K. Bedells said, referring to waste-preventers, that before a good flush of water could be secured something must be done to limit the powers of water companies. The companies would not approve of any apparatus that discharged more than two gallons of water, — an amount sometimes insufficient for the purpose. He had found their requisitions most arbitrary, and such as called for a strong expression of opinion from members of the Institution. The companies' sole aim was to save water, the surveyor's aim to secure a perfect flush, and under these circumstances the companies should not have absolute power to prohibit the best water-waste preventers. Reference had been made to the late Mr. Jennings, who was certainly a pioneer in sanitary reform, especially in regard to plumbers' work; and this brought to his mind a circumstance which illustrated the frequent misuse of very excellent appliances. The case was one where he adopted Mr. Jennings's self-acting water-closet apparatus, but finding it too delicate



and not quite serviceable for the rough usage of workmen in a large printing establishment, Mr. Jennings, with his usual generosity, suggested that the matter should be left to him, and he would put in his "Latrine" apparatus without any considerable additional expense. An improved form of it was accordingly put in throughout the establishment, and when it had been in operation about six months, much to their mortification, that also showed signs of failure. But when the soil-pipe was examined it was found that a pint pewter-pot had been put down it by one of the printer's men, and this was the cause of stoppage. The author had mentioned Dr. Buchanan's trap. There was another which he (Mr. Bedells) had constantly used for the last five or six months, and which he had every reason to be satisfied with. He referred to "Weaver's Ventilating Sewer Air-Trap," which the members had no doubt seen at the recent sanitary and building exhibitions. It acted in the same way as the Buchanan trap in relieving the drain from all sewer-gas by an air-pipe on the sewer side of the trap, and it also admitted air to the house-drains. In a recent case within his experience, serious illness arose in a district where a sewer terminated. At the top of Highgate Archway the sewer did not run across the archway, and at the end of it a great deal of illness occurred, two or three years since, from the fact that the highest point of the sewer was not properly ventilated. When inspecting houses, it would be well for the surveyor not always to confine his attention to the exact house to which he was called. About a month ago, he went carefully over a house close to Belgrave-square, and was leaving, when he happened to look over the parapet of the party-wall, and found a vent pipe discharging at a low level from the adjoining house, and this was the cause of all the mischief. Check damp had been mentioned by the author of the paper, and they were very important. The late Mr. Jennings was, he believed, the inventor of one good form of them, and there had been several others since introduced. The chief feature of them was that they were of glazed stoneware, and therefore absolutely impervious to moisture. The question of ventilated dry areas had also been mentioned in the paper; and he could not too strongly condemn what used to be very common, the small covered dry area about 4 in. wide placed against the external walls. He had in his mind some houses at Kilburn, which he was called in to look at because of dry-rot, and he believed it arose almost entirely from these closed narrow areas. In his judgment, these areas should always be as open as it was possible to get them. The author of the paper had observed that the surveyor should form an independent judgment, and not be misled by what a client or the inhabitant of the house might say. It was a very good thing to make visits of inspection unawares. He had been called in to examine an important house where there had been sickness, and the very means taken by the lady of the house to enable him to detect the defect might have had the opposite result. He was to go on a particular morning, and she had all the windows closed so that the smell in the house might be very apparent to him when he arrived. It so happened that the cause of the smell was an untrapped rain-water pipe of a one-story building, and the shutting up of the windows was the means of preventing him from discovering it for some time. Therefore, as he said, it was a good plan not to go at the exact time fixed, but if possible to make a visit unawares. Internal water-closets had been mentioned, and were certainly most objectionable, and in all new houses to be avoided; he feared, however, it was almost impossible to abolish them altogether just at present in the old ones. Those who had had much experience in London could count them up by the hundred. Where it was hopeless to do away with them altogether, the next best thing was to take care to get proper ventilation for them. He had seen some, where, although the ventilating shafts passed down through two or three floors, precautions were taken which rendered them almost innocuous.

Mr. Howard Martin, in reply, thanked the members for the very kind and indulgent way in which his paper had been received. As he said when he read it, he felt it was impossible to write anything new (and which was also true) on the subject, unless he entered on a discussion of new inventions and fittings, and details of that kind. A question had been asked about the freeing-up of external soil-pipes. He supposed

the thing to be possible, but he had not himself met with an instance. He had removed many from the inside to the outside of houses, but had never known one freeze, and he should say that where this occurred there must be some defect in the workmanship, such as allowing a draught access to the trap or laying the bend too near the surface of the ground. Mr. Norman Shaw, in his pamphlet on the method of connecting water-closets with house-drains, stated that he had never known any inconvenience arise from frost, even in an arrangement which he should say would be far more subject to it than the ordinary closed soil-pipe. He agreed with what had been stated as to the inconveniences of water-waste cisterns, but they removed a considerable danger, and they should be used, at any rate, till something better is invented. As to rain-water gullies, he did not suppose they were necessarily the best or only appliances available, but he did not see any reason to call upon an owner to do away with them where they existed. It was the ordinary way to allow stack-pipes to discharge over gully traps, and in long-contaminated dry weather the water in these traps sometimes dried up, and the traps did not seal; in such cases any smell was easily prevented by pouring water into the trap. One gentleman, of great experience, declared that he (Mr. Martin) was wrong in saying that a surveyor should trust to the evidence of his own senses, stating that the senses were liable to lead him astray, and that he should depend rather upon his intelligence. He was not aware of any method by which people could apply their intellects to such a subject, except through the medium of their own senses or those of some one else, and he would still stick to his proposition that surveyors should not trust to anything but the evidence of their own senses.

The President said it seemed to him that all who had spoken agreed as to the importance of ventilating drains. It also seemed to be the general opinion that, wherever a pan-closet was found, it should be at once done away with, and yet it was astonishing in how many large and excellent houses in this country one found these old pan-closets. Whether this arose from ignorance or parsimony, it was difficult to say; but he was very much inclined to think that it was from ignorance. The builder's "crimes" were referred to, and it was said that legislation was wanted to punish him. He would ask whether it was quite certain that all the remedies already provided had been tried and had failed. Some of these builders were not worth "powder and shot," but he imagined that anybody buying a house and finding that the house was without connexion with the sewers, would have a good cause of action against the builder. As regarded concrete, unless builders were closely looked after, they would sometimes use a very inefficient material for keeping down the damp. As to the freezing of external soil-pipes, he could say, as a matter of personal experience, that they did sometimes freeze, as he found to his cost the winter before last in some houses which, unfortunately, belonged to him.

#### BRISTOL AND CLIFTON JUNIOR ARCHITECTS' SOCIETY.

THE first annual report, just now published, congratulates the members on the position which the society has now attained in art-life in the West of England. Various sketching meetings have been held, and during the year the following papers have been read before the members at the ordinary meetings of the society:—Mr. Henry Masters, on "Sanitation"; Mr. J. G. Moncrieff, "The Profession in Bristol, and its Influence upon Art"; Mr. W. E. Hill, "Apprenticeship"; Mr. Henry Masters, "Ventilation"; Mr. S. Fudge, "Master and Pupil." Fifteen ordinary meetings have been held during the year. The Council further endeavoured to encourage the members of the society in the study of architecture by offering prizes for the most carefully-executed measured drawings from an ecclesiastical edifice. The examiner (Mr. W. E. Jones) awarded the prizes as follows:—In competition No. 1, for members who have been connected with the profession more than two years,—to Mr. R. Milverton Drake, of Park Villa, Clevedon, five years in the profession, for drawings of Yatton Church, Somerset. In competition No. 2, for members who have been connected with the profession less than two years,—to Mr. H. T. Edwards (in the office of Messrs. Trew & Sons), in the profession six

months, for drawings of Long Ashton Church. On the recommendation of the examiner, a second prize, kindly given by the President, was awarded in No. 1 competition to Mr. S. Fudge (in the office of Mr. J. Y. Sturge, of Thornbury), for drawings of St. John's Church, Bristol; and the Council also awarded in No. 2 competition an extra prize to Mr. A. H. Fawn (in the office of Mr. Alfred Harford), for drawings of St. Peter's Church, Bristol.

#### GLASS IN HEBREW RECORDS.

At a meeting of the Society of Biblical Archaeology, held on the 22nd ult., Dr. Samuel Birch, president, in the chair, the Rev. A. Löwy read a paper entitled "Notices concerning Glass in Ancient Hebrew Records."

The Hebrew word *zechuchith* זכוכית is employed to denote "glass." Whether it has this signification (in Job xxvii. 17), or whether it relates to some precious stone, is a debatable question. The word *zechuchith* means a pure substance, and does not imply transparency. The Phœnicians, though credited with the invention of glass, have not left any other records except the names of some makers of glass vessels. On some Phœnician relics occur the name of Artas the Zidonian. Whether the Jews, as neighbours of the Phœnicians, were manufacturers of glass during the Biblical period of their history, cannot be proved by any relics. M. Longpérier published in 1857 the drawing of a vase in opaque white glass, which was brought from the East by M. Pérrier, the Chancellor of the French Consulate at Beyrout, and he suggested that this was a Jewish glass vessel, in which case it must be of a post-Biblical period. Of glass which came from Assyrian excavations, the British Museum has several specimens; one of B.C. 700 bears the inscription of Sargon. A more direct insight is given by the Egyptian monuments, where we have pictorial representations of glass-making. The earliest relic brought from Egypt bears the inscription of Thothmes III., and was made B.C. 1500. In the Aramaic dialects glass is called *zegugitha*, or *zugutha*, from which is derived the Arabic *sajaj*. In the Aramaic languages *zug* has the meaning of glass-like lustre, but this may be a secondary meaning. It is more likely that the glassmakers introduced the name *zugutha* from *zug*, a "combination," inasmuch as glass is the result of a combination of sand and soda. The Arabs have given a wide extension to the word *sajaj* or *sagag* amongst Mahomedan nations. But amongst the Aryan Mahomedans in India, in Persia, in Kurdistan, as also among the Turks, glass is called *shishah*. In Hebrew *shesh* or *shayish* is the name of marble, and may eventually have been used in the signification of glass. Whether glass was in the earliest days manufactured in Palestine, or not, glass vessels must have been known to the Jews. This is not to be inferred from the circumstance that the Palestine Exploration Fund has brought to light numerous fragments of glass vessels, for such vessels may have been made at a late period, but it is an indubitable fact that the Phœnician traders, according to the testimony of the Bible (Proverbs xxxi. 24, and Hosea xii. 8), constantly came to Judæa to offer their wares. Israelite women liked to adorn their necks with glass beads; specimens of such ornaments occur in the tombs of the Egyptians and the Etruscans. Among the treasures which Dr. Schliemann discovered at Hisarlik, the so-called site of Troy, and again in the graves of Mycenæ, Egyptian or Phœnician glass beads have been found. Even beneath the lakes of Switzerland, where the pile buildings of ancient inhabitants have been brought to light, glass beads were discovered, which none but Phœnician traffickers could have carried to Switzerland, just as they brought them into the lands of the ancient Britons. No doubt can, therefore, exist that the Hebrews of the earliest date were fully acquainted with articles made of glass.

**An Electrical Porter.**—A letter from Rome announces that a priest of Ravenna, named Ravaglia, has constructed an electrical apparatus which can be set in operation by simply pressing a button, and by which the doors of a large building can be instantaneously opened. The apparatus was tried during the last week of April at the Alghieri Theatre, in Ravenna, with the most satisfactory result. All the nine doors opened simultaneously, as if through some spiritual agency.



# MESSESS. DOULTON'S BUILDINGS ON THE ALBERT EMBANKMENT.

The open area in front of Messrs. Doulton's recently-erected new buildings on the Albert Embankment has just been enclosed by a parapet wall and balustrade, the base being in blue brick, and the balustrade and coping in terra-cotta, with piers of the same material along the line of enclosure, ornamented with glazed bosses in varied colours. The coping is surmounted by an ornamental railing, about 18 in. in height. An angular piece of land between the carriage approach to the buildings and the street line of the Embankment has also been similarly enclosed. A block of offices in front of the main building, in red brick and terra-cotta, with a high-pitched roof, covered in with red tiles, has also been completed within the last few days. That portion of the premises of the firm in Broad-street, immediately off the Embankment, and adjoining the offices and shaft erected a few years ago, is at present being rebuilt. The building, which is four stories in height, is faced with red brick, relieved by terra-cotta window-shafts, cornices, and dressings, with diaper work above the first floor. Messrs. Hill & Higgs are the contractors. It may be added that the whole of the Albert Embankment frontage, from the extreme boundary of Messrs. Doulton's premises to the corner of Church-street, opposite the entrance to Lambeth Palace, will in all probability shortly be in the possession of Messrs. Doulton and Messrs. James Stiff & Sons.

# THE WANSTEAD HOUSE PLEASURE GROUNDS AND EPPING FOREST.

The formal dedication of Epping Forest, on Saturday last, by the Queen, as a place of recreation for the public for ever, will shortly be followed by the opening to the use of the public of the Wanstead House pleasure-grounds adjoining, which the Corporation have purchased from the trustees of the late Lord Cowley. Under the Epping Forest Act the agreement between the Corporation and the trustees required the confirmation of Sir A. Hobhouse, the arbitrator under the Act, and within the last few days this confirmation has been effected.

The opening of these beautiful grounds to the public will afford an additional attraction to that already presented by the forest itself. The Wanstead House pleasure-grounds occupy an area of 182 acres, ornamentally laid out. They contain lakes, ponds, and islands, with a heronry and other attractions, in addition to woods and shrubberies intersected by numerous winding gravel-walks, extending entirely around the grounds, and abutting on and bounded by the river Roding. The purchase likewise includes some adjoining meadow-land in order to make the necessary connexion with Epping Forest and Wanstead Flats. About 80 acres of the grounds are well wooded, and there is a great variety of timber—sufficient, it is stated, to constitute an arboretum.

In exchange for the grounds the Corporation have several slips of Epping Forest, altogether about 50 acres in extent, and also pay the trustees 8,000*l.* out of the grain duties for the equality of exchange. The 50 acres in the forest to be given up to the trustees are destitute of trees.

# NEW FISH AND VEGETABLE MARKET AT NEWINGTON.

The agitation which has been going forward in reference to the Metropolitan Fish Markets, is led to a project for the construction of an extensive new market at Newington, near the Elephant and Castle Railway Station, on a large area of land belonging chiefly to Mr. Plimsole, formerly member for Derby. A company has been formed for the purpose, of which Mr. Plimsole is understood to be the chairman. The site of the proposed market, which will cover an area of between three and four acres in extent, is on the north side of New Kent-road, which it will have a frontage of about 300 ft. length, extending upwards of 400 ft. in depth towards Rockingham-street, Newington-avenue, which is proposed to be one of the approaches to the market. Upwards of 100 houses and business premises will have to be taken down in order to clear the site for the intended market, including several houses and shops in New Kent-road. A large portion of the site

between the last-named road and Rockingham-street has already been cleared. The promoters of the market undertake that the land upon which any buildings are now erected, and which shall be pulled down by the company, shall be erected until the company's new buildings are erected, in the same way as if the present buildings had remained standing. The Bill in connexion with the proposed market is now before the Parliamentary committee, there being no opposition, except that by the Newington Vestry with a view to improve the approaches.

The Committee have since passed the preamble of the Bill.

# THE ROWLAND HILL STATUE.

On Saturday last a large party of visitors were invited by Messrs. Young & Co. to view the casting in bronze of the statue of Sir Rowland Hill, K.C.B., at their works, Eccleston-street, Pimlico. The fluid metal,—about three tons, as we were given to understand,—was poured out of the furnace and ran into the mould in a very few seconds, the lever being raised by Mr. Whitehead in the absence of the Lord Mayor, who necessarily had to attend at Epping Forest. The statue, as our readers probably know, is to be placed at the back of the Royal Exchange, facing Cornhill. A very carefully-executed reduced model was on view, showing Sir Rowland in a standing position (without hat, although he is to stand in the open air), holding a book in one hand and a pencil in the other, necessary companions to thoughtful men, to jot down spontaneous ideas. The original was executed by Mr. Onslow Ford. The mould was contained in a large cast-iron box, partly buried in the foundry floor, having taken many months to prepare, on account of the very intricate process of piece-moulding which is necessary in this class of work, owing to the deep indentations in the drapery and other parts. It is expected, after the process of clearing, &c., to be ready for fixing by the middle of June. When turned out of the mould we hope it may prove as successful as the other works now to be seen at Messrs. Young's factory, among which is a large statue of General Lord Napier of Magdala, mounted, after Mr. Boehm, R.A., intended for India; also the bronze reliefs for the Temple Bar Memorial; and two somewhat heavy iron lamp-posts to be placed in Northumberland-avenue by the Metropolitan Board of Works.

# ST. MARY'S (R.C.) CHURCH, WESTBOURNE PARK.

On Thursday, the 13th ult., the Cardinal Archbishop of Westminster solemnly opened the above church, which is situated in Hazelwood-crescent, Rosworth-road, Kensal-road, near the Westbourne Park Station. The building consists of a nave and chancel under one continuous roof, and is 125 ft. in length by 30 ft. in width; two very narrow aisles intended only for processional use; and a chapel at the eastern end of the north aisle, dedicated to the Holy Ghost, beyond which is the sacristy. Externally, the church is built of red brick, with Bath stone dressings. In the western façade of the church is a large doorway, leading the eye up to the weatherings below the triple lancet windows; whilst the red-brick bell-turret, and the organ-chamber with its gable, relieve the south side of the church from monotony. The roof is covered with green slates. Internally, the high altar, with its reredos and altarium, the choir-stall, chancel screen and roof, nave benches, confessionals, and baptismal font, as well as all the fittings of the Chapel of the Holy Ghost, have still to come. The nave is divided into six bays, and the chancel, which is 40 ft. long, into three bays. The continuous barrel-vaulted roof is of unstained and unvarnished wood. One of the principal features of the interior is the clear-story. The chancel is raised two steps above the nave floor.

The architect is Mr. John Francis Bentley, of John-street, Adelphi, London. The cost of the church has been 5,000*l.*

# LION BUILDINGS, NEWINGTON.

Four extensive blocks of buildings in flats, designated as above, are at present in course of erection at Newington, near the Elephant and Castle Railway-station. The buildings are ap-

proached from the south side of New Kent-road, having frontages to two streets branching off from that thoroughfare, namely, Lion-street on the east side, and Sayer-street on the west side. There will be two blocks to each of the two streets just named, the length of the frontages respectively being 150 ft. The buildings are upwards of 50 ft. in height, and contain five floors. They are faced with stock brick and Portland cement window-dressings, bards, and cornices. The ground-floor portion of the frontages in the two streets consists of shops. The elevations to the top of the third floor are carried up with bay-windows, the fourth floor having ordinary square windows. The several blocks have flat roofs, which are enclosed by railings, with access to the roofs from the several tenements for drying and recreation purposes. Each block contains fifteen tenements, consisting of three apartments, the entire number of tenements being sixty, estimated to accommodate a population of about 300 persons. The several tenements are fitted with cupboards and other domestic requirements, each tenement having a water supply and sink, and there are likewise dust-shoots on each floor from the top of the buildings to the ground-floor. Within the rear of the blocks facing the two streets there is an open area for light and ventilation purposes about 20 ft. in width, and carried the full length of the buildings. Portions of the Lion-street blocks are already finished and occupied, and the Sayer-street blocks will shortly be commenced, preparatory to which the site will be cleared by removing the dilapidated cottages which at present stand upon it.

Mr. Barnard is the architect of the buildings, and Messrs. Patman & Fotheringham are the contractors. The owner of the property is Mr. Lepay.

# NEW TURKISH AND SWIMMING BATHS, LEEDS.

The Oriental Bath Company's buildings were erected from the plans and under the supervision of Mr. C. Brodric, architect, in the years 1864-5 and 1866, and the baths were opened to the public on the 28th day of July 1866.

From the first opening of the baths, the directors have felt the loss and inconvenience from not having a double set of baths, swimming and Turkish. To supply this deficiency, they brought the subject before the shareholders in August, 1880, and on estimates prepared by Mr. W. Bakewell, architect, Park-square, Leeds, they were authorised to carry out the necessary alterations, and to provide a new first-class swimming-bath. The architect has succeeded in transforming the old hall used as a gymnasium, and the side rooms, into a very fine first-class Turkish bath, consisting of hot, shampooing, washing, and bath rooms, cooling-room, with plunge-bath, fourteen divans,—two on the ground-floor and twelve in the gallery,—lavatory, ante-rooms, &c.

The new first-class Turkish bath (opened by the Mayor on the 23rd ult.) is approached by a spacious lobby, separated from the cool-room by a panelled screen fitted with a book-rack and umbrella-stand. This lobby leads to the cool-room, and to the grand staircase and gallery over. The ground-floor of the cool-room is provided with a plunge-bath lined with marble, and with divans for non-smokers. The gallery over the cool-room is also provided with divans for those who smoke. The suite of hot rooms, three in number, is entered from the cool-room. The shampooing-room is in conjunction with the hot rooms, and is provided with four shampooing-slabs. The washing-room adjoins the shampooing-room; a screen separates the washing-room from the sitz bath, needle, shower, and douche. The whole of the walls and floors of the above suite of rooms are lined and paved with marble, and fitted with marble bowls for washing and drinking purposes. The shampooers' and attendants' room on the ground-floor is placed betwixt the first and second class Turkish baths. The second-class Turkish bath is entered from a lobby leading into the cool-room which communicates with the suite of hot rooms, and in conjunction with them the shampooing-room. The heating of the baths is effected with hot air. The vitiated air is extracted by fines connected with the engine-shaft, thereby affording a continuous draught at all seasons.

The new swimming-bath, situated at the north end of the site, has been designed for a first-class bath. The ends are semicircular, to enable



the bath to continue his stroke without turning at each end of the bath. The boxes and lavatories are placed in the gallery, which is approached by two staircases. The ends of the gallery are also constructed semicircular. The bath is lined and paved with white marble, with bands of black marble to mark the water-line, and fitted with spittoons and guard-rails. The gallery is carried upon bracketed columns, boarded with pitch-pine. The boxes are constructed of red deal, and varnished.

The new offices, which have been constructed over the whole length of the façade of the old building, are approached from the centre of the building from Cookridge-street. The new portion of the façade forming the offices has been designed to harmonise with the new swimming-bath, as it was not thought desirable to carry out the new work after the style of the old building. The façade is faced with pressed bricks, with stone dressings, and carried out in the style in vogue early in the fourteenth century. The figure of the diving-girl, in the encaustic niche, was modelled and executed by Mr. J. Thorp, and is similar to the figure of the diving-girl that attracted considerable attention at the Paris Exhibition. The whole of the work has been carried out from the designs and under the superintendence of Mr. William Bakewell. Mr. Dews has acted as clerk of the works; Messrs. Franks & Evans, Craven & Umpleby, G. Thompson, J. Nickeson, and J. Cockersole have executed the works. The whole of the marble-work has been carried out by Messrs. Beckwith & Frankland. The art metal-work has been executed from the designs of the architect, by Messrs. Hodgkinson, of Coventry. The total cost of the new buildings has been about 7,000l.

#### STREET VENTILATION.

An address, by Mr. Alfred Haviland, F.R.C.S., at a recent *soirée* of the Natural History Society, has attracted some attention. Abstracts have been published by the *Brighton Guardian*. The object of the lecturer was to show the variety of atmospheric and physical conditions which may be found in one town, and that a want of competent knowledge of these differences may lead to injury instead of benefit, to patients who are sent to or select an unsuitable locality. A contour map of Brighton, which also showed the variations of soil, had been specially prepared by him to give a local illustration of the leading principles which have been enunciated by him in his work on the geographical distribution of diseases. The degree of elevation above the sea-level, the liability to occasional flooding in low land, the exposure to, or shelter from, particular winds, the porous or dense character of the soil, and the position of the streets in reference to the prevalent winds, are some of the material points which have been considered in preparing that work, and all of them were shown by the lecturer to exert influences even within the compass of one town.

Wherever the sea air has uninterrupted access, he maintains, as over a flat country, up broad valleys or valleys, and elevated country, we find a low mortality from heart disease and dropsy; on the contrary, in places where the tidal wave has no access, where the rivers run at right angles to its course, or to that of the prevailing winds, there we find the highest mortality from this cause of death. The principle applies to towns. Low mortality from heart disease is almost invariably coincident with free access of the prevailing sea winds. Streets, like rivers, should traverse a town so as to admit of the freest access to the prevailing winds; if they do not, there will ever be lurking about some air-sewage waiting to do mischief at a moment's notice.

This introduces a question of importance,—laying out the streets of a town,—which will be a new idea to many persons. Streets are usually laid out to suit the configuration of the land, but it is merely accidental if their direction is such as will comply with the object of getting the best wind ventilation. It is, however, open to those who want houses to look about for such as have a natural ventilation, and they would be wise not to lose sight of this, for Mr. Haviland shows by death-rate figures of different portions of the metropolis that the mortality is greater where the main thoroughfares are at right angles to the winds which sweep up the Thames. "To the east

of London Bridge there is no wide street at all, the districts being made up of an intricate interlacement of narrow streets, alleys, and *cul-de-sacs*, out of which it is almost impossible to drive the air-sewage. The mortality from heart disease is the highest average in that part of England."

#### THE VENTILATION OF HOUSE DRAINS.

Sir,—The replies you have received to my letter published in your issue of the 22nd ult. seem to show the necessity and importance of drawing more attention to the subject of the ventilation of house-drains.

Having recently received notice to connect my house-drains with the public sewer, I was naturally anxious to adopt the best possible plan of ventilation, but I found it by no means easy to select. The plan recommended by the Local Board here (Bromley), provided an opening near the surface of the ground, with an up-draught in the soil-pipe, and is the one which has also, I believe, been adopted by the Beckenham Local Board. These Boards have probably wished to follow the 65th paragraph of the Model By-Laws of the Local Government Board, which provides an inlet pipe for air at or near the surface of the ground, and an up-cast pipe; but it is not laid down that this up-cast pipe should be the soil-pipe. It may be so if the latter is of suitable size and arrangement. Many people in these parts have objected to the inlet near the surface of the ground, which is liable to become an outlet. Some, I am told, have even refused to have it at all, while some have closed it after it has been made. Not being satisfied, I inquired further. In the Banner system I found an up-draught in the soil-pipe and an inlet near the ground level. I saw Boyle's air-pump ventilators for the soil-pipe, and concluded from his advertisement (though now I am informed differently) that he, too, proposed to extract foul air upwards from the soil-pipe, especially as he shows no separate cowl for a downward draught. I also found in a local paper a figured diagram, with the two separate pipes and the two cowls, but, strange to say, the up-draught in the soil-pipe and the down-draught in the separate pipe.

It appears by the letter of your correspondent, Mr. Buchan, that the downward draught in the soil-pipe was proposed, as far back as 1858, by Mr. J. Honeyman, and subsequently by others. I am not concerned with the inventor's right of discovery, but wish assuring myself as to the best possible way of ventilating my house-drains, a subject of vital importance, and I confess that I was surprised at finding this question so unsettled.

The system which I am about to adopt for my own house is simply a down-draught cowl on the head of the soil-pipe carried up above the roof, and another pipe of similar size with the usual cowl for up-draught, also above the roof; this pipe to be placed as far from the soil-pipe and as near to the trap of the house-drain as possible.

I will not take up your space with commending its obvious simplicity, but only observe that when the air will not go the way we want it to go (as is too often the case) the foul air can only escape above the roof. There are many cowls, both outlet and inlet, to select from, but it is of comparatively little importance which is selected so long as they secure the current in the right direction.

H. P. RABARGE.

\* \* Here the correspondence must end.

#### A FEVER-BREEDING DEN IN ST. PANCRAS.

ONE of the worst places of this character has been brought to light before the Middlesex magistrates. About two months ago Mr. William Saunders, the owner of eleven houses in Poplar-place and Sophia-place, St. Pancras, was fined by Mr. Barstow, at the Clerkenwell Police-court, 10l. in respect of each house for neglecting to provide sanitary arrangements. He now appealed against the conviction, when four barristers were engaged in the case, Mr. Beesley and Mr. Morton Smith appearing on behalf of the parish of St. Pancras, in support of the conviction, and Mr. Mead and Mr. Goodrich for the appellant. The repulsive condition of the property was described by Mr. Beesley, who stated that last autumn particular attention had been directed to the houses when an outbreak of typhoid fever took place in St. Pancras. The houses were four stories in height,

each story consisting of one room. In these eleven houses forty-four families lived in the forty-four rooms, there being an average of four persons in each family. There were no windows to the backs of the houses. The only means of obtaining water by all these families was from a pump placed in a recess between Nos. 3 and 4, Poplar-place; and in the closets, which were placed beneath the stairs, there was no light whatever, the place being perfectly dark. No water was laid on to them, and the inspector, on going round, was obliged to retire in consequence of the terribly foul air. The condition of the place was so bad that the workmen who had been sent there were taken ill and were obliged to retire. In all probability the Bench never heard of a worse case, in which a landlord continued to demand high rents, and refused to put the houses in anything like proper repair.

Mr. Mead, on behalf of the appellant, urged that as the work was now being proceeded with the fines might be remitted, but the Bench having consulted, strongly condemned the conduct of the appellant, and stated that in the exercise of their discretion they could only consent to reduce the fines from 10l. to 5l., adding that the appellant must bear the full costs of the appeal in each case.

#### BUILDING PATENTS \*

APPLICATIONS FOR LETTERS PATENT.

- 2,006. M. Willeshaw, Lenton. Ventilating apparatus for greenhouses, &c. April 28, 1882.
- 2,015. G. Hurdle & W. Davie, Southampton. Opening and closing of window-sashes, &c. April 28, 1882.
- 2,017. H. J. Haddon, Kensington. Manufacture of mosaics. (Com. by G. Stanley, Massachusetts, U.S.A.) April 28, 1882.
- 2,022. J. H. Welch, Birmingham, and B. W. Spittle, Wednesbury. Attaching door-knobs to their spindles. April 28, 1882.
- 2,068. S. B. Wilkins, Edinburgh. Fireproof doors, &c. May 2, 1882.
- 2,080. W. Porter, Lee. Apparatus for testing the strength of materials, cement, &c. May 2, 1882.
- 2,097. R. Gaulton, Brighton. Producing artificial marbles, &c. May 4, 1882.

#### NOTICES TO PROCEED

have been given by the following applicants on the dates named.

May 2, 1882.

- 5,735. T. Drake, Huddersfield. Apparatus for heating water for warming rooms, halls, &c. Dec. 31, 1881.
- 46. W. Haughton, London. Open fireplace or grate. Jan. 4, 1882.
- 411. C. Pieper, Berlin. Construction of sewerage gullies. Jan. 27, 1882.
- 556. E. Verity, J. M. Verity, and B. Banks, Leeds. The securing of and ventilating by sash and other windows. Feb. 4, 1882.

#### ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending May 6, 1882.

- 3,961. R. H. Reeves, Parkhurst. Construction of drainage for the purpose of destroying noxious gases, &c.

The drain is trapped at suitable intervals to intercept the gases, while the sewage flows through freely. The trapping is effected by a tongue or shutter descending into the drain near the surface of the sewage, and the gas is drawn off by a fan or force-pump, and purified by being driven through a tank of water. Sept. 14, 1881. Price 6d.

- 4,012. S. Clark, London. Gas and oil stoves.

These stoves have a top and bottom chamber connected together by side tubes, and a central tube opens into the top chamber, within which is the burner. Inside the central tube, above the burner, is the air-tube, through which air passes to be warmed. The products of combustion, after passing up the central tube, go down the side tubes into the lower chamber, on their passage being condensed into aqueous liquid, which can be drawn off as required. Sept. 19, 1881. Price 6d.

- 4,083. W. Richards, Norwood. Apparatus for measuring water.

This is a piston meter, and the cylinder is divided into three chambers, the pistons on either side of the rough centres. In the lower chamber is a piston which slides on a fixed vertical tube in which is a rod having inserted in it a pin passing through slots in the tube. When water is admitted by the piston, it is raised, and by the pin lifts the rod and there by opens a valve in the upper chamber through which water flows into the lower part of the middle chamber, where it raises a second piston, a tube connected to which opens a second valve in the upper chamber, through which water is admitted above the piston in the lower chamber, and the water below being allowed

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.



to pass away, this lower piston is depressed, and the action is repeated. Counting mechanism is used to register the number of times the pistons are raised and depressed. Several modifications are shown. Sept. 23, 1881. Price 8d.

4,085. C. H. Murray, London. Apparatus for shaping and moulding clay for making bricks, &c.  
Each side of the die has on its face grooves to be supplied with lubricating material. They are arranged with elongated screw-holes in the flanges, so as to be adjustable for various kinds of work. Sept. 22, 1881. Price 6d.

4,101. Baron de Leibhaber, Avallon, France. Cleansing, &c., buildings of marble, stone, &c.

This uses certain chemical agents for this purpose, which vary according to the material to be acted upon, and the colour that it is desired to produce. Sept. 23, 1881. Price 6d.

4,115. F. Dyer, London. Flood-valves for drains, &c.

To prevent the inroad of floods into buildings through the drain-pipes, a valve is fixed in the drain, which consists of a seating formed in the pipe, against which is pressed by the flood a hollow ball of copper covered with indiarubber. This is suspended from the top of the valve by a rod which allows it to swing against the seating, or retire from it. Sept. 23, 1881. Price 6d.

4,136. W. Trusswell, Sheffield. Appliances for heating by steam

This apparatus consists of a boiler and suitable pipes, a supply-cistern, and a back-pressure valve. The steam, after traversing the pipes, goes to the supply-cistern, where it is condensed. The supply-cistern is level at such a height that the pressure of the water will raise the back-pressure valve, and keep the boiler full. Sept. 23, 1881. Price 6d.

4,151. W. P. Thompson, London. Fireplaces and grates for warming rooms.

A sheet of metal is placed against the walls at the back and sides of the fireplace, in front of which is secured the grate. This insures the radiation into the room of the heat usually absorbed by the walls, &c. (Comm. by J. M. Cook, Cincinnati, U.S.A.) Sept. 27, 1881. Price 6d.

4,152. W. R. Lake, London. Apparatus for heating dwelling-houses, &c.

This apparatus uses air which is heated in a furnace and passed by pipes to the rooms above, where they open into radiators of metal, whence the cold air is again returned to the furnace. (Comm. by B. R. Hawley, Chicago, U.S.A.) (Pro. Fro.) Sept. 27, 1881. Price 2d.

4,183. R. Stone, London. Machinery, material, and apparatus used in the manufacture of bricks and pottery ware, &c.

River mud is used direct from the bed of the river, with which is mixed wasted ground-lim to absorb the moisture. After the first burning the bricks are cooled down, and then reburnt at a much higher temperature until they become vitrified. Sept. 23, 1881. Price 4d.

4,185. F. H. F. Engel, Hamburg. Treating calcareous bricks.

While they are warm the bricks are brought from the oven and placed in pits filled with water, which kills the lime contained in the bricks without the usual blistering and expanding effect. They are then forwarded to (Comm. by J. A. A. Rask, Wickenburg, Germany.) Sept. 23, 1881. Price 4d.

4,187. G. W. Wigner & R. H. Harland, London. Heating water by gas for baths, &c.

The tube in which the gas and air mix surrounds the rising pipe of the circulating system, and the burners are arranged to throw a ring of flame against the pipe, which is also surrounded for some distance by a casing through which the products of combustion ascend from the burners. Sept. 23, 1881. Price 6d.

4,204. H. Parsons, Dulwich. Appliance for securing casements, &c.

This consists of a strong metal butt hinge, one leaf being attached to the jamb or mullion, and the other to the casement. A quadrant is attached to this latter part, and a circular metal button secures the quadrant in the desired position. (Pro. Fro.) Sept. 23, 1881. Price 2d.

4,226. C. Hook, Bridgwater. Window sashes and frames.

The sash-frames are hung one to the other by chains passing over rollers in the top of the window frame. (Pro. Fro.) Sept. 30, 1881. Price 2d.

4,251. F. Wersmann, New Charlton. Manufacture of floorcloths.

Instead of cork dust, most part of the genus *Sphagnum* is used, which is dried and reduced to powder, and then passed through sieves. The coarse powder is used for the floorcloths. Oct. 1, 1881. Price 2d.

4,257. J. Wadsworth, Manchester. Gas heating stoves.

The products of combustion are received into a vertical metal hood, surrounded by a hot or terminal wall with a series of passages, so that a large body of air shall enter and mingle with the main current. (Pro. Fro.) Oct. 1, 1881. Price 3d.

**Proposed New Lunatic Asylum.**—At the Easter Quarter Sessions at Swansea, the report of a committee, recommending the erection of a new lunatic asylum at Pore Gwili, was discussed. The present asylum at Bridgwater was said to be full, and, in addition to the 610 inmates it had, there were 100 others boarded out in various places. The proposed building would accommodate between 300 and 400, and the cost would be 49,000*l*. The question was referred, pending a formal authority from the Secretary of State to carry out the proposed action.

## SANITARY SHORTCOMINGS.

*The "Water Supply" of a Devonshire Village.*—To the Okehampton Rural Sanitary Authority, at its meeting on the 22nd of April, Dr. Linnington Ash, the medical officer of health, presented a special report on the water supply of Exbourne, and at the same time alluded to the general sanitary state of the village. A large and good drain, he observed, existed in the upper portion of the village, but many of the houses were unconnected and were badly drained, for in them were frequently open privies with cesspits, which formed nuisances that polluted both the neighbouring soil and atmosphere. These conditions would undoubtedly favour the spread of infectious disease. The means for removal of excrement were very unsatisfactory, where they existed. The water supply was very deficient, and called imperatively for the serious and sustained consideration of the authority. Of the seventy-one houses, only twelve had an independent supply, and those were for the most part situated at the lower end of the village. The upper part, which was the most thickly populated portion, was mainly unsupplied with water. In that portion many houses had been built and occupied in contravention of the Public Health (Water) Act, 1878, having no available water supply within a reasonable distance.

*The Drainage of Helston (Cornwall).*—Dr. Ballard, of the Local Government Board, having reported on the unsatisfactory sanitary condition of this town, and recommended the adoption of a proper system of drainage, a meeting of the Town Council has been held to consider the matter. Judging from the tone of the speeches made (as reported in the *Western Morning News*), the majority of the councillors are tolerably well satisfied with things as they are, although, it seems, among other evils, the water-closets in Wendron-street and Menage-street at present empty themselves into the public water-kennels. Some of the speakers argued against the adoption of a system of sewerage because, unless properly carried out, there would be danger from sewer gas! Ultimately, Mr. Trevenen moved, "That the opinion of a practical engineer be obtained as to the most effectual mode of disposing of the sewage of the town, and of generally carrying out the provisions of the Public Health Act." Mr. Walter Tyacke seconded the motion. Mr. Dale proposed that "the Council resolve to enforce the construction of proper and efficient closet accommodation throughout the borough, and to appoint an officer who shall see that the decisions of the Council with reference to the disposal of refuse matter are properly carried out." This was seconded by Mr. R. Cade. Mr. Trevenen, with a desire to avoid a division, amended his resolution by using the words "competent opinion be obtained," instead of "practical engineer be called in," but Mr. Dale declined to withdraw his amendment, which was carried, six voting for it, and five (including the Mayor) for Mr. Trevenen's proposition.

## DOOR-STEPS AND WINDOW-SILLS.

Let any one (says a writer in the *Newcastle Courant*) observe in walking through London, or any large town, and he will find there is as much room for the display of variety in taste in the washing of a door-step as there is in the treatment of a work of art. The genuine London housemaid washes as little of it as she can, and were it not that the operation gives her any opportunity for talking to the baker's boy, or for anticipating the visit of the postman and receiving her letters first-hand, it is doubtful whether she would wash any of it at all; the idea being, apparently, that the approaches to a house are in the keeping of the local authorities, and that the work of the housemaid does not lie beyond the bell-handle and door-plate.

In the manufacturing districts more frequent washing becomes a necessity. In the towns of Northumberland and Durham, Lancashire and West Yorkshire, the people live in an atmosphere more or less impregnated with soot, which, in spite of contrivances for the consumption of smoke, finds its way, like the foot-and-mouth disease, into quarters where any one living beyond the district would never expect to find soot. Comfort thus contributes to cleanliness, for it is impossible to be comfortable unless cleanly, and the process called "cleaning down" in those districts is a diurnal, weekly, and quarterly process. There is abundant evidence

of the daily process in the flushing of the door-step and pavement, just as there is of the weekly cleansing in the appearance of the windows, or of the less frequent renovation in the presence of whitewashers and painters. People who migrate from the South to the North of England, unused to this scrubbing fever, and not at once recognising its necessity, sometimes earn a reputation for being careless and dirty. Housemaids, indeed servants of every grade, are always difficult to obtain in the manufacturing districts, and they were never more difficult to obtain than they are at present. This is generally attributed to the fact that they can earn higher wages in the mills and warehouses, but to this must be added that, owing to the smoke, in any house in the Northern manufacturing towns a girl has twice the amount of cleansing to do that she would have in an agricultural district, or in a town not dependent for its trade on factories and smoky chimneys.

While a South Country housemaid would devote little time to the cleaning of the door-step, as though to wash it would be interpreted as a protest against entering the house, the same domestic in the counties of Durham and Northumberland would scrub it with a sandstone, and produce an effect as though the slab had just left the builder's hands, as the cost of the slab itself in time. In the colliery districts a yellow clay takes the place of sandstone, the sale of clay being a trade among a poor class of hawkers. Whitening and pipe-clay are also used. In Huddersfield, the Belgravia of the West Riding, the edge formed by the top and face of each step is bevelled, and the bevel is whitened, the top and side of the stone being simply washed. The effect is curious, and as the whitening, or ground chalk, is apt to smear ladies' dresses, the result is sometimes inconvenient. Hardly less objectionable is the practice of Welsh housemaids in scrubbing only the surface of the steps, leaving the face untouched, dirty, and wet.

As a rule, the window-sill is dealt with in the same way as the door-step. In some parts of Northumberland, for instance, door-steps are whitened, and so are window-sills; while in the colliery districts of the north-east they are coloured with the yellow clay which alternates with the layers of limestone which abound there. The most singular style of decoration is that which is in use among the poor in South Wales, where, as in Cardiff and Swansea, the window-sill and lower sashes are furnished with black lead, which has a curious and incongruous effect. The reason for this is not very obvious, and certainly the adoption of a sensible suggestion that window-sills should be of cast metal, and adapted for the purpose of window-gardening, would be a decided improvement.

## PAYMENTS UNDER UNSEALED CONTRACTS.

THE QUEEN v. THE MAYOR AND CORPORATION OF NORWICH.

THIS case, which came before the Queen's Bench Division last week (sittings in *Banco*, before Lord Coleridge, Mr. Justice Grove, and Mr. Justice Lopes), is reported in the *Times* of the 6th inst. The case raised a question as to the power of corporations to make payments to contractors or persons they have employed upon proper and necessary works, though under contracts not under seal, and so not legally valid or obligatory on the Corporation. The question had arisen in the present case under these circumstances:—

A piece of land had been presented to the Corporation for the purpose of widening a street, on condition that the street should be paved with wood. The offer was accepted with the condition, the resolution saying that the street should be paved with wood at a cost not exceeding 150*l*., which it was then supposed would be the expense incurred. The Corporation had a contract under seal for laying wood pavements for them at certain rates, they finding the materials, and their engineer directed the contractor to do the work, supplying him with the blocks, which he obtained without any contract in writing by verbal orders from a tradesman, all under 50*l*. in amount (except one which was for 50*l*. 15*s*.), and in like manner as to the iron kerbing, which was obtained in the same way from another tradesman, all the orders being under 50*l*.; but the aggregate of the contractor's bill was over 100*l*., and the other two bills were also over 200*l*. each; and the total amount of the expense incurred was 590*l*. The bills were brought before the executive committee, who, after some discussion, the engineer certifying that the work was satisfactorily done,



agreed to recommend the Council to pay the bills, and the Council, after some discussion, so resolved, without a division, on the ground that, though no doubt they were not legally bound, yet, as the work was well done, the claim was just. A member of the Council who was present at the meeting, and had not divided against the resolution, had applied for a rule for a *certiorari* to bring the resolution before this Court to quash it as invalid, under sec. 44 of the Municipal Corporations Act Amendment Act (7 Will. IV., and 1 Vict. cap. 78), as directing a "misapplication of the borough funds," because under sec. 174 of the Public Health Act, 1875, contracts of corporations above 500 should be under seal. The rule *nisi* had been obtained, and was now argued.

The Court, after long argument, came to the conclusion that there would be no misapplication of the funds of the Corporation merely by payment under contracts not legally valid (even assuming the contracts to be within the enactment as over 500, in amount), the work being useful and valuable and for the benefit of the ratepayers, and the prices appearing to be fair and reasonable. The application, therefore, was refused.

#### LIABILITY FOR FALL OF CHIMNEYS.

LUCAS V. SAMUEL.

This was an action (before Mr. Justice Manisty and a common jury, Queen's Bench) by the tenant of a house in Keppel-street, London, against his next-door neighbour, to recover damages for injuries done to his house by the fall of one of the defendant's stacks of chimneys during a violent storm on the night of October 13 14, 1881.

The case for the plaintiff was that this stack of chimneys was improperly built and not properly kept in order after the mortar had decayed from the exposure to the weather and lapse of time. The plaintiff had spent over 150*l.* in repairs after the accident.

After his Lordship's summing up, the jury retired to consider the following questions, to which they returned the answers appended:—1. Did the defendant use due care to maintain his chimney so as to make it in a reasonably safe condition to withstand any storm that he might reasonably expect? Answer: No.—2. Was the chimney in such a condition at the time of the accident? Answer: No.—3. Was the force of the storm such as might have been reasonably expected by the defendant? Answer: Yes.

On these findings the learned Judge entered a verdict for the plaintiff, and said to the jury that now the question of damages would arise; and the foreman said they were unanimous in awarding the plaintiff 75*l.* damages.

Thereupon his Lordship entered up judgment for the plaintiff for that amount.

\* \* This will afford an answer to "J. J." and three other correspondents who suffered damage during the last gale.

#### CASE UNDER THE EMPLOYERS' LIABILITY ACT.

SPRING V. HALL, BEDDALL, AND CO.

This was a case which came before the Lambeth County Court on the 4th inst., before the judge, Mr. J. Pitt Taylor, and a jury. The damages were laid at 350*l.*

The plaintiff is a carpenter, residing at Brixton, and employed by the defendants, who carry on business as builders. On the 30th of September last he was working in a shop in the Buckingham Palace-road, and above him was erected some scaffolding for the use of plasterers, who had at that time finished their work, but the scaffolding was not taken down, and gave way about three o'clock in the afternoon, the plaintiff being so severely injured that he had to be removed to King's College Hospital. His skull was injured, and ever since he had been entirely laid aside from work, and had to be assisted into court. The contention of the plaintiff was that the scaffolding was erected by the direction of, and under the superintendence of, Mr. Wright, one of the defendants' foremen, and that it was not secured in a safe manner, the support being fixed in the walls with a wedge, which was likely to come out at any time.

For the defendants, evidence was given to show that the wedge had been removed without authority, and that, even independently of that, the work was done in an ordinarily safe manner, and the falling of the boards was an accident which could not be foreseen.

His Honour summed up the evidence, and expressed his opinion that the plaintiff had failed to prove the negligence of the foreman; but

The jury, after a short absence, said they were of a different opinion, and gave a verdict for the plaintiff for 25*l.*

Notice of appeal was given.

#### PUGIN TRAVELLING STUDENTSHIP.

SIR,—I wish to call your attention to an omission on the part of the Institute to fulfil one of the duties devolving upon it as administrator of the above Trust. Clause 10 of the "Regulations for the Administration of the Funds" provides that "a separate tablet, or separate tablets, recording the names of the students, shall be set up, and for ever preserved in a conspicuous part of the premises of the Royal Institute of British Architects."

The necessity for this is shown by what took place last week, when the Institute notice-paper contained what professed to be, but was not, a complete list of the students already appointed. If uncertainty as to these has grown up in half a generation, unless the provisions of the Trust be carried out in this particular a correct list will presently become impossible.

J. TAVENOR PERRY.

#### "HEALTHY HASTINGS."

SIR,—In your article on Hastings last week (p. 542), you say it would be a serious oversight to ignore the ever-increasing wants of the working population. This is a failing with most sea-side towns, but specially so with Hastings, under the mistaken idea that all who, for health's sake, find it necessary to take a brief holiday at the sea-side, have well-filled purses, and will not hesitate to pay the increased prices demanded of them for everything they buy. Although the town has doubled within the last twenty years, but little provision has been made for the respectable working class, who, in the endeavour to recruit their health by a visit to the seaside, find the expense too great for the pleasure they would venture upon. Houses seem only to be built for those of the upper class who have both time and means at command. Hastings is far behind Brighton in accommodation for the people, and with regard to bathing,—one of the principal objects of a sea-side visit,—Hastings ignores the working classes, no accommodation being allowed on the vast extent of beach, except at the extreme ends, some two or three miles apart. Why should not facilities be given for free bathing in the central parts of the beach, instead of the people being compelled to walk a long distance to either the eastern or the western extremity of the towns? Why should the beach be monopolised for the benefit of the few, and the many be debarred from so health-giving a luxury? At Brighton, even in front of the Grand Hotel, the beach is open to all comers up till eight a.m., and no inconvenience results. I might say a word or two about lodgings, which in Hastings seem only to be provided for the rich. The working classes are not thought of.

J. B.

#### A NOTE FROM ISLINGTON.

"MEN may come and men may go," but exhibitions go on for ever; and though the second annual "Furniture Trades Exhibition" at the Agricultural Hall may lack the charm of some we remember, still it cannot fail to be of great use, opened as it is in a part where so many of the working classes live, giving them the opportunity of comparing, aiding many an undeveloped idea, and suggesting many new ones; besides also affording them an hour or two of harmless and enjoyable recreation, the value of which who shall estimate? To a large portion of the public, or to those hesitating how to furnish their houses, the exhibition has the advantage of giving them the opportunity to see placed in juxtaposition the different styles, and to test their effect, and, to idlers like myself, the indulging in a little dreamy retrospect. For furniture, such as we see here grouped together in the Mediaeval, the "Early English," the Renaissance, the ever pretty and quaint Queen Anne, &c., takes us a little back through the dim vistas of time. What, I wonder, were the house arrangements of our hardy ancestors, the early Britons? History tells us that their costume was exceedingly economical, though for this climate somewhat cool,—one of blue paint. Nails and glue were evidently unknown to them, so we must suppose that they sat on blocks of stone, or on hewn wood. We are sorry for them, as certainly during our pilgrimage it is well, if we can, to enjoy a little ease. However, perhaps we do not miss the pleasures we do

not know; and probably, could we be present a hundred years hence on this sublunary sphere, we should see stranger things than have ever "been dreamt of in our philosophy." We are told by some that this age is but the babyhood of science, and a most frightfully scientific and very unpoetical world I fear it will become.

But to "return to our mutons," I have no intention in such a slight notice as this, and where all the exhibits are so generally excellent in their various styles, to allude to them individually. There is something for all tastes and all purses,—though the cheapness, combined with essentially good taste and elegance, was in many instances remarkable. One naturally lingers near the glass and china exhibits. They have a fascination difficult to resist, and the perfection our English manufacturers are arriving at is such that we need not fear competition with any country. There is a dessert-service of Minton's, in Osler's exhibit, for twelve persons; the price, a hundred pounds. Ivory white ground, with branches of different coloured gold leaves, on silver stems. It is a thing, as *Punch* says, "to live up to." There are also other sets at four pounds the plate in imitation of Sèvres, with those delicate tints that look as evanescent as in reality they are lasting. I saw in Paris a dessert-service of which each plate was a picture copied from those in the galleries of the Louvre. The service cost a thousand guineas; but in actual tinting and in elegance of design several of our own manufacturers could have successfully competed with it at less cost.

We make a rapid rush, and passing from the artistic to the material, stay a moment in Green's exhibit of stoves to watch the burning of the anthracite coal. It certainly seemed to answer there. There was no smoke, the fire was bright, but the heat was tremendous. There are everywhere up in the galleries and down below the usual exhibits of every species of industry, and which, however often seen, have always a fresh interest, as there is generally some improvement on the article as originally made to be noted.

One thing, however, no one will miss, and that is an automatic clock, or "Dardenne Perpetual Regulator," which stands near the main entrance. This clock never requires winding up, and by means of the simplest wheelwork gives the greatest possible amount of regularity. The winding is effected by the action of a current of air acting on a special piece of mechanism, which permits of constantly maintaining the clock in the same state of perfect working. The current of air referred to maintains, in a state of continual suspension, the actuating weight of a regulating clock, arranged so as to guarantee such perfect regularity that the greatest differences do not amount to five minutes in a year. The inventor of the clock, which goes a long way in the direction of perpetual motion, is M. Auguste Dardenne, who constructed a similar timepiece for the Paris Exhibition; but the clock of 1878, it is stated, "contained only the rudimentary idea of the present system, and was far from offering those guarantees of good working and precision as does the improved clock as it is at present constituted." It may be mentioned that for indoor use it is sufficient to apply the air apparatus to any convenient chimney, with which it is put in communication by a small orifice about 4 in. in diameter.

Not only are the spacious galleries that surround the hall filled with exhibits,—piano-fortes being conspicuous,—but King Edward's Hall, with entrance on the left of the arcade from Islington-green, has been fitted as a suite of rooms, decorated and furnished by several eminent firms. This "Renaissance Court" is lighted by 160 electric lights, supplied by the Rogers Electric Light Company, of Holborn Viaduct. The furniture, which is in the "Renaissance" style, has been supplied by Messrs. With & Sons, of Stuttgart; the carpets by Messrs. Cardinal & Harford; the parquet-floors by Mr. H. Bassant; the chandeliers by Messrs. Verity Bros.; the paper-hangings by Messrs. W. Woollams & Co.; the statuary by Messrs. Norobi & Co.; the curtains by Messrs. Pratt, Hurst, & Co. and Messrs. Conrath & Son; and the electro-plate by Messrs. Mappin & Webb. In the "Renaissance Court" are displayed some good suites of furniture, arranged in cosy-looking model-rooms, which are lighted by electricity. This court, in King Edward's Hall, presents a remarkably novel appearance; there is an almost indescribable softness about the interiors. And so, being comforted, we wind our way homeward.

CARLETON.



### PROPOSED WIDENING OF WESTMINSTER BRIDGE ROAD: "ASTLEY'S."

THE taking down of some property at the corner of Stangate, near Westminster Bridge, with the view of rebuilding the same, has led to the Lambeth Vestry taking steps for the widening of Westminster Bridge-road, from Stangate to Palace-road, opposite York-road. A memorial has been sent to the Metropolitan Board by the Vestry on the subject, in answer to which, it appears, the Board suggest that the Vestry should acquire the property required for the improvement, and then apply to the Board for a contribution towards the cost, hopes being held out by the Board that they might probably contribute as much as two-thirds of the cost. The suggested improvement is to set back the property at the corner of Stangate, so as to be in a line with Westminster Bridge, and then to continue the improvement in a sloping line to the corner of Palace-road. The subject was under discussion at the last meeting of the Lambeth Vestry, when Mr. Andrew, as chairman of the General Purposes Committee, said the estimated cost of the improvement would be 30,000*l*. Mr. Fowler observed that the Metropolitan Board had no statutory power to put a stop to the erection of buildings at this corner, though the Vestry had. The Vestry would therefore stand in the position of the Metropolitan Board, and would be recouped the expense. In answer to a question, Mr. Andrew said they proposed to take Astley's amongst other property, on which Mr. Howlett said the estimate of 30,000*l*. as the cost of the improvement was deceptive, for it was well known that Astley's alone could not be purchased for 30,000*l*. Mr. Andrew rejoined that he was certain a profit could be made by purchasing the property and reselling the sites. The necessity for the improvement was palpable to all who travelled in the vicinity. A memorial to the Metropolitan Board on the subject was agreed to by a large majority, and it was also resolved to forward the plans to the Board.

### FIRE RISKS INCIDENTAL TO ELECTRIC LIGHTING.

A LECTURE, illustrated by many experiments was delivered before the Society of Arts on the 3rd inst., by Mr. Thomas Bolas, F.O.S., on "The Fire Risks Incident to Electric Lighting." Having shown, among other instances of the combustion of ordinarily incombustible materials, how wires of different kinds of metal become incandescent or burned when electric currents were passed through them, the lecturer proved that coal gas might be ignited by the smallest electric spark, and that gutta-percha and other substances commonly used for insulating electric wires might be fired by irruptive discharges of electricity. The different characters of the currents employed for arc lights and for incandescent lamps were explained, and incandescent lamps placed against muslin curtains were broken, to prove that there was no danger of a fire from such an accident. Mr. E. J. Paterson showed how an incandescent lamp fitted in a red lamp might be used for safety in the photographer's studio, with a small portable battery of his invention. There were, no doubt, the lecturer said, in concluding, dangers in the employment of electricity for lighting, but with reasonable precautions he believed electricity might be used more safely than gas. Mr. W. H. Preece, F.R.S., who presided, remarked that, while he had in the columns of the *Times* called attention to some dangers which had to be guarded against in the use of electricity, there was no reason why those who could make the lightning harmless should not control machine currents. Properly and scientifically employed, electricity afforded a means of artificial illumination which should be rendered absolutely and perfectly safe. It would greatly contribute to the comfort of timid householders if the electrical lighting companies and the fire-offices would agree upon a set of rules having the approval and sanction of the leading electricians.

**Conversazione.**—The President and Council of the Royal Society of Painters in Water Colours have issued invitations "to have the honour of meeting H.R.H. the Princess Louise, Marchioness of Lorne," on Tuesday, the 16th instant.

### PROVINCIAL THEATRES.

SIR,—I have read with considerable interest your reports and remarks on the London theatres, and the protection of the same from fire. You have in London the Home Secretary, the Lord Chamberlain, the Metropolitan Board of Works, the Licensing magistrates, and Captain Shaw, C.B., to look after them; but what about the provincial theatres? Are we to be allowed to be crushed in panics or burnt in fires occurring at such? Surely what is good in the shape of legislation for theatres in London is equally so for theatres in the country. There are many theatres which have no pretension whatever to being possessed even of a fifty-shilling fire-pump on the stage or in any other part of the building.

A PROVINCIAL.

### Books.

*Examples of Iron Roofs.* By THOS. TIMMINS. Vol. I.—Outlines of Principals, Details and Weights, Details of Principals and Ventilators, Strength of Columns and Struts, Diagrams of Strains to Actual Loads, Diagrams and Multipliers to Load of 1. London: Thos. Timmins, 28, King's-road, Peckham. 1882. THESE outlines and calculations are intended mainly for the use of architects, surveyors, and builders, and will be found valuable.

*British Mesozoic Portraits; being a Descriptive Catalogue of these Engravings from the Introduction of the Art to the Early Part of the present Century. Arranged according to the Engravers; the Inscriptions given at full length; and the Variations of State precisely set forth; accompanied by Biographical Notes, &c.* By JOHN CHALONER SMITH, B.A. Part IV., Division I. London: Henry Sotheran & Co.

WE have already spoken of the previous issues of this useful work, and need simply mention the appearance of the first portion of the fourth part. The second division of this part will include a history of the art, and an index of painters.

*Weale's Rudimentary Series (227). A Treatise on Mathematics as applied to the Constructive Arts, illustrating the various Processes of Mathematical Investigation, by means of Arithmetical and Simple Algebraical Equations and Practical Examples; also the Method of analysing Principles and deducing Rules and Formulae applicable to the Requirements of Practice.* By FRANCIS CAMPIN, C.E., Past President of the Civil and Mechanical Engineers' Society. London: Crosby Lockwood & Co., 7, Stationers' Hall-court, Ludgate-hill. 1882.

A SECOND edition of this compendious little volume has been published, and will be found to include a new part dealing with the higher mathematics.

### VARIORUM.

"HINTS for Investors, being an Explanation of the Modes of transacting Business on the Stock Exchange; to which are added Comments on the Fluctuations and Table of Quarterly Average Prices of Consols since 1769. By Walter M. Playford, Swin Broker. London: Crosby Lockwood & Co. 1882." The title fully explains the object of this little book. It is written by a practical man, and may be read usefully by all who are interested in investments or desire to be so.—"The Handbook to the Rivers and Broads of Norfolk and Suffolk. By G. Christopher Davies, author of 'The Swan and Her Crew,' &c. London: Jarrold & Sons, 3, Paternoster-buildings." We believe this is the only handbook ever issued giving a description of these beautiful inland waters, beautiful to the great majority of tourists as strangers. Mr. Davies is not unknown as an author, having written that capital book for boys "The Swan and Her Crew," published by Messrs. Warne & Co. A good map accompanies the book, which is the only key, published in one sheet, to these inland waters.—"A Practical Treatise on Coach-building. Historical and Descriptive, containing full information of the various Trades and Processes involved, with Hints on the proper keeping of Carriages, &c. With fifty-seven Illustrations. By James W. Burgess. London: Crosby Lockwood & Co." This forms a new part of Weale's Rudimentary Series, and comes in time to help the Coachmakers' Company in their endeavours to elevate the trade.—"Middle-

brough and its Jubilee: a History of the Iron and Steel Industries. With Biographies of Pioneers, Portraits and numerous Illustrations. Edited by H. G. Reid, Middlebrough-on-Tees. London: The Gazette Office, 62, Ludgate-hill." Mr. Reid published this volume with special reference to the Middlebrough Jubilee, but it has an interest beyond its temporary purpose, inasmuch as it includes a concise history of the iron and steel industries of Middlebrough, and biographies of pioneers. We gave not long ago some particulars of the remarkable growth of the town.—Messrs. Crosby Lockwood & Co., London, announce the following as just ready for publication:—A new and enlarged edition of "The Manual of Colours and Dye Wares: their Properties, Applications, Valuation, Impurities, and Sophistications, revised and enlarged by the author, Mr. J. W. Slater," a handy little waistcoat-pocket volume for mechanics, engineers, builders, &c., entitled "Tables, Memoranda, and Calculated Results, selected and arranged in a compact form by Francis Smith." Messrs. Crosby Lockwood & Co. will also issue immediately the following technical works in their popular Weale's Rudimentary Series:—"The Construction of Roofs of Wood and Iron," designed chiefly from the works of Robison, Tredgold, and Humber, by E. Wyndham Tarn, M.A.; "Elementary Decoration, a Guide to the Simple Forms of everyday Art as applied to the Interior and Exterior Decoration of Dwelling-houses, by J. W. Faery, jun.," and "A Practical Treatise on Handrailing," by George Collings.

### Miscellaneous.

**Proposed Lecture Hall for St. John's, Hammersmith.**—A meeting of the congregation of St. John's was held in the school on the 3rd, to consider a scheme for erecting a mission lecture-hall in the parish. The Rev. W. A. Whitworth, vicar, presided. It was announced that Mr. H. A. Dowse, solicitor, of Highgate, formerly churchwarden of St. John's, had promised to do all the legal work free of charge. Mr. Gough had also given his gratuitous services as architect, and had drawn plans with which the Church Council were much pleased. The whole of the site would be occupied by the Lecture Hall, 109 ft. by 30 ft. 9 in., class rooms and kitchen being provided in the basement. It was proposed by Mr. Bruce, and seconded by Mr. Bloxam, "That as many of the Tower Building Committee as are still members of the congregation, with the addition of Mr. Churchwarden Alderton, be appointed a committee to consider the means of carrying out the scheme, with power to add to their number." The motion was carried with only one dissentient. A discussion arose as to whether it would be necessary to purchase the freehold of the site. It was stated that the owner of the land would grant a long lease at 2*l*. ground-rent, and would also advance 1,000*l*. at 4 per cent. on the security of the building.

**New Process of Dealing with Sewage Sludge.**—Hitherto the great drawback to treating sewage by precipitating processes has been the difficulty of drying and disposing of the resultant sludge. At the Coventry Sewage Works, which we described some four or five years ago, it is stated that the difficulty has now been overcome in the following manner:—The sludge is pumped into an iron trough which supplies two cylinders, and is forced from these into presses by one of Johnson's patent air-compressors. Once within the presses, the pressure is kept constant and uniform, and the water of which the sludge is chiefly composed pours out in continuous streams, leaving, at the conclusion of the process (which occupies only a few hours), the sludge, in the form of dry, firm sewage cakes, 3 ft. by 3 ft., and 1½ in. in thickness. In this form the sludge, which was before an almost unsaleable commodity, now meets, we are told, with a brisk demand, being readily purchased by farmers. Have these cakes been analysed?

**Improved Mortar.**—Sawdust is better than hair in protecting rough-cast from peeling and scaling under the influence of frost and weather. The sawdust should be first dried, and then thoroughly sifted, in order to remove the coarser particles. A mixture is then made of two parts sawdust, five parts sharp sand, and one part cement, which should be thoroughly stirred together, and then incorporated with two parts of lime.—*Der Techniker.*



**Grocers' Machinery.**—Messrs. Newson & Sons, of Cork, have been busy, during the past couple of months, in making additional improvements in their extensive establishments. They have had erected machinery of great power for the various operations connected with the cutting of sugar, coffee-roasting, tea-mixing, &c. In the sugar-warshouses they have a six-horse power gas-engine driving the different machinery in that department, including a twelve-horse hoist for carrying sugar and other goods between the basement and the several floors. This "cage," which has been provided by the firm of R. Waygood & Co., is furnished with patent safety gear, which appears to be so simple and reliable that it cannot fail to act effectually in case of the rope breaking. To prevent the cage "over-winding," it has an automatic stop at the top and bottom, which certainly is a very necessary precaution. Sugar-cutting is a branch of the grocery trade of great importance, and it appears to be very much simplified by the machinery erected in this establishment by Messrs. Waygood & Co., who have supplied all the new machinery under notice. The sugar-loaves, on arriving at the cutting-floor, are stripped and taken to a sugar-saw. The loaf is placed in a cradle on one side of the saws, held tightly by a series of forks, which is done by simply turning a screw. When the machine is started, the loaf is cut into slabs in less than a minute, and may then be bodily deposited on the tray of copper. The slabs are dropped through divisions in the tray and leave the machine in perfect cubes. The machine is capable of cutting one ton and a half of sugar per day. At the end of the sugar-loaf is fixed a patent gas-heating coffee-roaster with atmospheric burner. The coffee is first placed in a steel cylinder, which is driven by a belt from shafting. The gas is ignited and the air-pumps set in motion, by means of which a clean hot flame is produced the whole length of the cylinder by the mixture of gas and air. The coffee, when roasted, is turned into a cooler, on which it is run back to the fan and cooled in five minutes, the whole process of roasting and cooling averaging about thirty minutes.

**Brentwood.**—The second part of the Warley Mount Estate, advertised for sale by Messrs. Ventom, Bull, & Cooper on the 25th inst., deserves attention. The land lies near Brentwood Station, between which place and Liverpool-street the Great Eastern Railway Company run an excellent service of about forty trains daily. The country for miles round is beautifully undulated and well wooded, affording a variety of charming views that it would be difficult to rival. From Warley Gap, within five minutes' walk of the estate, a spot well known to artists, may be seen the Thames with lying its curve past and below Gravesend, while the Kentish hills are visible for many miles. The many attractions of the neighbourhood, combined with the great salubrity of the air, have made Warley a favourite residential town, and the estate in question is entirely laid out for residences of the best class.

**Mr. T. W. Keates, Consulting Chemist and Gas Examiner to the Metropolitan Board of Works,** died on Sunday, the 7th instant, after a brief illness. He was born at Poole, in Dorsetshire, in 1817, and was, consequently, in his 65th year. He was a man of high attainments, cultivated intelligence, and great urbanity of manner. One of his last works for the Board was the preparation of a report, in conjunction with the Engineer, on the pollution of the Lower Thames by the Main Drainage Works, in reply to the report to the Thames Conservancy Board by Captain Calver, and he was occupied up to the time of his death in further analyses of the water, in anticipation of a Government inquiry. The Board loses in Mr. Keates an able and energetic officer.

**The Sunday Society.**—Next week will be one of the busiest on record in connexion with this Society. On Sunday two art exhibitions will be open—the Graphic and the Society of British Artists—tickets for which may be had on application to the Honorary Secretary. On Wednesday afternoon a national conference of representatives from all parts of the country will meet at the Westminster Palace Hotel, and in the evening a large meeting will be held at St. James's Hall, under the presidency of Viscount Powerscourt. On Thursday the Earl of Dunraven will bring the Sunday Opening Question before the House of Lords by moving the same resolution that Mr. George Howard is to propose in the House of Commons on Friday.

**Short "Quantities."**—At a meeting of the Brentford Board of Guardians on the 3rd inst., a letter was received from Mr. Monson, the architect, stating that he had received a letter from Mr. Brunson, the contractor for the new school, stating that a mistake had been made in taking out the "quantities" for the new schools; one heading, in reference to roofing, should have been marked "squares," whereas it was only marked "yards." That involved an addition of 250*l.* to the amount of Mr. Brunson's tender. Mr. Brunson had sent a letter to the same effect to the clerk of the guardians. Mr. Marshall said the letters in question had been before the Finance Committee, but they had no special report on the subject. Mr. Miller, who had made out the quantities, had been before the committee and examined, and stated that there were 119 yards 10 feet in one case where it ought to have been squares; it was the fault of the printers. But Mr. Miller's original draft of the specifications had not the word "squares" marked upon it at the place in question. He (Mr. Marshall) thought that that had nothing to do with the guardians. Mr. Miller contended that although it was not marked squares it was generally understood to mean squares and not yards. The matter was referred to the Building and House Committee.

**A Brass for America.**—Messrs. Cox, Sons, Backley, & Co., of Southampton-street, Strand, have just executed a brass in memory of the late President Garfield. It is in the style of the old brasses of the fifteenth century. At the top, on each side of the canopy work, there is represented the great seal of the United States. There are also two shields, representing the arms of the States of Ohio and New Jersey, on each side of a sword, with an appropriate and simple inscription, stating when and where he was shot and died. The brass is to be placed in the Episcopal Church at Elberon, adjoining the house in which the President died; and, although General Garfield was not a Churchman, this was the last place of worship he attended.

**The Line of Frontage Question at De Vere Gardens, Kensington.**—In the High Court of Justice, Queen's Bench Division, before Lord Coleridge and Mr. Justice Grove, Mr. Channell moved, on behalf of Mr. Elders, for a rule calling upon the magistrates of Middlesex to show cause why a mandamus should not issue directing them to hear and determine an appeal. The question involved was whether an appeal lies under certain sections of the Metropolitan Management Act with reference to the line of building, which required the demolition of the applicant's house. The Court held there was no such appeal, and refused the rule.

**City Churches.**—In the House of Lords on Tuesday the Bishop of London moved the second reading of the Union of Benefices (London) Bill, the object of which is to afford greater facilities for the removal of churches from the City proper to border parishes. Lord Onslow advocated the Bill, while thinking it did not go far enough and that it required amendment in Committee. After some lengthened criticisms on the part of Lords Carnarvon and Midleton, Lord Granville supported the motion, and the Bill was read a second time. A week or two since we mentioned the leading provisions of the Bill.

**A New Church struck by Lightning.**—The spire of the new Presbyterian Church at West Hattlepool was on the 1st inst. struck by lightning, which displaced two of the prongs of the lightning-conductor, splitting the latter in two. The current then ran downwards till it met the metal spouting, which it cracked, and fused the metal at the joint, and thence it seems to have passed into the church, where it melted one of the lead pipes for the gas supply, but did little other damage. Was the conductor fixed by men who understood their work?

**Public Offices.**—A Government Bill has been issued, the object of which is the acquisition of lands for the improvement, enlargement, rebuilding, and concentration, of the offices used as the Admiralty and the War Office. The sites affected are in Spring-gardens, Charing-cross, Whitehall, and St. James's Park. On the back of the Bill appear the names of Mr. Shaw-Lefevre and the lamented Lord Frederick Cavendish.

**On the completion of the new Wesleyan Chapel, at Richmond, S.W., Mr. C. Outway, of Barnstable, who had acted as clerk of the works, was presented with a handsome time-piece as a recognition of faithful service.**

**The Fatal Fall of a Chimney-shaft at Rotherhithe.**—The coroner's inquiry into the death of a little boy named Joseph Charles Coker, aged two years and a half, who was killed by the fall of a chimney-shaft, in Rotherhithe, during the gale on Saturday, the 29th ult., has been concluded. It appears that a shaft on some adjoining premises was blown down, carrying with it the kitchen chimney of the house in which the parents of the deceased lived. Mr. Coker, the father of the deceased, said he was not at home at the time of the occurrence. He was not surprised to find the shaft had been blown down, for he had known that it was in a dangerous state for two years. He had complained to Mr. Snooke, the Rotherhithe District Surveyor, but nothing had been done. The mortar at the joints of the brickwork had perished, and the shaft was at least 25 ft. higher than the roof of the factory. Mr. Snooke was unable to attend the opening of the inquest, owing to serious illness. The inquiry was, therefore, adjourned, but Mr. Snooke was again unable to be present. A letter written by him to the coroner was read, in which he stated that it was untrue that he had ever had his attention called to the shaft by Mr. Coker. Mr. Coker, recalled, still adhered to his original statement, and produced what purported to be a copy of the letter he had addressed to Mr. Snooke describing the dangerous character of the shaft. There was no date to the document, but Mr. Spencer, a surveyor, was called to prove that the letter was written by his adviser two years ago, in consequence of an inspection he had then made of the shaft. The fault was that the brickwork had not been properly bonded at the base. Mr. E. Thomas, surveyor to the Rotherhithe Vestry, deposed that there were hundreds of similar chimneys in Rotherhithe which had been erected prior to the Metropolitan Buildings Act, and if all were condemned that might be, half Rotherhithe would be called in question. The gale which hurled the shaft down had a pressure of 30 lb. to the square inch. The jury, after a long deliberation, recorded a verdict that the death of the child was accidental. They recommended that, in all cases the authorities should give prompt attention to all complaints of dangerous structures.

**The Rescue of Epping Forest** from the hands of the spoiler has been a long and difficult task, and the Corporation of London are deserving of all honour for the very important part they have taken in preserving the forest to the use of the public for ever. Ten years ago it would have seemed impossible that such a victory as has been won by the Corporation could by any means have been achieved. How great the victory was, says the *Times*, may be seen at a glance. In 1851 the area of the open forest was little short of 6,000 acres; in 1871 it had dwindled to just under 3,000. The district which her Majesty on Saturday last declared available for her people's enjoyment extends to about 5,600 acres.

**A Presentation.**—Mr. Robert Brown arrived at his seventieth birthday on Sunday last, and to commemorate the event some of his admiring friends presented him with a set of books, handsomely bound, inclosed in a carved oak case, designed and well carved by Mr. Geo. Alfred Rogers. The carving included emblems of the "Ring and the Book," "True Good News from Ghent," "Red Cotton Nightcap Country," "The Glove," "The Gondola," "The Star," "Music and Painting," and "Bell and Pomegranates."

**The Cripples' Home.**—On this Friday, the 12th inst., H.R.H. the Princess Louise is to open the National Industrial Home for Crippled Boys, Wright's-lane, Kensington, which has been constructed and added to by Mr. E. C. Robin architect. We gave some particulars of a building two or three months ago.

**Sproton Church, near Melton Mowbray.**—Thirteen tenders have been received for restoring in oak, erecting new organ-chamber and vestry, &c., for the above church, for the Rev. A. W. Booker. Mr. H. Woodley is the architect. The tender of Mr. Thos. Woolst, contractor, of Stamford, has been accepted.

**Charlestown.**—A new organ-chamber, vestries, and organ have been added to the Independent Chapel, Charlestown. The alterations and organ-case have been made by Mr. Ramsbottom. The organ has been constructed by Messrs. Jardine & Sons. The works have been carried out under the inspection of Messrs. Maxwell & Take.



**Oldham and its Improvement.**—The *Oldham Express* of the 6th inst. devotes No. xxvi. of its articles on "Local Celebrities" to the life and professional career of Mr. Thos. Mitchell, F.R.S.E., the architect of the New Free Library, the foundation-stone of which was laid on the day above named. In this building, by the way, concrete is being largely used for the walls. The *Express* asks,—"How long will it take to make Oldham into a model town?" "There could scarcely be a more unpromising situation in which to try the experiment; but we suppose Oldham is where it will have to remain, and, therefore, our policy is to make the best of what we have. In the first place, Manchester-street requires to be relieved of its present excessive vehicular traffic. Only trams and passenger conveyances ought to be allowed to traverse it, except in cases of necessity. To make this possible, Union-street requires to be carried along Union-street West at the same level, and so on to Napier-street right to the Werneth Park wall, where it might take a slice off the Park, and thus widen Manchester-street sufficiently to allow for double tram-lines. When this road was made, there would be no necessity for heavy wagons and lorries to pass through the town, and by cutting a corner off here and another there Manchester-street might be so widened all the way up as to allow room for double lines of trams, thus dispensing with the loop-line along Union-street. Oldham is certain to grow, and it will require more lung space. An attempt ought to be made to preserve all the open spaces still available in the borough. There ought to be a park on Oldham Edge, one in Ripponden-road, and one on Werneth Brow. A theatre ought to be built at the top of Waterloo-street, opposite the Old Mess House, which ought to be carted away; and then, with St. Peter's Church pulled down and the site of the graveyard flagged over for a playground for the children, we might rest content with having done our best out of the unpromising materials at hand."

**London Water Supply.**—Mr. J. F. B. North, M.P., writing in *House and Home* on this subject, says:—"The average amount of water delivered by the companies in 1880 was 42,000,000 gallons per day, being an increase of nearly 8,000,000 gallons on 1879. Of this amount, more than 71,000,000 gallons were, we are informed, sometimes "grossly polluted by sewage matters." More than 61,000,000 gallons were "occasionally so polluted," and less than 1,000,000 gallons were uniformly of excellent quality for drinking. These figures are an eloquent condemnation of the policy of purchasing, at an exorbitant rate, so imperfect a supply. It is noted that the impurity is increasing, and was greater, both proportionately and actually, in 1880 than during any year since the analyses began in 1868. Dr. Frankland also states that the water of the Thames and the sea is becoming every year less suitable for domestic use. This condition of things is most serious, as it is admitted on all hands that the supply of water is essentially a municipal function. It is an article of primary necessity, and upon its pure and sufficient supply depends to a large degree the health of the town. Under various Acts of Parliament, ending with the Metropolitan Water Act, 1871, the water companies are subject to public control, and they have expended large sums of money in competing systems of filtration, but from the nature of the river water with which they have to deal the result has been always unsatisfactory, and,—as the Rivers Pollution Commissioners say,—no process has yet been devised of cleansing water once contaminated with sewage so as to make it fit for drinking. If, therefore, the citizens of Greater London purchased the existing water supply, one of the first duties of the purchasing authority would be to initiate a fresh supply for potable purposes."

**Philharmonic Theatre.**—Mr. Frank Matthews, of Rugby-chambers, Bedford-row, is preparing plans for the entire reconstruction of the Philharmonic Theatre, Islington. Accommodation will be provided for 2,500 people. The electric light is proposed to be used for illuminating the building.

**Messrs. Merrick & Sons, of Glastonbury,** are contracted to restore the parish church at Hartpree. The restoration was planned by late Mr. G. E. Street, but will be carried out under the superintendence of Mr. J. D. Sedding, of diocesan architect.

**Compensation Case.**—In the case of Dnncombe and Williams v. The Commissioners of Sewers, a claim was made by the freeholders for 12,000*l.* as compensation for the compulsory acquisition of the Cock Tavern (celebrated for its literary associations), which is required for the widening of Fleet-street, between Canvey-lane and the new Royal Courts of Justice. Mr. Elcort and Mr. G. W. Hailes gave evidence in support of the claimants' case. For the Commissioners of Sewers it was contended that the witnesses examined had placed the value far too high, and that at the very utmost 8,000*l.* would be sufficient compensation. Mr. Orgill, Mr. Belton, and others were called in support of this valuation. After a short consultation, the jury awarded 9,000*l.*

**he "Burt" Competition at the Worshipful Company of Shipwrights' International Competition Exhibition, Fishmongers' Hall, London, E.C., opened by his Royal Highness the Duke of Edinburgh on the 2nd of May, 1882.**—The "Burt" Prize of 50*l.*, given by Mr. Ex-Sheriff Burt, J.P., for the best system of ventilation for ships, was gained by Messrs. Robert Boyle & Sons, ventilating engineers, 64, Holborn Viaduct, for their system of ventilation.

**Measures Bros. & Co.,** in consequence of the increased demand for constructional ironwork, have found it necessary to make further extensions, and for additional office accommodation have arranged to remove to larger and more convenient premises, No. 57, Southwark-street, within a few doors of the present offices. In the drawing-office, and the several offices for the other departments, they have made such arrangements as will enable them to meet the wishes of their employers with promptitude.

# TENDERS

For alterations and additions to the Norfolk Arms, North End, Fulham, for Mr. Bishop. Mr. W. H. Smith.....21,638 0 0  
J. E. Smith.....1,410 0 0  
H. Smith.....1,384 0 0  
R. & W. Pickersgill (accepted).....1,330 0 0

For completing No. 33, Cadogan terrace, for the Cadogan and Hens Place Estate. Mr. T. Heygate Vernon, architect:—  
T. Price & Co.....22,038 0 0  
W. Dr. ....1,034 0 0  
Geo. Shaw.....1,810 0 0  
W. Whitau.....1,777 0 0  
E. Francis.....1,484 0 0  
C. Hunt (accepted).....1,675 0 0

For taking down and rebuilding the Crown Tavern, Essex-street, Strand, for Messrs. Whitbread & Co., Mr. R. E. Woraley, architect. Quantities supplied:—  
Brigman.....23,857 0 0  
Langland & Way.....3,787 0 0  
Oakley.....2,735 0 0  
Rider.....3,678 0 0  
Macey.....3,975 0 0  
T. Little.....3,274 0 0  
J. Beale (accepted).....3,464 0 0

For the Evans Memorial Chapel, for the Home and Colonial School Society, Gray's Inn-road, King's-cross, Messrs. Shoppe, architects. Quantities by Mr. Sidney Young:—  
Langland & Way.....23,167 0 0  
Kirk & Randall.....2,060 0 0  
Campbell.....1,870 0 0  
Macey & Sons.....1,949 0 0  
B. Cook.....1,933 0 0  
E. Le-Rance.....1,923 0 0  
H. Barman (accepted).....1,687 0 0

For additional class-room to All Saints' Schools, Nottingham. Mr. Frederick Jackson, architect. Quantities supplied:—  
Bell & Son.....2,383 0 0  
R. Middleton.....365 0 0  
Geo. Cowser.....318 0 0  
Marriot & Warraby.....314 0 0  
A. B. Clarke (accepted).....302 0 0

For alterations and additions at the Fountain Tavern, Blackman-street, Borough, for Mr. H. Heil:—  
J. Beale (accepted).....2,392 0 0

For cabinet and counter fittings at the White Horse Tavern, Pople Park Estate, Parson's-green, Fulham, for Mr. Wm. Chapman. Mr. Geo. Trescher, architect:—  
J. Beale (accepted).....2,570 0 0

**Glass Work.**  
J. Hattersley (accepted).....186 0 0  
For rebuilding No. 122, Brick-lane, Bethnal-green, and building shop in rear, for Mr. Griggs. Mr. A. Stanton Cook, architect:—  
Thomson & Son.....2,675 0 0  
B. Wire.....680 0 0  
J. F. Sargent, Hackney (accepted).....548 17 6

For the erection of Presbyterian Church and schools East Hartlepool. Mr. T. Lewis Banks, architect. Quantities by Mr. J. Sargent:—  
Robson & Son, Durham.....20,487 0 0  
Cochburn.....5,646 15 0  
Sugget & Sons.....5,830 0 0  
Bulmer.....5,623 0 0  
G. Harrison.....5,331 0 0  
J. Johnston, West Hartlepool.....5,260 0 0

For the erection of new vestries and organ-chamber, new aisles, and lengthening the nave of Rothampton Church. Mr. A. W. Blomfield, architect. Quantities by Mr. S. Tucker:—  
Chapell.....22,749 0 0  
Dove Bros.....2,375 0 0  
Aries.....2,623 0 0  
Adamson & Sons.....2,555 0 0  
Harris.....2,420 0 0  
Gregory.....2,295 0 0  
Avis & Co.....2,240 0 0  
Parmenter.....2,050 0 0

For additions and alterations to The Hall, Beshey Mr. Herbert Keirle, architect. Quantities by Mr. Edward Crutchley:—  
Turner.....27,799 0 0  
Boyes.....7,487 0 0  
Dove Bros.....7,375 0 0  
Waverman.....7,150 0 0  
Clifford & Gough.....7,100 0 0  
Smith.....7,000 0 0  
Miskin.....6,594 0 0  
Gregory.....6,495 0 0  
W. King & Sons.....6,285 0 0  
\* Accepted subject to reductions.

For alterations and additions to the Northampton Brewery Company's premises at Northampton, for Mr. S. L. Seckham, Messrs. Samell & Ojler, architects. Quantities supplied by Messrs. B. L. Curtis & Sons:—

**Buildings.—Contract No. 1.**  
Separate estimate for paving to old portion. Total.  
J. Garlick.....242.5 0  
G. Heap.....3,523 0  
J. Gustord.....3,149 0  
H. Lovatt.....3,018 0  
R. Hunkley.....3,002 0  
J. Watkin.....2,930 0

**Boil-ers.—Contract No. 2.**  
Bells & Co.....21,150 0 0  
Forester & Co.....1,978 0 0  
Pigott & Co.....1,560 0 0  
Horton & Sons.....1,543 0 0  
Thornwell & Warham.....1,423 0 0

For new roads, sewers, and surface-water drains, for the British Land Company, Limited, on their estate at Ley in Hall. Mr. Henry B. Michel, surveyor:—  
Crockett, St. Pancras.....22,125 0 0  
Dunmore, Horsey.....1,963 0 0  
Harris, Camberwell.....1,888 0 0  
McKenzie & Co., Finsbury.....1,883 0 0  
Pell, Bromley.....1,789 0 0  
P. & J. Horsey.....1,320 0 0  
Keeble, Regent's Park.....1,234 0 0  
J. Bloomfield, Tottenham.....1,189 0 0  
Jackson, Leyton.....1,111 0 0  
Wilson, Walthamstow (accepted).....998 0 0

For alterations, &c., to house, at Kingston, for Mr. E. G. Saunders. Mr. R. Carter, architect. Quantities by the architect:—  
J. B. Woods.....2,798 0 0  
Lidstone.....785 0 0  
Nisbett.....790 0 0  
Falkner.....787 0 0  
Jatt.....785 0 0  
Oldridge.....780 0 0  
Parker.....749 0 0  
B. & V. ....739 0 0  
Osborne.....719 0 0  
Parker & Co.....715 0 0  
Ferguson.....7.8 0 0  
Williams.....690 0 0  
Ternman.....685 0 0  
Everett.....660 0 0  
Presley & Gurney.....633 0 0  
Johnson.....615 0 0  
Cussey.....640 0 0

For sundry alterations at No. 452, Bethnal-green-road. Mr. F. W. Forge, architect:—  
Clever.....2,219 0 0  
Trent Bros.....211 0 0  
J. Jarvis & Sons (accepted).....190 0 0

For rebuilding No. 242, Bethnal-green-road. Messrs. Isaacs & Florence, architects:—  
Boyd.....2,150 0 0  
Kilby.....1,335 0 0  
J. Jarvis & Sons.....1,378 0 0  
Stimpson & Co.....1,227 0 0  
Scribner & Co.....1,195 0 0  
Ternman.....1,165 0 0  
Wire.....1,150 0 0

For raising portion of Rotherhithe Infirmary, for the Guardians of St. Olave's Union. Messrs. H. Saxon Snell & Sons, architects:—  
W. B. Brown.....23.9 0 0  
Crockett.....290 0 0  
Brockwell.....280 0 0  
Bamford (accepted).....257 1 0

For painting, whitewashing, &c., at the St. George's Union Infirmary, Fulham-road, for the Guardians of St. George's Union. Messrs. H. Saxon Snell & Sons, architects:—  
Teer.....2,450 0 0  
Dery.....438 0 0  
McCaffrey.....320 0 0  
Fleming.....310 0 0  
C. Wall.....300 0 0  
Stephenson.....299 0 0  
Morris (accepted).....291 0 0  
Scott.....247 0 0  
Dunsford & Clutter.....212 0 0

For forming well-room, &c., at St. Luke's Workhouse, for the Guardians of the Highbury Union. Messrs. H. Saxon Snell & Sons, architects:—  
Howard.....234 0 0  
Crockett.....230 0 0  
Wall Bros.....223 0 0  
Bamford.....220 0 0  
Gainsford.....223 0 0

For alterations and additions to Cullingworth Manor House, Shopshire. Mr. Robert Wiley, architect:—  
Wale, Ludlow (accepted).....21,200 0 0







# The Builder.

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### Thausing's Life of Albert Dürer.

HOUGH we may regret that so much of the best artistic biography in our language consists in translations, and not in original work, we are glad to have in any form a more full and learned life of Albert Dürer than the slighter biographies existing in our language, especially as in England, except among a few persons who have given special study to him and his works, there hangs about his name and life a certain degree of glamour and mystery; he is a great name, concerning whom people know very little. His fine impressive head, with its masses of curling hair, coupled with the character of many of his designs, suggests vaguely the idea of something very romantic in his life and character, an idea which his detailed biography does not bear out, his character and social circumstances having been, on the whole, matter-of-fact enough. We have no translator's name to the biography before us,\* it is "edited" by the Secretary of the Royal Academy, from whose preface it appears that the translation has been a work of co-operation, having been rendered a difficult task by "the abstruse and often involved style peculiar to much of German literature," and the number of technical terms which had to be represented as nearly as possible by English equivalents. Dr. Thausing's work has attained a high position in German artistic biography, having been the result of much time and careful study, by a writer who had special opportunities of studying Dürer's paintings, and who has also made Dürer's letters and personal traits, as far as they are on record, a matter of careful inquiry. The translation reads well and smoothly, and, if it correctly represents the original, may be called a very successful specimen of the difficult art of reproducing a book in another language so as to be at the same time accurate in its representation of the original meaning, and readable as an English book.

The introductory chapter goes into some of the social and intellectual conditions under which German art was carried on just before the days of Dürer. According to Herr Thausing, Nuremberg, seated between the essentially priestly city of Cologne and the essentially regal, or rather imperial, city of Prague, escaped the extreme influence of either form of government, and was pre-eminently the free city of a self-reliant higher community, who were not bound to carry out art in forms

calculated to please and satisfy either priestly or courtly influences. They took their own views, and followed freely their own paths, and the work which they most especially aimed at, perhaps rather instinctively than deliberately, was to give to the human figure and countenance the expression of the inner life of the time. Not merely to represent them with outward correctness. "The importance of Van Eyck's innovation," says the author, "consisted chiefly in two things: the introduction of landscape into pictures, and the development of individuality of form and expression in the human countenance;" and he comments on the radical distinction between early classic art, which modelled the naked human body in different attitudes expressive of action without making any alteration in the expression of the features, and the tendency of modern art, which began with the study of the human countenance, and occupied itself with the expression of the face in the first instance, and the figure only in a secondary and, for a long time, in a tentative manner. This tendency to regard what may be called spiritual expression as of the first importance in painting, Herr Thausing seems to regard as especially developed in Nuremberg in consequence of the free life there which disposed men to take up and work out new ideas, and the strongly developed moral feeling and earnestness which characterised the life of the people and made itself felt in their art. This earnestness, it is true, is to be looked for beneath rather than on the surface; for the superficial life of the Nuremberg of Albert Dürer was coarse enough in its minor characteristics, and Herr Thausing's life brings out a side of Dürer's manner and character which will to many seem rather a startling contrast to the ideas commonly associated with his name as that of a great religious painter. But beneath this superficial roughness there was a substratum of seriousness which comes out in the paintings of Dürer, though not in his letters. "Without being strictly ecclesiastical, the school of Nuremberg was deeply religious, and without renouncing the truth, it remained elevated and full of warm feeling. It did not certainly attain to purely formal beauty according to modern ideas, or did so only conditionally, for it aimed higher. German genius is not satisfied with mere external charms if it cannot bring them into harmony with the aspect of the inner life. The idealism of German painting consists in this struggle to give expression to deep and mysterious inward feeling." It may be said that there has been in German art of every kind rather too little of external beauty and too much of "inner consciousness," and this is certainly to some extent the case with Dürer, whose figures, at all events, are seldom, in the material sense, beautiful, though he often shows great richness of effect and fine design in the execution of accessories.

Another influence on the German art of Dürer's time existed, Herr Thausing considers, in the position which just then began to be

taken by wood and copper engraving as a means of popularising art, and even of conveying instruction. The little opportunity afforded for wall painting, or even easel-painting, on a large scale in Germany, as compared with Italy, drove the German artists very much in the direction of engraving, and the method of the manipulation carried on in line engraving insensibly influenced their style even in painting. But a more important result of the growth of engraving lay in the power which it gave the artist of appealing to a large public, more especially in illustrated books, wherein, in many cases, the illustrations assumed a great importance in comparison with the text, which was little more than an excuse for them. Thus, as Herr Thausing puts it, "labouring for a great impersonal public contributed materially to raise the artisan into the artist. By appealing to it he could relieve himself from any pressure which might be put upon him by his employer. The painter could venture to follow out his own inspirations in his designs for engravings on copper and wood, sure that a congenial people would understand them. The fact that he usually was at the same time his own printer and publisher must also have been favourable to his worldly prosperity. For the security of the property thus created he placed a mark or monogram upon his work, and a well-regulated community, such as Nuremberg, watched carefully over the inviolability of these rights. The monogram at first was only intended to indicate that the author had an exclusive right of sale. It was the modern conception of personality, the thirst for fame characteristic of the Renaissance, which added to this meaning the idea of an intellectual property." We confess we should take this statement *cum grano*. The monogram being placed so conspicuously as it usually was by Dürer and others may no doubt have been, to some extent, a matter of business, a trademark, and Herr Thausing's suggestion to that effect certainly throws an interesting new light on the subject, and on our notion of the relations of Dürer and his contemporaries with their public; but that there was no idea of intellectual property in the design, and no desire for intellectual representation in connexion with it, we should very much doubt. It is true that the Renaissance gave a great impulse to the desire for fame, and in regard to architecture it introduced a personal element which had before lain almost entirely dormant; but we do not imagine there has been any time in which art worth speaking of has been produced, in which there was not, on the part of the artist, the desire for personal fame and recognition. The feeling is innate in human nature, and perhaps in artistic human nature above all.

Without attempting to go through the details of the life of the painter as presented in these two volumes, we may touch upon some of the points in regard to which Herr Thausing appears to have thrown special light on the circumstances, character, and career of Albert Dürer

\* Albert Dürer: his Life and Works. By Moriz Thausing, Professor in the University of Vienna, and Keeper of the Albertina Collection. Translated from the German. Edited by Fred. A. Eaton, M.A., Oxon, Secretary of the Royal Academy. With illustrations. London: John Murray, 1892.





The first of these is in reference to his domestic circumstances. It has become an accepted belief that Dürer suffered much from a tyrannical and scolding wife. Herr Thausing is very anxious to rescue the wife of Dürer from this reproach. There is evidence, at least, that it was a marriage of affection on Dürer's part, and that the lady possessed (for a Dutch lady) no inconsiderable personal charms. According to our author, the whole story as to her Xanthippe-like character rests upon a single letter of a certain Pirkheimer, a respectable and wealthy citizen of Nuremberg, written shortly after Dürer's death. Pirkheimer had been a friend and constant correspondent of Dürer's, and must have known about as much of his private life as any one could who did not live actually in the family. His accusations against the wife are given in plain and unmeasured terms, and denounce her as having shortened Dürer's life by her ill-temper. The explanation given by the author is that Pirkheimer was a sour-tempered old virtuoso, who was outraged against Dürer for having given away or otherwise disposed of certain curiosities among the relics of Dürer, which he, Pirkheimer, had coveted. It appears that there was a taste just then in Nuremberg for the possession of stage antlers, which formed the analogy to the blue china of our own day; and Dürer had a particularly fine pair which Pirkheimer had wished to purchase. That Pirkheimer was very enthusiastic on this subject of antlers is evident enough. He says he would have given anything for a fine pair, and "Albert Dürer had one beautiful pair, which I should dearly have liked, but she (Dürer's wife) has secretly given them away, together with other beautiful things, for next to nothing." This statement, it may be observed, discredits another charge of Pirkheimer's against Agnes Dürer,—that she was grasping and avaricious,—and does, therefore, tend to throw some doubt upon the correctness and fairness of his statements. At the same time, it appears to us that it is rather a large demand to make upon the reader's credulity, that he should translate all this testy but respectable gentleman's very emphatic charges against Dürer's wife for ill-temper, into venation at not getting something which he wanted from among Dürer's relics. The venation may have tended to induce him to air his feelings about her, but it hardly seems very probable that it would have led him to actually inventing charges which there was no ground for, and we must regard the fact of Albert Dürer's domestic discomfort as still among the probabilities; and the rather as the author admits that there is no extant testimony in favour of the wife's character and temper, to set against Pirkheimer's positive evidence.

In regard to the sources whence Dürer drew his characteristic and strongly-marked style, the author regards him as indebted directly to only one artist, Wolgemut, whose pupil he was, and who had, after considerable absence from his native town, Nuremberg, returned to it with a style much influenced by that of the Van Eycks, and which in its turn influenced his pupil Dürer, who may thus have been regarded as the artistic descendant at second-hand of the Van Eycks. Wolgemut, though his name is little heard of now, had an immense reputation at the time, and a great number of commissions, and there is sufficient evidence adduced by Herr Thausing both that Dürer regarded him with great respect, and that he consciously imitated the style of his master. Dürer's father, as is well known, was a goldsmith, and Dürer was to be brought up to the same craft, and actually learned and worked at it for some time during his boyhood, until his own expressed preference for painting led to his being removed to the studio of Wolgemut, rather unwillingly on the part of his father, who (not unnaturally, perhaps) seems to have grudged the time lost in the goldsmith's work, which was now to be abandoned. It does not appear, however, probable that Dürer's apprenticeship as a goldsmith influenced his style of painting at all, or that he looked upon it as an art in the same category as the art of painting, and which might be practised simultaneously with painting, as some of the great Italian artists evidently regarded it. On the contrary, there is his own direct and written definition of painting as the art of representing things in relief on a flat surface, and which he evidently considered as an *art sui generis*, and of a higher type than any other, although his definition seems to include what is sometimes distinguished as the art of design, on a different footing from painting

properly so called; and the evident delight which he took in drawing the rich and bold ornamental accessories frequently found in his engravings seems to show that his interest in this branch of drawing was very great. There is evidence also that he studied perspective systematically, and attached great importance to it.

We must regard Dürer, therefore, as essentially a draughtsman, by his own choice, and, as on the whole, repudiating or passing over what are called the lesser arts. It appears that he occasionally made designs for ornamental objects, or at least sketches, for a facsimile of a design for a fountain is given by Herr Thausing, who expresses great admiration for it. We only see in it a sketch of what would have proved, if executed, a very poor, thin, and ineffective piece of work; and it is certainly remarkable how tame is the hand of the same artist in making a design of this kind, in comparison with his force and freedom in the higher class of design.

In the outset of his career as a painter, or what is now somewhat awkwardly called a "painter-engraver" (i.e., an engraver of designs of his own origination), Dürer must have been not a little influenced by the state of social and religious freedom of Nuremberg in the choice and feeling of some of his earlier subjects. Nuremberg was anti-papistical, and, in fact, opposed to every form of domination which interfered with freedom of thought and freedom of action. The author mentions the audacious and somewhat coarse pictorial satires on the Papacy which were executed by Wolgemut about the time that Dürer was commencing his career as an artist, and were openly published with the artist's signature or "trade-mark" upon them connecting them with his own studio; a course which Herr Thausing thinks would hardly have been possible anywhere at that time except in free and independent and wealthy Nuremberg. He notes as significant the fact that at this very time Dürer was engaged in the same city on his designs in illustration of the Apocalypse, a book from which so much of the more serious satire against the Church of Rome was taken. There is, in fact, without any direct expression of it, a strong underlying Protestantism in these designs. The conventional figures of church saints and hierarchs, which the painters of Italy adopted in obedience to the prevailing influence of the ecclesiastical idea, are replaced in Dürer's designs by vigorous and almost naturalistic figures, in which he seems to seek to give, in his own peculiar mixture of ideal action with the realistic costume of his own day, the broad force and meaning of the allegory, without bringing it in any special way into the sphere of religious or ecclesiastical painting. This is, perhaps, one of the most noticeable among several points of resemblance between Dürer and Michelangelo; both are, in the treatment of sacred subjects, for the most part so wholly independent of ecclesiastical influence and ecclesiastical feeling, so large and free in their reading of the subject.

One of the most interesting chapters in the Life is that which treats of Dürer's second visit to Venice about 1505. It is suggested that one cause of his wishing to be in Venice about this time was the fact of the rebuilding of the Fondaco dei Tedeschi, the German Exchange, which was ultimately decorated externally by Titian and Giorgione, and in which Dürer might have wished to have a hand. The very idea of Dürer among the Venetian artists is interesting, and suggests all kinds of fancies in regard to the reciprocal influence on each other of the Venetian painters and himself. Dürer had considerable reputation in Venice already, but it appears that his work there was chiefly in executing commissions for the German residents, especially an altar-piece for the Church of San Bartolomeo, which was the German church of the city. Dürer complains in one letter to his friend Pirkheimer, however, that it was not very paying work, and that if he had not bound himself to execute this work for the Germans he might have made much more in commissions from the Italians, who, he says, came to see him in such crowds that he was forced sometimes to hide himself. "All the nobles wish me well," he adds, "but few of the painters," a position which does not seem to have been unsatisfactory to Dürer. One of the painters with whom he was, however, on very friendly terms was the aged Bellini, who, having made his reputation and finished his career, could perhaps better afford to look with complacency on the great Ger-

man rival than could the younger artists of the Venetian school. A story is related concerning him and Dürer, the latter being Dürer himself, that Bellini asked, "as a special mark of affection, for one of the brushes used by Dürer in painting hair. Dürer held out to him a number of ordinary brushes, and told him to choose one, or take them all if he liked. Bellini, thinking Dürer had not understood him, again asked for one of the particular brushes with which, as he thought, Dürer was accustomed to do his fine hair painting. On this Dürer assured him that he used nothing but the ordinary brushes, and to prove it painted on the spot a long lock of woman's hair in his peculiar manner. Bellini is said to have acknowledged to several people afterwards that he would never have believed it if he had not seen it with his own eyes. The story is very characteristic of Dürer, and he was just the man to take pleasure in repeating it."

Dürer, in fact, in spite of the popular idea which his grand and serious countenance, and the melancholy and sombre feeling of much of his work has given rise to, was by no means a grave, serious, or very high-minded man, apart from his art, but was a thorough man of the world, looking carefully after his money-matters, enjoying his fame, fond of dressing, and somewhat vain about his appearance, and given to indulging with his friend Pirkheimer and others in exceedingly coarse and even obscene "chaff." The extent to which this was carried is shown in the joke written in Greek on Pirkheimer's portrait, which is given in its Greek form, but which, as the translator most truly says, could not be translated into English. Of course, these were the ways of the time, and no one would attach too much importance to them; but it is, nevertheless, curious to find how much the realistic portrait of a great artist in his social capacity may differ from the ideal of him which his works would suggest. In his art, he seems at these times we have been last speaking of to have been perfectly assured of his own position and exceedingly independent of any other opinion. He observes in one of his letters from Venice that many painters there stole from his engraved works, and appropriated his ideas, and then afterwards, he adds, "they find fault with it, and say it is not like antique art, and therefore not good." From the indifferent way in which he makes this remark, Dürer seems to have felt himself quite out of the reach of being shaken in his own confidence in himself by any such criticism. He had taken a path of his own, and had full reliance on his being in the right way. The position which he really took in the art is well summed up by the author in a paragraph immediately following that from which the last reference is taken. "After feeling his way long and anxiously between tradition and nature, he had found a language fitted to express the deepest feelings of his soul; and with a mighty effort he drew together within one harmonious circle the opposite poles of that disturbed age, its faith and its knowledge. The full stream of Christian feeling and devotion was poured by him into a thousand new forms, taken from the life, and of which German sentiment alone could appreciate the full depth and meaning. The stepping-stones of Italian Renaissance, the lightly-tied leading-strings of the antique, were discarded and thrown aside, and unaided he reached that perfect and matchless manner of representing scenes of sacred history which has since become typical, and in which the whole modern world has found profit and edification."

#### MR. C. J. FREAKE, OF SOUTH KENSINGTON.

The *London Gazette* has announced that the Queen has been pleased to direct letters patent to be passed under the Great Seal, granting the dignity of a baronet of the United Kingdom of Great Britain and Ireland unto Charles James Freake, of Cromwell House, in the parish of St. Mary Abbots, Kensington, and Fulwell Park, in the parish of Twickenham, both in the county of Middlesex, Esq.

All who are acquainted with Sir Chas. Freake's long and honourable career, and his many acts of wise liberality, well seconded in these as he has been by Lady Freake, will hear with pleasure of the bestowal of this mark of honour. Personally, as to old and valued friends, we offer them our heartiest good wishes.



## THE A B C OF THE ELECTRIC LIGHT.

## GALVANIC ELECTRICITY.

Or the countless thousands of wayfarers who pass along the Thames Embankment, over Holborn Viaduct, or through any other London thoroughfare lighted by the electric light, and admire the latest triumphs of electricity in this direction, perhaps not one in a hundred thousand has the remotest notion of the way in which the marvel is accomplished.

The better educated portions of the crowd have a vague idea that the electricity is generated somehow or other by a steam-engine, and their memory very possibly harks back to the days of their boyhood, when they used to be taken to the Polytechnic Institution to see alarming sparks of electricity bred before their eyes by rows of shrieking steam jets; but they are victims of a false analogy. They also know that, like the force that carries their messages to the bounds of civilisation, the electricity that feeds the electric light is conveyed along the streets through wires; but here their knowledge ends. The same remarks may be applied to nearly the whole body of architects, who in their younger days very naturally never thought of paying the slightest attention to the science of electricity, little dreaming that its latest outcome—a brilliant, cheap, safe, and wholesome illuminating agent—would one day form an important factor in the art of construction.

Some of the more adventurous of our readers may have determined manfully to "read up the subject," and have consequently dipped into a few books on electricity, but only to find themselves totally bewildered by a confusing mass of words, such as "tension," "potential," "ohm," "cathode," and "electrostatic," which most effectually quench their ardent thirst for knowledge. The fact is that manuals of electricity are written either for technical men or for scientific students, who have already gone through a certain amount of training, and not for popular reading.

The principles which govern the production of the electric light are exceedingly simple, although the machinery by which they act are comparatively complicated. The object of the present article is to explain these principles to the unsentient reader in the terms of every-day life. It would, of course, be out of place in a journal like the *Builder* to go very deeply into the matter, or describe in detail the numerous machines and lamps at present in use, but as any intelligent person may understand the principles upon which the steam-engine works without knowing the name and purpose of its every wheel and lever, so let us hope that it may be equally possible to make those who may at any time be called upon to fit up a building with the electric light acquainted with the principles that govern its production.

Electricity as a force was first known to Theophrastus (384-287 B.C.), who found that when yellow amber (*electron*) was rubbed with silk it attracted light substances. As far as the electric light goes, this cardinal fact lay fallow for nearly 2,000 years, until 1708, when a Dr. Wall, an English physician, found that by rubbing a long thick piece of amber with a silk fabric it emitted sparks accompanied by a peculiar crackling. Dr. Wall, therefore, was the first philosopher to produce light by the aid of electricity. The kind of electricity by which he produced these effects differs considerably in its qualities from that generated by either a galvanic battery or a magneto-electric machine; it may, therefore, be dismissed with the remark that its effects are momentary, whereas those of galvanic electricity are constant and continuous. There is no practical analogy, therefore, between Sir William Armstrong's hydro-electric machine at the Polytechnic, which generated electricity by the friction of a jet of steam against the sides of a boxwood tubular plug, and the machines used for working the electric light. The force in both cases is identical, but it is manifested in a different manner. The effects of frictional and galvanic electricity may roughly be compared to those of a gas explosion and a gas engine. In the one case the force of the combustion is spent in a moment, and with terrific violence; in the other, ignition takes place quietly, and the force generated exerts itself continuously. A more homely illustration may be found in a red-hot poker and a foot-warmer. The force is the same, but its origin and effects are different.

There is, perhaps, no more striking instance of the influence of apparently fortuitous cir-

cumstances on the progress of science than those which led to the discovery of galvanic electricity. Arago, in his panegyric on Volta, says "this immortal discovery arose in the most immediate and direct manner from a slight cold with which a Bolognese lady was attacked in 1780, for which her physician prescribed,—frog broth!" The lady was the wife of Dr. Galvani, Professor of Anatomy at the University of Bologna. Frogs were provided, killed, skinned, and their hind-quarters chopped off. The cooking of the broth appears to have been carried on in the Professor's private laboratory, and Madame Galvani, who was superintending the operations, was surprised to see the legs of the dead frogs twitch violently every time an assistant took sparks from a frictional electrical machine which stood close by. The lady told her husband, who repeated the experiment, with the same results. At that time Galvani was full of a theory that muscular force was electricity, and he saw in the twitching of the frogs' legs the confirmation of his views. Madame's cold still continued, and frog broth became a standing dish in the Galvani household. On one occasion the frogs' quarters were hung on an iron balcony by copper hooks, when, to Galvani's astonishment, the muscles again began to quiver, although no electrical machine was near. Galvani immediately jumped to the conclusion that his theory was proved, and that the electricity which moved the dead muscles of the frogs' legs originated in the muscles themselves,—a theory which the gentle old philosopher adhered to most manfully until the hour of his death.

The illustrious Alessandro Volta, who was then Professor of Natural Philosophy at Como, and had already distinguished himself by several capital discoveries connected with frictional electricity, repeated Galvani's experiments, and speedily demolished his theory of muscular electricity by showing that the same effects could be produced without the use of muscular fibre at all by uniting the edges of two dissimilar metals with a piece of damp cloth between, and that the muscle produced electricity, not because it was muscle, but because it was damp.

In 1780 Volta discovered the voltaic or galvanic pile, the venerable father of all the galvanic batteries that have since been invented. It consisted of a number of discs of silver, zinc, and damp cloth piled one upon another in regular order,—silver, zinc, cloth, silver, zinc, cloth, until the column consisted of twenty or thirty pairs of metallic plates with damp cloth between each pair. By connecting the top and bottom plates by two wires Volta obtained all the effects of frictional electricity in a milder but continuous form. Finding that, as the cloth discs became dry the electric current rapidly diminished, Volta tried to obtain the same effect by immersing plates of silver and zinc in water, and succeeded perfectly. His first experiments were tried in coffee-cups, which were arranged in a circular form; hence his first battery as distinguished from his pile was named by him *la couronne de tasses*.

Figure 1 is a section of a single cell of a galvanic battery. Z is a zinc plate with a wire WW attached. C is a similar plate of copper, also with a wire WW attached, both of the plates being immersed in acidulated water, the level of which is shown by the dotted line. This arrangement fulfils the law laid down by Volta, that when two plates of dissimilar metals are immersed in a liquid, and joined by a wire, electricity is generated on the surface of that metal which is the most easily acted upon chemically by the liquid, and flows through the liquid to the other plate which acts as a collector. In fig. 1 the zinc plate Z is more easily acted upon chemically by the acidulated water in the trough, the electricity emitted from its surface being taken up by the copper plate C, the current circulating round and round in the direction of the arrows. If the wires are disconnected the current immediately stops, its flow being thus interrupted.

We may learn more of the action of the gal-

vanic battery from a few simple experiments which are within the reach of every one than by pages of explanation.

Place a clean slip of roofing zinc,—say 2 in. by 1 in.,—on the upper part of the tongue, and an iron key or nail underneath the nubby member, taking care not to let the metals touch. As long as the key and the zinc are separated no apparent effect will be produced, but join them and a peculiar tingling sensation will be felt in the tongue, accompanied by a metallic or saline taste, which will be repeated every time the two metals are joined. In this simple experiment lies the whole principle of the production of current or galvanic electricity. The experiment fulfils Volta's conditions. The saliva forms the liquid representing the water in the vessel (fig. 1), and, acting on the zinc more energetically than on the iron, an electric current is set up, which circles round and round from the zinc to the iron through the tongue and saliva, and so back to the zinc again. In passing through the tongue the electricity stimulates the nerves of that organ, and in its passage through the saliva slightly decomposes that liquid and gives rise to the sensations described.

We may vary the experiment by washing the mouth out with strong brine or vinegar, and shall find that the electrical action is more energetic than with plain saliva. The reason of this is that the salt or vinegar acts more strongly on the zinc than the saliva, and the more intense the chemical action the greater the amount of electricity generated.

Repeat the experiment, substituting a silver coin for the iron key, and you will find the electric current still stronger. This change will require a little explanation. It has already been said, and we have found it to be true by experiment, that saliva and salt and water act chemically on zinc, thereby setting up an electric current; but this is also the case in a minor degree with iron, consequently the key sets up an opposition current to the zinc, thereby partly neutralising the effect. Now, the saliva acts still less upon the silver coin than on the iron, so that there is little or no opposition current. If we use gold or platinum the effect is still further increased. The ordinary metals being acted upon in the following order:—Gold, imperceptibly; platinum, scarcely at all; silver, very slightly; copper, slightly; iron, somewhat strongly; zinc, very strongly; magnesium, very strongly indeed.

If we want to make the strongest galvanic pair out of the above metals we should choose gold and magnesium, but as both of these metals are extremely dear, we have to fall back on zinc for the generating plate, and platinum, silver, or copper for the collecting plate. There is one very cheap substance which, although not a metal, is superior even to gold and platinum as a receiving-plate, and that is the carbon which is found lining the insides of gas-retorts.

To sum up, in order to form a galvanic pair, we must have,—

1. A plate of metal which is easily acted on by water, saliva, brine, or dilute sulphuric acid.
2. A liquid to act on the plate chemically, and so produce an electric current.
3. A plate of carbon, platinum, or some metal that is not acted on by the liquid; and
4. A vessel to contain them.

The next step that Volta made was to join the zinc of one vessel with the copper of the next, as shown in fig. 2.

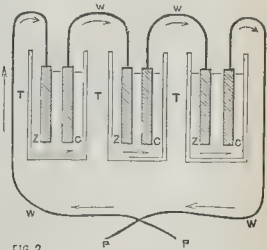


FIG 2

By arranging the vessels in a ring, he obtained a large increase of power. This arrangement he called *la couronne de tasses*, which was the natural development of his pile of zinc, copper, and cloth discs, a vessel of exciting fluid taking the place of the latter, with a series of sixty such

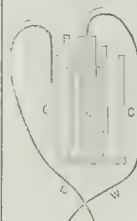


pairs. Volta found that, holding the end wires in his moistened hands, he experienced a slight shock similar to that produced by a frictional electric machine, and that by holding the ends of the wires very close to each other, he could get a slight spark. Carlisle and Nicholson, two English philosophers, found that the current was capable of decomposing water into its elementary gases, oxygen and hydrogen, the former uniting with the metal of which the wire is composed, the latter escaping in minute bubbles. When platinum terminals were used, both the gases were liberated, oxygen refusing to unite with that noble metal under ordinary circumstances.

The next advance was also made by an Englishman of the name of Cruickshank, who, instead of using separate vessels, used a wooden trough divided by partitions. But none of these philosophers took up the subject with the same enthusiasm as the great Davy, who had just then assumed the direction of the Royal Institution, then newly established. From the chemical effects of the galvanic battery Davy turned his attention to its heating power. He constructed a gigantic battery, consisting of 150 pairs of zinc and copper plates, 4 in. square, and another series of 50 pairs of zinc and silver plates of the same dimensions. He also provided himself with a third battery of 20 pairs of zinc and copper plates, 13 in. square. With the smaller batteries he produced most interesting results in the way of obtaining sparks of dazzling brilliancy between terminals of brass and other metals. Between charcoal ends it had all the vivid whiteness on a small scale of the arc lights with which we are all now so familiar. When passed through fine wires of steel, iron, platinum, and other conductors of electricity, it rendered them white hot, and even fused them; in other words, he produced our present incandescent lights with metal instead of charcoal. Having obtained such brilliant results with the battery at his command, Davy resolved to construct one on a still larger scale, the plates of which were 2,000 in number, and measured a total surface of 123,000 square inches, or nearly 900 square feet. With this powerful battery he found he could get an arc between the charcoal terminals of his gigantic battery of 4 in. in length, the temperature being enormous. Quartz, sapphires, magnesium, lime, and other refractory minerals melted before it, like wax. By examining the arc with dark red or green glasses, it was found to be formed of a stream of highly incandescent particles of solid, liquid, or gaseous carbon, or perhaps all three, which rush from one charcoal point to another as long as the current is kept up to its full strength. The same thing happens if the points are of metal; in fact, whenever the feeblest spark is taken from an electric machine by, let us say, a human knuckle, infinitesimal portions of the metal composing the brass knob, and of the skin of the finger, are detached and heated to incandescence by the electric current, the air contributing its quota by supplying oxygen for the other materials to burn in; in fact, all luminous electrical effects are due to incandescent matter, either stationary, as in the incandescent light, or movable, as in the arc light, in which the current carries a glowing stream of particles from one carbon to the other.

The next step in advance was an improvement in the form of the battery itself. Referring to fig. 1, it will at once occur to the most unscientific reader that all the electricity generated on the off-surface of the zinc plate is lost, there being no copper plate to collect it. At the suggestion of Dr. Wollaston, the copper plate was bent into the shape of a U, the zinc plate being suspended in the middle, a device that considerably increased the power of the battery. The great defect, however, of all batteries made up to the year 1836 was their lack of lasting power; that is to say, their first effects were of a most powerful character, but they gradually decreased, until they dwindled down to nothing at all. This gradual decay of strength was due to several causes. Every one knows nowadays that water is composed of two gases, oxygen and hydrogen, which are split asunder by an electric current. In the copper, zinc, and dilute sulphuric acid arrangement the sulphuric acid is left intact, but the water is split up into oxygen and hydrogen. The oxygen given off by the zinc plate is immediately absorbed by that oxygen-loving metal, and forms oxide of zinc, which is familiar to every one as Hub-buck's zinc white. This is at once laid hold of by the sulphuric acid and transformed into sul-

phate of zinc, or white vitrol, as it is generally called. The hydrogen given off by the copper having no liking at all for that metal refuses to unite with it as the oxygen did with the zinc. Some of the bubbles of hydrogen rise through the dilute sulphuric acid, while others stick to their birthplace, and cling to the copper surface with the greatest pertinacity, covering it over with a layer of tiny bubbles of hydrogen, which at last form an armour-plating that is effectually impenetrable to the electricity sent over by the zinc-plate. Several methods of getting rid of the layer of hydrogen bubbles were tried, such as blowing air through the liquid, but they all failed. Then, again, the liquid at last became saturated with sulphate of zinc, the whole of the sulphuric acid being used up, the only remedy being to recharge the whole of the cells. At last, somewhere about 1836, Professor Daniell, of King's College, London, conceived the idea of absorbing the hydrogen formed on the surface of the collecting-plate, and invented his justly-called "constant battery." A single cell of this battery consists of a cylindrical copper can (C, fig. 3), which forms the collecting-plate of the pair. In the middle of this stands a cylindrical pot of porous earthenware containing a zinc rod, Z. The porous pot contains dilute sulphuric acid, and the copper can a solution of sulphate of copper, or bluestone, as it is generally called. Now sulphate of copper is composed of sulphur, oxygen, and metallic copper in a state of chemical combination, and the liberated hydrogen, having a greater liking for the two first substances than the



copper, it onsets the metal from its place and enters into union with the oxygen and sulphur to form sulphuric acid. The copper, thus being free to go where it likes, deposits itself on the inside of the copper can, in thin layers, which, like the metal beneath, absorb the electricity produced by the zinc rod. The two liquids, inside and outside, although they come together, mix but very slowly, passing through the porous boundary as water passes through a wine-cooler, thus forming a conducting medium, through which the electricity generated by the zinc passes to the circular wall of the copper can.

A cell of this kind would soon wear itself out. The whole of the copper would deposit itself on the surface of the copper can, and we should have nothing left inside and outside but dilute sulphuric acid and sulphate of zinc, in fact, we should have an old-fashioned zinc, copper, and dilute sulphuric acid pair once more. The life of the battery is therefore prolonged by suspending a little bag or cage of bluestone crystals just inside the copper can. At last, however, the copper solution creeps through the porous wall and the metal becomes deposited on the zinc, putting a stop to all further electrical action.

Daniell's battery has received numerous improvements, especially for telegraphic purposes, but with these we have nothing to do. A French electrician, Dr. Reynier, has substituted a closely-fitting parchment paper bag, strengthened by an outer covering of cotton cloth. The copper vessel is flat and a zinc plate is substituted for a rod. With fifty cells of this battery Dr. Reynier has been able by means of one of Faure's accumulators to light his house by incandescent lamps. That is to say, by using the battery for, say, eighteen hours he has been able to light his private house for six or seven hours daily. There is but little doubt that some such arrangement as the above will have to be used for electrically lighting private houses in isolated situations, where steam power is objectionable or unavailable.

Numerous modifications of Daniell's battery have been used for domestic purposes, but the only one which need detain us is Leclanché's, which consists of a plate of carbon as collector in lieu of the copper can, surrounded by a cylinder of powdered black oxide of manganese and coke consolidated by hydraulic pressure, side by side with a zinc rod. In this case the cylinder forms the porous material, and the black oxide of manganese yields up oxygen to the hydrogen developed on the surface of the carbon plate, forming with it water, which, of course, mixes with a solution of common salt or sal-ammoniac which surrounds the whole. In this

case only one solution is used. The Leclanché cell is a most convenient one for domestic use, and is now nearly always employed for electric bells. It lasts for six months or more, according to the work it has to do, and is easily renewed by the most unscientific persons.

Other modifications of the Daniell battery, such as Grove's and Bunsen's, we have nothing to do with, seeing that as they emit fumes they are useless for domestic purposes.

So far the production of current electricity by chemical action; in our next we will endeavour to describe the way in which the same kind of electricity is produced by motion alone.

#### AMERICAN ART AT THE PARIS SALON.

It is, perhaps, unfortunate for the American artists that this year's *Salon* should be regarded by competent authorities as inferior to former exhibitions, because the American painters for the first time in their history are dignified in Paris by a recognition of their artistic powers, a recognition that reaches them much earlier than the most sanguine can have dreamed of. The historian Sismondi's slander, that America is a country deficient in certain honourable attributes, amongst which he included art, certainly no longer can attach to the Americans, and reflection shows us that their history is so intimately connected with that of Europe, so entirely a sequence of our past, that Sismondi's contemptuous accusation that the Americans are a people without a history is even further from the truth than the statement that they are without art; but it has not been until the present year that their painters have shown themselves with anything like prominence at the *Paris Salon*. American art has been represented, and honourably, at the Parisian exhibitions of late years, but it has never before so distinctly "stood out" in a manner not only evident to the indulgent and interested eyes of countrymen, kinsmen, and well-wishers, but to those even of critical foreigners. It would be unkind, perhaps, to throw out the suggestion that perhaps on inquiring closely for the reason of the prominence of the Americans, it would be found that skilful methods had been adopted, in connection with the means of becoming popular, not altogether the result of the exclusive study of the fine arts. Paris, as a teacher, is looked to by America more than ever; the *ateliers* of the French painters in vogue are crowded by young Americans to an extent that has led them to be somewhat irreverently, if suggestively, nicknamed by their foreign brother pupils in the *École des Beaux Arts* "trichines." Each year brings over its further contingent to swell a rapidly-growing colony, which has its branches in Munich, in Florence, and where not, wherever the best masters' *ateliers* are to be found. When we hear that the population of America, of the United States that is, before eight years are out will have increased by hard upon 20,000,000, and will equal the combined inhabitants of France and England; when we know the steps being taken by our cousins to foster their art education, the acknowledged success of the American painters in this year's *Salon* affords, it will be admitted, ample matter for thought.

America in the past has had more than one fine painter; in the best ages of art Italy would have been proud of Washington Allston, and Copley would have done honour to any country as he did honour both to America and to England; and since the days when those two great artists lived, there have been many American artists whose works have enriched the world. Storey, the sculptor, still lives, and is one of the most highly-respected artists in existence, and if it were not that we should have to enumerate names known alone to a few warm lovers, we could mention many American artists who deserve all the credit, if not all the honour, that is due to the pursuit of art. It seems, however, that the Americans desire in the first place a recognition of their merits from the Parisians; it is at Paris more even than in Italy or Germany that they seek the knowledge and the practice that lead to fame and fortune. London appears only to attract a few American minds who, in our narrower field, are contented with the substantial rewards for the sacrifice of the advantages of their nationality.

That the *Paris Salon* this year should contain over 100 pictures by American artists is not so remarkable as that a considerable number of places of honour should be occupied by their works; three or four of these have attracted,



and are still attracting considerable notice. It is not only from the American colony, but from the French world of art and the press, that Mr. Sargent's Spanish dancing-girl is commanding an amount of admiration that is most worthily deserved. The work, an inspiration during a recent visit to the Peninsula, possesses, indeed, very much the appearance of an exceedingly hasty, but not altogether ill-considered, work by Velasquez. That it has made a fame for the painter there can be no doubt, and this picture,—having as near another of his works, a portrait of a young lady in black, a picture which leaves very little room for severe criticism,—seems to have placed Sargent not only just now at the head of the American school, but to have placed him on equal ground with the most prominent French painters, a brilliant rival of his successful master, Carolus Duran, a position which, however, he will find extremely difficult to hold, when we consider his youth and comparative inexperience. Should Mr. Sargent, however, replace Mr. Healy, so long known to the American colony of Paris,—and who is literally conspicuous by his absence in this year's *Salon*,—the homes of America will have added to them during the next generation many a charming head that will be handed down to posterity. It is with some pleasure that we notice this young painter's success, as we may fairly claim to have been among the first, some years ago, to draw attention in these columns to the merit of M. Carolus Duran's clever pupil.

If Mr. Sargent's portrait has received almost the unanimous suffrage of a critical art public, Mr. Whistler's portrait of a lady in black fails to please the Parisians. Its merits, whatever they may be, place this American picture, in the estimation of not a few, in the light of an American caricature; it has, at least, the quality of caricature, in that it promotes mirth.

Bridgman, the American painter, who is not unknown in England as a delineator of Egyptian subjects, in the manner of his great master, M. Gérôme, has this year deserved his patient archaeological inquiries, and has painted a full-length figure of a handsome Roumanian blonde, dressed in the elaborate and brilliant costume of her country; coloured somewhat in the manner of the German painter, Richter. This picture occupies a place of honour in one of the chief rooms, and is as unlike the uneducated ideal of an American creation as it is possible to conceive. Bridgman's second picture, painted again in a different manner, reminds one of Decamps and Millet, but in the treatment of the subject, "Colza-Planting in Normandy," he is perfectly original and independent. The work fairly ranks, in our opinion, among the few fine landscapes of this year's *Salon*.

One is not prepared to meet in a French exhibition with so ambitious and thoroughly classical a subject as that of "Alexander at Persepolis," signed by an American; Mr. Hinckley's effort, displayed on a huge canvas in thoroughly foreign style, merits at least the recognition that should await any attempt to work outside the usual run of easel pictures. Hung over one of the doors, Mr. Hinckley's work fully asserts itself; the treatment is French, in the Contour style, though the same can scarcely be said of the colouring or of the unusual amount of energy and movement displayed in the figures. Mr. Hinckley is another promising pupil of M. Carolus Duran's atelier; but let him avoid trying to astonish the public.

Miss Elizabeth Gardner, so faithful a pupil of M. Bouguereau that it would really require the utmost skill to detect between the work of the master and the *élève*, has no more than justice done to her charming "Daphnis and Chloe" by its position on the line, where her delicately-painted figures form as curious a contrast to Mr. Sargent's "dash" as it would be possible to conceive. Mr. Ridgway Knight's pathetic picture of a sorrowing mother surrounded by sympathetic friends at the doorstep of an old French cottage, shows us the romantic side of the American artistic nature, combined with the realistic study which the modern ideas demand. Mr. Simons, in his amusing "Rendezvous de Chase," shows himself a faithful pupil of his master, Vibert; and should he continue to follow this style we may confidently predict him ample recognition in his native country, where Vibert's clever "skits" on monkish life and Spanish intrigues have always been favourites. Mr. L.B. Harrison's landscape of a "November" holds well its position on the line; the pretty grey tone of the picture, the red leaves and the

greenish stumps, with the young peasant girl in the foreground, are full of the romance which every one must have felt in the country when the leaves have all fallen from the trees, and before the snow has buried everything up in its folds of blinding monotony. Mr. Harrison's other exhibit,—a young girl dressed in white returning home through the fields from her confinement,—shows in its charming colour a careful study of nature. Mr. Boggs (a great New York family name), in his representation of the Place de la Bastille, with the Column of July, on a wet day, has evidently been inspired by a recent success of M. Luigi Loir, but his picture not undeservedly attracts attention in the honourable position it occupies.

As for Miss Dodson's ambitious Scriptural subject,—of colossal dimensions,—representing Moses, supported by Aaron and Hur, praying for the defeat of Amalek, it is to be hoped that the work is only a commission, though there is strong evidence of study. Miss Dodson will, we trust, attempt next year something more in unison with the spirit of our times.

Mr. Chase's portrait of Peter Cooper has deservedly received its position on the line, and in a centre, not alone on account of the honour that is due to the noble benefactor it represents, but on the score of its independent merit as a striking portrait; as a sitter, however, the worthy model was inspiring, reminding us not a little of the late lamented Sir Henry Cole. Mr. Chase's neighbour, Mr. Beckwith, had better beware of a too great swiftness in his portraits, a quality alone to be obtained at the price of long and hardy study. Mr. Curtiss's "Flirtation" is well painted, and the story well told, but thoroughly French,—a feature only too observable in all the American art at the *Salon*. Mr. Simmons must, we suppose, be excused if his "Study at Concarneau" reminds us of Breton. It was the home of that romantic painter of peasants and evening effects, and this picture was doubtless the result of a pilgrimage to a beloved shrine; but the merit of the work has justly given it a place on the line. Miss Singer's charming "Marie," who in her Breton cottage spins by the fire with her baby, which she lulls to sleep with a song, is just such a subject as the refined mind of a woman knows how to treat so well. Mr. Mosler, in his "Bethrothal," has contributed this year a picture of no less merit than that which not long since was purchased by the French Government to represent in the Luxembourg Gallery the modern American school.

Among the many other American works exhibited,—mention of all of which we must be excused from making,—it would be unjust to pass over the works of the American wood-engravers, as represented in the black-and-white room by Mr. Closson's frame of proof-impressions of prints, most of which have become familiar to the English public in the pages of the two illustrated American magazines now established among our periodicals. In the midst of many other excellent woodcuts, etchings, engravings, and lithographs, these delicate works essentially "tell out" to do honour to the American school of wood-engraving. But, returning to the pictures, it would be equally unjust to pass over the familiar name of Albert Bierstadt, represented in this year's *Salon* by a picture of American stages. Mr. Bierstadt represents the old-fashioned school, and though he has long been *hors concours*,—inadmissible, that is, to compete for the medal,—it would be rather in the tone of disrespect that his younger countrymen would be found speaking of him, if asked to give their opinion on the once-famous painter of the "Niagara Falls."

A comparatively new name to us among the American painters, A. T. Harrison, placed honourably in the *Salon*, is represented by a picture entitled "Châteaux en Espagne," and never do we remember having seen so favourite a subject so thoughtfully treated. The happy little sand-boy lying on the sea-shore, his blue eyes day-dreaming into space, the connexion of his thoughts with the sand-built castle at his side surmounted by a delicately-painted bird's feather, the danger of the propinquity of the great sea so soon to wash away the shell-defended castle, all are admirably rendered. The picture possesses not only the merit of suggestive thought, but of an agreeably free execution and colouring according to the latest methods of open-air study. Mr. Harrison's little sand-boy is not the only builder of *châteaux en Espagne*; the American painters are all just now building magnificent castles in the air, as their brother-

architects are building at home substantial palaces, veritable castles, that the occupants are employing the painters to decorate.

It may be safely said that the American painters have before them a good time; to them at least is the possession of the reality of youth, and the hope and the promise of years well occupied, and the happiness and profit that follow correctly-aimed effort. Americans, from nearly all quarters of their big country, are overcrowding the schools of art that exist in Paris, in Munich, in Florence, and elsewhere, and American painters are beginning the difficult and fascinating art with peculiar advantages,—advantages derived from the teaching of masters who themselves have learnt much by their own failures and by the experience of the failure of others,—men who, after years of labour in search of a high ideal, have reached a period when realistic art is the most honoured. American painters have the advantage of beginning to practise art at a period when his hopes are not confined to ideal comforts, but when something more than an assurance seems to exist that devotion to art does not bring with it the promise of hope alone, but those more easily-understood enjoyments that are at the command of the possessors of wealth.

#### WORKS BY M. J. J. TISSOT.

FOLLOWING an example which has been rather often set of late, M. Tissot has opened an exhibition of his own works in the Dudley Gallery. M. Tissot has a distinct claim to be regarded as an artist with a special stand-point. He has devoted himself mainly to the painting of the figures and manners of every-day people in every-day society; and he has chosen to take for his field of operations that section of society which has its head-quarters in London. In realising on canvas the manner and style of English people of a certain social type, dressy young women and young men, who represent the superficial polish of society, without any higher qualities, M. Tissot has succeeded in a way in which no other French painter that we can think of has succeeded. The want of comprehension of the English lady, both by French novelists and French artists, is almost proverbial; but M. Tissot shows us, as far as he goes, as we really are. The two young ladies, in faultless costumes, who lounge and flirt on the stern-gallery of "H.M.S. *Calcutta*," are absolutely photographs of the London *belle*, in summer array. The fashion of dress has changed since it was painted, but it is absolutely truthful to what was in fashion a few years ago. "The Thames," showing two or three figures on the deck (we regret to say) of a steam launch, is an equally truthful representation of a somewhat quieter and less fast set of personages. What we regret is that latterly the artist seems to have confined his attention to the most foolish and inane type of *belle*, the young lady who has no claim upon our interest but being well dressed and well mannered, and whose countenance expresses only good-natured ennui and absence of ideas. When M. Tissot first came among us he did better than this; he painted one or two large and elaborate "Society" pictures, which were exhibited at the Royal Academy, in which he showed the more refined elements of London Society, in their external appearance at least, with the greatest truthfulness. He has since then painted many figures which only represent, if one may use such a contradictory expression, a rather vulgar kind of refinement, and some of the etchings in this collection come under that category. Among the paintings, of which about a dozen are included in the present collection, there are, however, a set which show the application of art to the illustration of modern life in a rather more serious fashion; a group of four pictures illustrating "The Prodigal Son, in Modern Life." The treatment of the subject is not very elevated, but there is a great deal that is very clever in the four pictures. "The Departure" shows the interior of an old-fashioned bay-windowed room overlooking the river at Greenwich, the intending prodigal sitting on the table and undergoing the arguments of his grey-headed father, a prepossessing old gentleman, in whose face and manner there is a good deal of feeling expressed. The elder brother looks out of the window with an air of indifference, and a younger sister looks rather anxiously up from her work. The second picture, which is very unsatisfactory as a composition, shows the prodigal looking on at the performances of some



dancers whose nationality we cannot make out, and apparently with a frail female companion under his protection. The composition is confused, and does not tell any story very clearly. In the third the prodigal has landed barefooted and in rage from a cattle steamer, and embraces the grey-headed father on his knees: the sister behind puts up her gloved hands to each side of her face with a very natural action of consternation. In the last picture we have "the fattest calf" served up on a dinner-table under an arbour by the Thames, the prodigal sharpening the carving-knife, the sister smiling by him with her eyes brimful of mirth, and the mother on one side (a very nice elderly lady's face), while the father turns round to welcome a boatful of flannelled young men, one of whom is just landing, while the elder brother on the other side whispers an explanation behind his hand, "I say, Jack's turned up again, and the old governor's making no end of a fuss over him." The boat-load of men, who are seen below the bank, the spectator looking down upon them, are very well drawn and painted; the whole thing is very clever and worth looking at.

Besides his pictures and etchings, M. Tissot exhibits some specimens of work in bronze and *cloisonné* enamel, designed, modelled, and executed by his own hand. The principal specimen is a design representing Fortune seated upon the globe, which in turn is carried by a tortoise, the emblem of "Patience, the principle of all success." The group stands about 3 ft. high, and is an effective fancy as a whole, besides exhibiting some very good ornamental detail in parts; but we hope the artist will not carry out the idea of "adapting this work for a life-size monument or fountain": as a small design it may pass well enough, on a large scale it would be in danger of appearing very absurd. The exhibition also contains some tea-pots, vases, and other articles, decorated in *cloisonné* enamel by the artist's own hands. These are in very good taste, and there is considerable originality and effectiveness in M. Tissot's detail. He has had great difficulty in discovering the flux and tints for this work, which are kept a trade secret; but he seems to have succeeded in the end in producing very good results, and it is interesting to see the original work of an artist in this medium, instead of the mere panelling of Japanese work, which is what we usually see.

#### RECENT PROGRESS IN THE ELECTRIC LIGHTING OF BUILDINGS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of this Institute on Monday evening last, Mr. Horace Jones, President-elect, in the chair,

Mr. John Slater, B.A., Fellow, read an interesting paper on recent progress in the electric lighting of buildings. He commenced by observing that in the spring of 1879 a committee of the House of Commons investigated the subject of electric lighting, and examined a large number of witnesses. Although the time that had elapsed since that committee sat was so short, it was now extremely interesting and even amusing to refer to the evidence given at that time. Mr. Conrad W. Cook then expressed the opinion that in small and narrow streets, and in small shops, electric lighting could not be applied at all. The Borough Engineer of Liverpool said that it might be applied to street lighting, but not economically. Professor Tyndall did not think that an electric current generated by a dynamo-machine, and capable of producing one light of 10,000-candle-power, could be split up so as to produce ten lights of 1,000 candle-power each. These and other opinions expressed on the same occasion no doubt carried very great weight at the time, but, fortunately for the world, the opinions of scientific men, however eminent, did not damp the ardour of investigators, although they illustrated the danger of prophesying without knowledge. The Paris Electrical Exhibition of last year, and the one shortly to close at the Crystal Palace, contained many practical illustrations of the possibility of the almost indefinite subdivision of the electric light. At the present time there was an almost unanimous consensus of opinion amongst electricians that it is hopeless to expect that electricity could have full scope as a means of illumination until the legislative restrictions to its use for domestic purposes were removed. The cause of this revolution in opinion was to be found in the invention of incan-

descent lighting, which was undoubtedly the form which would be mostly used for domestic purposes. This incandescent lighting, of which the rush to the front had formed the chief feature of the past year's progress, might be defined to be the unlimited power of concentrating large quantities of heat into small foci without consuming the heated body, which thus became a stable and unchanging point of light, in contradistinction to the arc lights, in which the glowing material was continually disintegrating or burning away. The incandescent systems of electric lighting were based on the fact that, if preserved from combustion, carbon is practically infusible, and the chief difficulties in the way of making incandescent lamps lay in the fact that it was necessary to inclose in an exhausted glass globe an extremely thin filament of carbon, which must be in electrical contact with wires outside the globe, and which must be able to stand an enormously high temperature. Messrs. Swan, Lane-Fox, Edison, and Maxim, had overcome these difficulties in different ways. When a current of electricity was sent through any circuit, heat was generated, the amount of heat depending upon the resistance to the flow of the current offered by the substance forming the circuit, and the amount of light depending upon that resistance. The amount of light emitted, and therefore the quantity of light emitted, depended upon the nature of the material employed. By sending an electric current through platinum wire, the latter would immediately begin to glow with a dull red heat, and if platinum wire could be brought up to a very high pitch of incandescence, so as to become an effective means of lighting, it would form the simplest material for incandescent lighting. But, to secure sufficient illuminating power, it was found necessary to employ carbon in some form, and, in order to prevent the destruction of the incandescent carbon by combustion, which would be very rapid if the oxygen of the atmosphere came in contact with it, it was necessary that all the incandescent carbon lights should be secured in a vacuum, or at any rate in an atmosphere from which oxygen was excluded. One of the greatest advantages of the incandescent systems of lighting was that they could be used with either alternate or continuous currents, and in connexion with almost all dynamo-machines. They could also be conveniently connected with portable storage batteries, about the possibility of which there was only a whisper a year or so ago. The invention of storage batteries would mark an epoch in the history of electric lighting. Faraday's wonderful genius went far towards the elucidation of the problem. Having mentioned the *Planté* and *De Meritens* storage batteries, the author passed on to notice the *Faure* battery or accumulator, which consists of lead plates or strips thickly covered with red lead or minium, and folded up with felt between them, the whole being placed in a box of acidulated water. These batteries could be charged with electricity, and would give it out again gradually: hence their value as portable reservoirs of light. The *Faure* battery, however, possessed the drawback that the minium or red lead with which the lead plates were covered was very liable to be partially displaced during the transit of the battery from place to place. In the latest invented and patented storage battery, that of *Sellon & Volokmar* (twenty-eight cells of which were being used for lighting the Institute room on the present occasion), the coating of minium and the interposed layer of felt between the lead plates were dispensed with, the battery merely consisting of a series of lead plates in which perforations had been made, such perforations being filled up with a certain substance which formed the effective part of the plates. Every one admitted that the electric light was much less vitiating to the air of rooms, and where the incandescent system of lighting was adopted, not a single particle of oxygen could be absorbed by the lights. But could electric lighting be used as economically as gas? The answer to the question depended upon the mode of distribution adopted. As a matter of fact, a pound of coal turned into electricity through the medium of a steam-engine and dynamo-machine was capable of giving three times as much light as when turned into gas. The economic value of incandescent lighting was one of the most important points to be considered, and although at present the data upon which to found an opinion were but scanty, the cases in which the details of cost had been most accurately worked out tended

to show that the economic value of the new means of illumination had been, if anything, under-rated. The average life of an incandescent lamp, up to the present time, had not been more than 1,000 hours, but improvements in the manufacture tending in the direction of greater durability might be hoped for. Sir William Thomson, who had had his house completely lighted by electricity, stated that lighting by electricity was no more expensive than lighting by gas,—leaving out of account, of course, the first cost of the lamps, which would, there was little doubt, be improved and cheapened by competition. Messrs. Furlong & Sons, of Cork, who had used electric lighting in their factory, stated that it showed an economy of 50 per cent. as compared with gas. A very interesting installation of electric lighting had been made at Godalming, the Swan incandescent lamps being used for the lighting of shops and houses, and the Siemens arc lamps for the streets. The tradesmen who had used the electric light in their shops stated that although they were charged a little more for the electric light than for gas, the extra cost was far more than compensated for by the total absence of injury to their goods. The readiness with which the incandescent lights lent themselves to any scheme of decoration was one of their chief attractions. There was no necessity for following on the lines of gas-fittings, as the conditions were so completely altered; but points of light could be placed wherever they were required, and there was no fear of blackening ceilings and decorations, or of setting fire to the most easily-ignited materials. The progress of this system of lighting had been so rapid that architects had as yet had no time to turn their attention to its decorative capabilities; but when they did so, they would find it fulfil every requirement for perfect lighting. Having noticed some of the exhibits in the Paris and Crystal Palace Exhibitions, the lecturer alluded to the arc-light systems, in which, he said, much less progress had been made during the past year than in other departments of the electric lighting problem. Nevertheless, the sphere of usefulness of these systems had become more clearly defined, and at the Mansion House was to be seen a good example of their adaptation to rooms of an exceptionally large size. If these large lights could be concealed, and their rays reflected downwards from a large screen or a white ceiling, a very pleasant and diffused light would be obtained, and the slight irregularities, due for the most part to the carbons, would be much less perceptible. Simplicity of construction was the great thing to be aimed at in these lamps, and the Weston arc lamp was a good example of their newest form, and this might be termed a strictly electrical lamp, as contrasted with a mechanical one. The great difficulty with which these arc lamps had to contend was in the nature of the carbons, in the manufacture of which but little improvement had taken place. Probably the manufacturers had had so much work thrown on their hands by the rapid development of the already large industry of electric lighting that they had had no opportunities of making careful experiments with the view of securing homogeneity in the carbons,—a quality which was necessary in the highest degree in order to secure steadiness of light. The lecturer next passed in review the social aspects of the question of electric lighting. These concerned the distribution and measurement of the electricity, the conditions necessary for reconciling the rights of the consumer and of the purveyor, and the risks to be guarded against. Several systems of measuring electricity had been devised, notably that invented by Mr. Edison, but in the author's opinion it would probably be found more convenient, when the electric light was largely adopted, to dispense with measuring it, and to make a fixed charge per annum, based on the size and requirements of each house, for the electricity supplied, somewhat in the same way as the water companies charged for water. With regard to legislation on the subject of electric lighting, he thought the Bill brought in by the Board of Trade, and which was now before Parliament, would be productive of good results. Fears had been expressed lest the various electric lighting companies should ever develop into such gigantic monopolies as the gas companies. He did not think there was any ground for alarm. The conditions of distribution of gas and electricity were different; for, whereas the gas companies were able to extend their mains, mile after mile, to almost any distance, an area of one square mile would pro-



ably be found to be the limit of profitable distribution from each centre or installation. For electricity to compete with gas as a general means of illumination, it must offer as many facilities as its rival; and the Edison installation in Holborn, and that of the Swan lamps at the Savoy Theatre, showed practically that this condition was complied with. After briefly describing these installations, the lecturer observed that other and more extensive installations of the electric light would presently be seen, including that at the new Royal Courts of Justice, where, he believed, Swan lamps were to be used, the electrical arrangements being in the hands of Messrs. Crompton. He then proceeded to explain the various methods of laying the mains, connecting the branches, and arranging the lamps so that all were perfectly independent of each other, and showed how the strength of the current in the mains could be regulated in proportion to the amount of work it had to do. Perfect insulation throughout was the great desideratum, and if this point were always carefully kept in view, the dangers of electric lighting would be reduced to a minimum. "Insulate! Insulate! Insulate!" should be the motto of all who employed electric lighting. On the subject of wires conveying the currents for electric illumination, Mr. Slater expressed the strongest opinion that overhead wires should not be allowed, for they were not only dangerous, but unsightly. A great deal had been made of the dangers attaching to the use of electricity as a mode of lighting, and these cries of alarm were no doubt largely attributable to the gas interest; but he should like to see Gas, as plaintiff, come into court against Electricity, the defendant, with clean hands. If all the accidents that had occurred from the careless use of gas (from the blowing out of a house-front to the Tottenham Court-road disaster of two or three years ago) were to be recorded, what a formidable indictment could be made out against Gas! In America, considerable attention had been given to the precautions to be taken in the use of the electric light in buildings, and the Board of Fire Underwriters of New York had framed a code of regulations bearing on the subject. The Crystal Palace Exhibition was an exceptional case, as the installations were temporary, and the risks there were such as could not possibly occur in a well-devised permanent arrangement. Mr. Slater then referred to the importance of the subject to architects, and concluded his paper thus:—The progress of electrical science is the most striking feature of the latter part of the nineteenth century, and the day is not far distant when we shall find a certain acquaintance with the subject a necessity for us architects in our every-day work, unless we wish to be entirely in the hands of the men whom we employ. I would respectfully suggest to the Council the desirability of requiring a certain amount of knowledge of physical science from the candidates in the Obligatory Examination that has recently been set on foot, and the results of which are already so promising. Science has captured the lighting, it is true, but it is sorely tamed yet; let us beware that we do not attempt to deal with this new servant ignorantly. Electricity is a new power given into our hands, and it behoves us to study its advantages, and to guard against its dangers, and to learn to use it, together with the older means at our disposal, in accordance with the motto of the Institute, "Usi civium, decori urbium."

In the discussion which ensued, Mr. Swan said he had rarely, if ever, had the opportunity of listening to a more lucid exposition of the subject of electric lighting than that which they had all had the pleasure of hearing from Mr. Slater. He could fully confirm the statement made by the lecturer as to the essential economy of electric lighting, and more especially so with regard to electric lighting by incandescence,—the system of lighting which, he thought, had the widest application, and therefore possessed the greatest interest for the public. Gas was the light with which electricity would have to compete. Now 2 cwt. of coal carbonised in a gas-retort would produce 1,000 cubic feet of gas, and that would give about 3,000 candle-light power for one hour if burnt under ordinary conditions, i.e., by burners consuming about 5 ft. of gas per hour, and giving a light of about sixteen candles. If, however, the same quantity of coal were employed to generate motive power through the medium of an economical and effective steam-engine, 100-horse power for one hour

would be obtained, and by means of a good dynamo, each horse-power could be converted into electric light of at least 200-candle power, so that the 100-horse power obtained from the coal would be capable of producing 20,000-candle power through the medium of the electric light as against 3,000-candle power obtained by the gas resulting from the carbonisation of the coal; and even allowing a handsome margin for the loss of the residual products of gas manufacture, the gain was very largely in favour of the electric light. But such economy as he was speaking of could only be obtained under the best conditions as to installation, well-ordered generating stations, and proper means of distribution, and the obtaining of such conditions would, he trusted, be greatly facilitated by the legislation now pending. In order to properly test the capabilities of the electric light on a commercial scale, it was of the utmost importance that due facilities and securities should be given for the investment of capital in the creation of large electric lighting stations. He was very glad indeed to find that architects were taking an active interest in the question, for they would naturally have to be intimately concerned in carrying out the impending and very desirable change in our method of domestic illumination. Speaking as an electrician, he was quite content to leave the decorative arrangement and disposition of the lights to architects, for electricians had their hands sufficiently full in dealing with the physical aspects of the subject.

Mr. Lane-Fox said that reference had been made to the supposed dangers of electric lighting, but with ordinary care and intelligence such dangers did not exist, however much the self-interest of people interested in gas-shares might lead them, perhaps unconsciously, to conjure them up. It was true that some few unpleasant results had occurred,—that one or two people had unfortunately been killed, and that some fires had occurred; but those disasters had been the result of carelessness or ignorance. Had not disasters resulted from the use of gas, especially at first, from explosions due to leakages in the pipes,—a defect somewhat corresponding to imperfect insulation of electric wires? He believed that in the early days of gas-lighting the companies lost through leakage 50 per cent. of the gas manufactured; after a time they reduced it to 30 per cent., and now, he believed, the loss by leakage was not more than 3 per cent. When gas was introduced there had been no previous experience in making the joints of the pipes gas-tight; but in the case of electric lighting, much previous experience in the insulation of wires had been obtained, owing to the practices of telegraphy. It was a mistake to suppose that an electric current of such high tension as to kill a man who should make his own body a part of the circuit was a current such as would be ordinarily employed in electric lighting, for the lower the tension of the current, the more easily would the wires be insulated, and the more easily could the current be divided. Of course, in a large and new industry such as the progress of electric lighting had given rise to, there were many people thrown into it at first who had had little experience, and, occasionally, the consequence of this might be seen in defective and improper workmanship, but these matters would speedily right themselves.

The Chairman, in inviting further discussion, said that he should not be inclined to give a verdict to Mr. Swan on the score of economy without hearing the gas companies on the other side. From inquiries which he had made, he had learned that there was economy in using the electric light if the area to be lighted was large, and that the arc-light systems were, broadly speaking, four times as economical, lighting power for lighting power, as the incandescent systems. We were told of the futility of attempting to gild refined gold, to paint the lily, or to perfume the violet, but Mr. Slater had certainly illumined the subject of electric lighting.

Mr. A. W. Blomfield, in proposing a vote of thanks to Mr. Slater, said he thought the hint thrown out in the paper, as to the necessity of young architects giving some attention to physical science, was of very great value. If, as there could be little doubt, electricity was to be the light of the future, architects would certainly find it necessary to make themselves acquainted with the laws which governed its use for such purposes.

Mr. C. F. Hayward, in seconding the motion, spoke of the Godalming installation of electric

lighting, which, on the whole, had been a great success, although there had been a breakdown owing to the erratic conduct of the river Wey. Messrs. Siemens being called in, they superseded the water-power by a steam-engine, since which time the light had been uninterruptedly good. Had there been in existence at the time the change was effected such an appliance as either of the storage batteries which had been referred to, there would have been no need of making the change. As a resident in the neighbourhood of Godalming, he had had ample opportunity of witnessing the success of the experiment, and should have no hesitation in lighting his own house by electricity if he could induce the authorities to extend the wires so far.

The motion having been carried, Mr. Slater briefly replied, and a vote of thanks was given to Messrs. Selton & Volckmar for the use of the storage batteries and for the assistance which they had rendered Mr. Slater in fixing the wires so as to enable the dome and ceiling of the Institute meeting-room to be very effectively and steadily illuminated by incandescent lamps.

The room was probably never so crowded as it was on this occasion.

#### A CAUTION TO CONTRACTORS.

REPUTATION BY A CORPORATION OF A CONTRACT NOT UNDER SEAL.

WHEN the case of Hunt v. The Wimbledon Local Board (Law Reports 4, Common Pleas Division, p. 48; and Roscoe's Digest of Building Cases, p. 31) was decided, in which a contractor failed to obtain payment of his account because the contract between himself and the Board was not under seal, we expressed a hope that contractors would be warned by it against omitting the proper technical details in making contracts with corporations or local authorities. In the note to the case in Roscoe's "Digest," the necessity for caution which the decision renders necessary in dealing with public bodies is also pointed out. It cannot be said, therefore, that builders and contractors have not had fair warning to be careful how they deal with corporations. We regret to say that another instance of the necessity of this care is to be found in the recently-decided case of Young & Co. v. The Mayor and Corporation of Leamington (61 Law Journal Reports, Q.B.D. (App.), p. 292). We regret it because a firm which has done work for which it expected to be paid has been kept out of its money by the employers taking advantage of a slip in regard to a legal technicality. It is true that the Court of Appeal has held that the Corporation of Leamington was acting on its strict legal rights, but that does not make the nonpayment of Messrs. Young & Co. any the less a reprehensible transaction. For if work has been done, and the person for whom it was executed has got the benefit of it, and then refuses to pay for it, this is an act of which every member of a corporation should be ashamed, and of which each member as a private individual would, we are sure, not be guilty, even if he could. These expressions are, our readers will see, fully justified by the report of this case which now lies before us, and which we desire to call attention to, so that, if possible, it may be the last of these scandalous defences.

In November, 1876, one Powis, by contract under seal, agreed with the Corporation of Leamington, who were the Urban Sanitary Authority under the Public Health Act, 1875, to execute certain works for supplying the town of Leamington with water. In 1878 a person named Jerram was appointed surveyor to the Corporation under its official seal. The new surveyor found that Powis was not proceeding satisfactorily with the work, and ultimately Jerram took the work out of his hands, and was ordered by the Corporation to get the work completed in the best possible manner. On the invitation of the surveyor, Young & Co. tendered for the completion of the work, and agreed to carry it out and complete all the necessary works. As a matter of fact, Young & Co.'s tender was never actually placed officially before the Corporation, but a memorandum of the agreement was signed by Young & Co. and Jerram. The work was then continued and was duly executed, the Corporation from time to time making payments to the contractors on Jerram's certificates. "It was found as a fact (in the special case)," we quote from the regular report, "that the additional works executed by the plaintiffs were necessary and incidental to the completion of the works left unfinished by



Powis, and also that the employment of the plaintiffs to execute the works was within the duties and authorities of Jerram as the engineer of the Corporation. The Corporation took possession and obtained the benefit of the works executed by the plaintiffs, but refused to pay a balance of 6,000*l.* odd, on the ground that the employment of the plaintiffs was not an employment under the common seal of the Corporation. Now, so far as regards the law of the case, it is extraordinary that Young & Co. could ever have hoped to overcome this defence. Section 174 of the Public Health Act distinctly states that "every contract made by an urban authority whereby the value or amount exceeds 50*l.* shall be in writing and sealed with the common seal of such authority." Such points as that the original contract with Powis being under seal, no seal was therefore necessary to that between Young & Co. and the Corporation; that Jerram being appointed under seal, therefore it was not necessary that this one should be,—were obviously but the straw at which drowning men catch. The statute is clear enough, and as the Corporation was acting, so to speak, as trustees for the public, it was equally clear it could not be made liable on the ground that it had received a benefit from the work in question. If there had been any legal ground upon which the case might have been decided in favour of the contractors, it is clear enough that the judges would have used it, for, said Lord Justice Brett, in beginning his short judgment, "I have come to the same conclusion [as the other two judges] after many attempts to come to another"; and Lord Justice Lindley also pointed out that, when the Legislature had passed an Act the judicial bench was bound to construe it according to its legal meaning, even though it might lead to hardships. Therefore it may fairly be said that the case should be carefully borne in mind by all contractors; for we fear that there may be some other bodies in England as mean as the Corporation of Leamington. It is perfectly obvious that, had the Corporation desired to be just, they would, if they had considered the claim was too great, have referred it to arbitration. But not only should the case be borne in mind for this warning which it conveyed, but also because of an important sentence in the judgment of Lord Justice Brett, which we will give in its entirety,—"Further, having read all the cases with regard to the doctrine of work done for and accepted by a municipal corporation, I am bound to say that I have come to the conclusion that even if this corporation were a municipal corporation, and not a board of health, the want of seal would have prevented the plaintiffs recovering in the present case." Lord Justice Lindley does not go so far; he merely states that the cases are numerous and conflicting. But for laymen, we imagine, it will be sufficient to have Lord Justice Brett's clearly-expressed opinion, and therefore the short and plain rule is, always to have a contract with a corporation sealed with the official seal. The presumption is that otherwise a corporation will, even if it does not wholly repudiate its liabilities, yet use the absence of the seal to get off as cheaply as it can. Again, too, we hope that this case will be a warning to borough surveyors and engineers. They ought to be perfectly aware of the necessity for a corporation-contract being sealed, and should never allow any contractor, however ignorant he may be of legal matters, to enter into a contract without it is sealed. They may perhaps say that they do not undertake to look after the interests of the contractor; nevertheless it is perfectly clear, knowing the risks which a contractor who does work for a corporation runs if his contract is not sealed, that they should, as honourable men, take care that the contract is made a binding one. We have more than once pointed out that architects are by no means strict enough in giving written orders for extras; we are afraid that surveyors and engineers to corporations are also not sufficiently careful in seeing that the corporation seal is affixed to contracts with the corporations of which they may be the servants. The necessity of caution in this matter is so great that we consider the several associations of master builders would do well to circulate a memorandum among their members pointing out the short and brief rule of law upon this subject.

**Social**.—Mr. Horace Jones, as President of the Royal Institute of British Architects, has issued invitations to a dinner at "Limmer's" on the 5th of June, "to meet the Council."

#### HOUSE RENT IN PARIS AND IN LONDON, AND PROPORTION OF SOULS PER HOUSE AND PER FAMILY.

A WELL-KNOWN French publicist has lately published, in a French industrial journal, some details of the rental of Paris (of which we gave an abstract at the time), which contrast rather forcibly with the experience of London. M. Paul Leroy de Beaulieu is, indeed, of opinion that the homes of the poor are being banished from Paris. The value of land in that city, he considers, is becoming so enormous, that the owners are unwilling to allow the erection of any but the more expensive kinds of houses, so that there is an increasing want of accommodation for the poorer classes. These things, however are comparative. M. de Beaulieu's view may be accurate for France; but we should be glad to have no more serious difficulties to contend with in London. Land in Paris, he tells us, rises to the price of from 50 to 60 francs, and even to that of from 80 to 100 francs, per square metre. Land in London has been sold for equal prices per square foot. Sixty-eight per cent. of the tenancies in Paris are let at a rental not exceeding 12*l.* per annum. The total number of separate tenancies is stated at 634,932. The population is over two millions; but as the returns have been unaltered, so far as they are published in the only authorities we have at hand, for some years past, we cannot speak with the precision we should wish as to this. Roundly, however, the proportion is a little under three souls per tenancy. In London, in 1881, 3,814,571 persons occupied 486,286 houses, being at the rate of 7.84 persons per house. Over the "Greater London" of the Registrar-General (the above being what is called the "Inner London" of that officer's return) the number of houses is 645,818; the population, 4,764,312; and the proportion, 7.37 souls per house. But in some districts, as for example in St. Pancras, the proportion rises to nearly 10 persons per house. In the City it is 7.75 per house. The lodger element in London raises the proportion, while the French habit of distinguishing the *appartements* as separate tenancies prevents any very exact comparison. Still, if we allow the same proportion of occupancy to habitation all round, we find that two-thirds of the population of Paris are lodged for something like 2*l.* per head per week, and we apprehend that the corresponding figures, if attainable for London, would show a much more costly rate of housing.

As far as the figures cited go, the relation between the numbers and the rents of the tenures seems to be regular and intelligible. Converted into English money, they are as follows:—

Tenancies in Paris.	Number.	Percentage.
Under 12 <i>l.</i> per annum...	468,641	68
Thence to 20 <i>l.</i> "	74,860	10.8
" 20 <i>l.</i> "	61,083	8.8
" 30 <i>l.</i> "	21,147	3.1
" 50 <i>l.</i> "	17,202	2.5
" 60 <i>l.</i> "	6,198	0.9
" 120 <i>l.</i> "	21,433	3.2
" 240 <i>l.</i> "	9,085	1.4
" 400 <i>l.</i> "	3,049	0.4
" 800 <i>l.</i> "	1,453	0.2
Above 800 <i>l.</i> "	421	0.06

The most curious anomaly in the above figures is the small proportion of the tenancies ranging from 50*l.* to 60*l.*,—a kind of house for which there would be more than ordinary demand in England; and the unduly large proportion of those ranging from 60*l.* to 120*l.*. No doubt an analysis of the social habits of the Parisians would be able to throw light on this curious irregularity (supposing the figures to be correct) in the ascending series. The small number of tenancies (little more than 2*l.* per cent. of the total), above 400*l.* per annum, must contrast very forcibly with London rents.

The proportion of inhabitants to houses is a measure of national prosperity which it is important to regard aright. In comparing one country with another it is necessary to bear in mind the differences of national habit, as in the case of the use of separate apartments in one large house, or of smaller independent houses. In the same country, at different periods of time, this element of disturbance is less apparent. In England and Wales, in 1801 there were 564 inhabitants to 100 houses. In 1841 the proportion had fallen to 540. In 1881 it was 537. In Ireland, in 1841 there were 617 inhabitants to every 100 houses. In 1881 there were only 565. The larger numbers in the latter Ireland signify more than they would

appear to do at the first glance, as the houses, taken all round, are of a very far inferior description. It should be noted also that the number of families returned in Ireland in 1881 was 994,573, giving an average of 519 souls to a hundred families. The difference of forty-six souls per hundred families as compared with the number of inhabited houses is serious, being nearly nine per cent. If this difference represents the number of lodgers, it is a remarkable state of things, but it is not evident what else it can represent.

#### THE PROPOSED INTERIOR DECORATION OF MILAN CATHEDRAL.\*

In the course of last November I received an invitation to visit Milan, and to give an opinion on the decoration of the cathedral. I must say that I was surprised, on the one hand, at the invitation, and, on the other, at the fact that the decorative restoration of the cathedral was to be taken in hand. The committee appointed to deliberate consisted of the following members:—Clandio Bernasconi, architect and professor at the Academy; Cesare Cantù, historian; Forcellini, architect and city engineer of Venice; Gerolamo Indano, painter; and myself. I must notice here something, perhaps, unknown to you, but highly interesting, and probably unique in the history of architecture. This is the fact that the *Amministrazione del Domo* has existed from the year 1302, when it was instituted as an independent body, up to the present day. All gifts had to be handed over to this body, which had to decide also in all other matters connected with the building. It selected, appointed, and dismissed all architects, concluded contracts, and it does so still. The most interesting part is, that the minutes of proceedings of this administration exist in an uninterrupted series, and it may be learned from them how far German art influenced the constructive form of Milan Cathedral. It has been affirmed formerly, with great emphasis, that the cathedral was built by German masters. This is not correct. It is, in its present form, nothing else but a good Lombard church, with all its constructive advantages and defects. Its forms remind us more of German, sometimes of French, but never of Italian architecture; but the truth seems to be that the men who drew up the plans were Lombards, while, perhaps, Germans or Frenchmen were called in to assist in carrying out the details.

As long as the construction of the colossal outer walls was quietly proceeded with, little notice was taken of the question how the vaults were to be formed; for those Lombard architects relied much on their mode of keying and fastening with grappling iron. Later, however, some anxiety may have been felt on account of static proportions, and German architects were called in and consulted at various times, and even officially appointed. They were of opinion that the building could not be completed as it had been begun; that some parts would have to be walled up, in order to complete the vaulting according to static laws. The Milanese did not take the same view, and the result was that their cathedral was finished in accordance with the original plans, such as we generally find in Lombard churches. The last time German architects assisted was when Master Ferrauch built the cupola. In 1858 I was desired by the late Emperor Maximilian to draw up plans for an isolated clock-tower for the cathedral. I complied with the wish, and submitted two designs. Political events intervened, and I believed my drawings lost, until I found out the contrary during my recent stay in Milan. To my great joy, my drawings had been well taken care of in the archives.

A colossal building like Milan Cathedral experiences in a marked degree the least movement made by the earth's surface, as well as the influence of temperature, so that it appears improbable that the roof, consisting of marble slabs, could be kept waterproof. Notwithstanding the most careful execution and preservation, the joints of the pavement will open imperceptibly, water entering the small fissures and finding a way down. It is a fact that in the course of time perfect ditches have formed in the spandrels over the vaults; the vaulting has become damp, and pieces of plaster have dropped in various places. Now, the vaults

\* Abstract of a lecture delivered by Ober-Baurath Frd. Schmidt before the Austrian Society of Engineers and Architects, Vienna.



are, as is well known, painted in a peculiar manner, that is to say, with panels of open-work tracery, which, indeed, are excellently executed, but cannot be brought in harmony with our static views of the function of a vault. Although this has perhaps been recognised at Milan, no one thought of undertaking a change in this direction, until large patches of plaster began to detach themselves, and thus brought the question into the foreground, with the choice of either effecting renewals on the old system and mending the existing frescoes, or of breaking with it and adopting a new system of decoration.

The Amministrazione del Domo decided, quite correctly, for the latter alternative, and a limited competition was opened, four Milan artists being invited to submit their designs for this decoration. As soon as these designs had been found generally acceptable, they were severally commissioned to execute a pattern on an esquisse of the vaulting. These executions were highly interesting, displaying entirely different conceptions. One of the artists—the cathedral architect—introduced the old system of a blue ground, gold stars, coloured margins, &c. His treatment showed great taste, but was not austere enough for Milan Cathedral. A second proceeded from the principle that only gold ought to be applied in contrast to the natural colour of the marble of which the fabric of the cathedral consists, and that everything required in the form of colour to enliven the space is conveyed to it in abundance by the painted windows. The two remaining competitors adopted a similar principle in their treatment, but they employed entirely different means of decoration. One made the vaults appear as if constructed of pieces of marble, adding rich ornamental leaf-work along the ribs, the same style of decoration being also used for the keystones. The fourth artist followed a similar system; but he painted those ornaments in gold and colour. The ground was a plain chamois tone. These were the four systems on which we had to decide. As regards myself, I was in favour of the design of the second artist, which I considered the only true solution, and by which the architectonic lines of the arch are traced with gold; this view I advocated before the committee. The result was that these principles were adopted as fundamental for the decoration of the cathedral, the only difference of opinion existing between us being that, while I urged that the artist who had come nearest to the true solution of the problem should be charged with the execution of the work, the other members of the committee thought that the one who had obtained almost the same effect should likewise be asked to submit a second design. We also arrived at the conclusion that it would be advisable to break the great monotony of the vaulting of the nave by figure subjects. As far as I know, work is being proceeded with on this basis, and I have no doubt but that it will be carried out in a rational manner.

#### A FRENCH CRITIC ON ART-EDUCATION IN AMERICA.

M. REGAMEY, a well-known Parisian painter, on his return from a recent official visit to America, where he had been sent by the French Government to report on the American system of art-education, has published an exhaustive work on the subject of his mission, "L'enseignement des arts aux Etats-Unis." That the French Government should thus send across the Atlantic an artist specially to inquire into the methods of art-education, or, rather, of the teaching of drawing in existence in the United States, might at first sight seem somewhat strange, were it not that within recent years the subject has received in America, from competent authorities, an attention which gives to their methods and adopted systems a value worthy of the highest consideration. With the energy and enthusiasm which our kinsmen display in so many directions, the question of the value, commercial as well as æsthetic, of art-education has been grasped, and, as a first step, the legislature moved to pronounce in favour of a wide extension, throughout the educational system, of the teaching of drawing. It was at the Philadelphia Centennial Exhibition that the first results of the movement were placed before the public in such a manner that an opinion might be formed of the success of

the methods adopted. These results were encouraging to the highest degree, and the foreign reports on the exhibition flatteringly referred to the energy displayed in the American art-schools. In this success it is gratifying to find that England may take upon herself some portion of the credit due to America. It was largely upon the methods in vogue in this country that the Americans went to work to organise their system of art-education, and it was in great part under a prominent professor in our Science and Art Department at South Kensington,—Mr. Walter Smith,—that the system was placed. When, some years since, the movement was set on foot, it was soon recognised that the elements necessary for its guidance were utterly wanting in the country; but, as usual in similar cases, our kinsmen looked across the Atlantic in search of the most able available assistance. In Professor Walter Smith was secured an enthusiast whose name has long been associated with the question of the desirability of a wider spread of art-teaching among all sections of society.\*

Once commenced, the movement spread with the rapidity to which, in connexion with things American, we are at length commencing to cease to express our astonishment. It was not alone in Boston and New York, already largely provided with the means of art-instruction, that the interest manifested itself; it crossed from town to town the whole continent, and Chicago, Cincinnati, and San Francisco have all sided warmly to help on the cause. Schools of art, institutes, libraries, and museums have sprung up in every direction, all largely attended and fostered. The interest and progress in art in America, in fact, aided as it is there by the wide spread of culture and the absence of the all-absorbing centralising influences so powerful in the countries of Europe, is only one more of the proofs of the energy and wisdom displayed in so many circumstances by our kinsmen beyond the sea.

The systems of art-education adopted in America having, at the Philadelphia Exhibition of 1876, attracted the attention of the French Government,† it was, doubtless, in accordance with the recommendations of the Commission that M. Regamey was despatched, in 1879, to the United States, to prepare his report on the subject of art-education in America. This task the author has accomplished, with no small amount of skill. An artist and a traveller, who, indeed, owed his first recognition by the French art-public to his startling sketches of Japanese life and character, M. Regamey was ably fitted for his mission. He traversed a considerable portion of the American continent from New York to New Orleans, delighting numerous audiences in the cities through which he passed by a series of lectures of a novel nature, and for which he had gained in Paris no small reputation. His book is not confined alone to the subject of its title, but, as may well be imagined from a French writer, offers many amusing and instructive digressions on the various features which could not fail to strike an observant traveller in a country like America, which, in its busy, practical life and commercial activity, must have offered to him such a striking contrast with the old kingdom of Japan. But in these digressions M. Regamey does not neglect the subject of his mission, which his work amply fulfils. The style is facile, the tone frank and agreeable, with nothing teachy or pedagogic about it.

The purely practical value attached to the question of art-education, in its bearings on the artistic productions of the nation, is one of the features which we see most forcibly attracted the attention of the author. It has long been the pride of Americans to look forward to the time when they will cease to be in the smallest degree dependent on the Old World. In the United States it is felt that there is no need of anything or anybody; the country produces everything, corn, cotton, sugar, wine even, cattle, coal, iron, wood, gold, and silver; the soil is scarcely as yet touched. There is only

\* As far back as 1860 Mr. Walter Smith published a lecture delivered by him at the Mechanics' Institute, Regency, on "The Importance of a Knowledge of Drawing to Working Men"; since then he has published several invaluable reports on the systems of art-education in vogue in France, as compared with our own; while his works on industrial drawing and art-education justly hold a high position both in America and in this country.

† The portion of the French Report relating to this subject has been reproduced and published by Professor Walter Smith, in a separate form, "Industrial Drawing; the Questions of the French Education Commission," &c. Boston, 1879.

one want, a want of hands, which emigration is daily supplying. To education, in its widest sense, is left the rest, and on its influence the future reposes complacently. This spirit of independence, largely fostered throughout the States, has of late developed itself in the direction of art-production. It is not long since that in these columns the expression of this feeling was referred to, when the report of the New York Metropolitan Museum warmly urged that "the time has certainly arrived when America should cease to be dependent upon foreign production of beautiful work in any and every department of industry, when American youths should have the facilities for learning how to produce beauty which German, French, and especially English, youths have in technical schools. . . . If American industrial art is to rank with that of European countries, it can only be by having educated artisans." Educated artisans is the aim of the American methods of art-education to produce; they will endeavour, it is evident, to steer clear of the rock on which so much of the art-education of England and the rest of Europe has so far been, and is still being, wrecked, the production of a mass of ill-formed, ill-educated, disappointed "artists," in the sense of the word, such as it is generally understood; dreary "flashes-in-the-pan," who serve to swell the ranks of the ever-increasing army of useless factors in our national prosperity and advance. It is with a view to forming practical art-workers that the spread of art-education has so far been encouraged by the legislature in the United States, and it is purely in this practical light that the question has been considered. It is found that an enormous sum is yearly expended in the purchase of luxuries and products of art of European origin; the Americans now wish to possess their own art-workers, and encourage a consumption of home products. This utilitarian view of the question need have nothing surprising in it. There exists in America a strong undercurrent of healthy æsthetic and literary culture amply sufficient to counteract what might appear to be the too practical nature of the art-education so far afforded. There will always be the class of earnest art-workers to whom Europe will hold out its charms, and with whom the traditions of the Old World will always be sacred; but the expressed general sentiment possesses at present a strongly-marked practical character. It is not so long since, at the opening of the new house of the Metropolitan Museum at New York, that Mr. Choate, in referring to the six millions sterling yearly sent to Europe from America for art-products, asked why the country should be obliged to continue to pay this tribute, when, by the education of native workmen, it might be avoided.

Efforts have been to some extent made in this direction, efforts in which are plain the extraordinary results attendant on that spirit of private initiative which our kinsmen largely owe to their Anglo-Saxon descent. Not only the States, but the towns throughout the Union, have taken up the question; societies and institutes have sprung up, it being calculated that since the War over six millions sterling have been expended by private generosity in this direction alone. The entire freedom from legislative restraint,—which, of course, M. Regamey as a Frenchman amply dwells upon,—possesses the great advantage of allowing of constant improvement and of changes in accordance with the necessities and conditions of each case. The only point in which the Legislature have had a word to say is in declaring obligatory in the schools the teaching of drawing; every town of 10,000 inhabitants being further obliged to support an industrial art school. As is noticeable in the matter of general education, every one has been only too happy to adopt the new method, and in the course of a very short time it is confidently expected that every portion of the country will be provided with its organised system of art instruction.

It is needless here to speak at any length of the various methods adopted; M. Regamey's work supplies all the necessary information to those interested. The writer, in addition to lengthy explanations of the systems in vogue, reproduces a number of representative pupils' drawings from each of the successive classes, studies from the antique, from the life, and the classes of modelling and anatomy. Suffice it to say that accustomed to the French system, the author

\* See *Builder*, vol. xli., p. 571.



was surprised at the simplicity of that adopted in America. Routine and tradition are two obstacles which, on the other side of the Atlantic, have not, as yet, come to interfere with progress. A large share of independent action is left to the pupil, who is gradually led up from easy tasks to those more difficult, the artistic intelligence being especially developed through the combined exercise of the eyes and the mind; some of the professors even adopt a system of drawing from dictation.

This is eminently characteristic of the whole movement. There exist in practice throughout the country several systems of art instruction, and each has its advantage, and is supported by competent authority. Drawing throughout Massachusetts has been introduced into all the schools, and there is already what may be termed a native supply of professional talent.\*

The work of the schools has been further assisted by the formation of the numerous special schools and art institutes which have sprung up within recent years all over the country. Nearly every large city has a number of these institutions. Boston has possessed, of course, for a long time several important and interesting art-institutions, the value of which has recently been largely increased by such practical additions as the school of industrial design recently founded by the manufacturers of the city, a school formed somewhat after the fashion of the *Musée Industriel* at Mulhouse, to educate native weavers and designers of woollen stuffs and cottons. New York is not behind Boston, with its Academy of Design and Cooper Institute, and Metropolitan Museum, founded somewhat on the model of our South Kensington Museum. Baltimore has its Society of Decorative Arts and the Peabody Institute; Chicago, its Academy of Design; but it is needless to name the numerous art institutions which now exist throughout the States, and all eagerly endeavouring to supply themselves in Europe with specimens of old art to serve as models for the production of a new art, which they feel can alone possess originality in proportion to its acquaintance with the works and traditions of the past. Young American painters, sculptors, and architects are crowding every artistic centre in Europe, and out of all this enthusiasm and energy, out of all the patronage practised, something before long must be produced. It was some German philosopher, we believe, who sighed out the statement that America was born at the sunset of humanity; rather let us trust, as she does herself, that she is born at the rise of a new existence, when the industry of the world, still young after its toils of toil, is about to take a fresh departure.

M. Regamey's work in more respects than one is most instructive, and though, like so many other books of its class, it is doomed before long to see its informaton rendered out of date, it will serve the inquirer and the historian of the future with one more element of invaluable evidence of the steady and earnest progress of the wonderful continent beyond the Atlantic.

#### MONOLITHIC CHURCHES IN ABYSSINIA.

At the last sitting of the Paris Academy of Inscriptions and Belles Lettres, M. Raffrey, who has recently returned from his travels in Abyssinia, gave an interesting description of a number of churches he had seen there which are hewn out of the solid rock. These unique structures he found in the town of Lalibeha, the capital of the province of Lesta. The place lies in a remote and out-of-the-way region, and is situated on the side of a rocky mountain. It is regarded as a holy city by the Abyssinian Christians, and is visited by numerous strangers who come to pray near the sacred relics there preserved. There are ten churches in the city, but they are not conspicuous to the eye of the traveller, inasmuch as they form integral portions of the mountain. The mode in which their architect had proceeded in constructing them was, in the first place, to have the stone quarried away in such a manner as to leave an immense solid block of rock in the middle. This block, of course, still continued to form part of the mountain. The next step was to give this mass of rock externally the form of a church. It is, in fact, so finished that it is made to appear as if built of ordinary cubes of stone masonry, the

junctions of the different stones being imitated very plainly. Finally, the block was hollowed out, the apertures being so made as to serve for doors and windows. The interior exhibits pillars, vaulted roofs and arches, all being executed in a neat and workman-like manner. These churches are, accordingly, a species of monolith, and appear to be almost unique amongst works of architecture. M. Raffrey, in his paper, gave a special description of each of the chapels. He stated that the architect and builder of them was a certain Sidi Meskal, who had constructed them with the assistance of a body of Egyptian and Syrian workmen, the chief implement used being the pickaxe. The tradition of the place is, that all these churches were constructed within a period of twenty-three years.

#### THE HAGIA SOPHIA, CONSTANTINOPLE.

A DETAILED report on the condition of the Hagia Sophia, which has become worse since the repairs completed by the architect Fossati in 1879, is published by the *Norddeutsche Allgemeine Zeitung*. The serious danger was first noticed by Prof. Bernardo Ferrari, honorary member of the College of Engineers, Genoa, and it is owing to his efforts that the attention of architects was called to the matter. A Commission appointed to inquire into the state of the edifice, however, could do no more than agree to a report of Ferrari's, which points out the danger, and insists on the necessity of a thorough examination being made of the building by a competent architect. It is now stated that, entirely ignoring Prof. Ferrari, an Italian company has made proposals to the Sultan for carrying out extensive repairs, and, according to the report, it is not at all improbable that the dentist of his Majesty will be placed at the head of an undertaking upon which depends the preservation of one of the most interesting edifices in the world!

#### THE GRAND STAIRCASE OF THE PALACE AT WÜRZBURG.

AMONGST the numerous examples which Germany possesses of mansions erected in the style of the later Renaissance, perhaps none are more pleasing than the palace (called the *Residenz*) at Würzburg, in Bavaria. This stately and magnificent building was formerly the Episcopal Palace of the Prince-Bishops of Würzburg, and was commenced on the 22nd of May, in the year 1720, by Prince-Bishop Philip Francis von Schönborn. In the *Würzburg Chronicle*, however, he is spoken of as *John Philip*. The works were continued by Prince-Bishop Christopher Francis von Hütten, 1724-1729, and were completed by Prince-Bishop Frederick Charles von Schönborn, 1744. The architect was Johann Balthasar Neumann, who succeeded Petri as State architect. The Palace is of vast size, and encloses within its walls one church, five halls, 312 chambers, twenty-five kitchens, and a theatre. It is lighted by 947 windows, and is constructed of very beautiful light sandstone.

The most interesting feature about the building is the great entrance-hall with the principal staircase, of which we give a view. This hall is divided into a nave and aisles on the ground-floor by the columns supporting the upper flights of stairs; but above these it is all in one span. The architect has taken great pains to mask the soffits of the upper flights of the stairs, which he has effected by means of a singular arrangement of vaulting. In order to make the vaults range with the stairs above, each compartment has to be differently treated. We cannot help thinking that it would have been better to have had the columns of different lengths, and to have kept the vaulting similar over each bay; be that as it may, Neumann must have the credit of having tried a very bold and original experiment, and one well worthy of study. Of course, his object was to keep the capitals of his columns all in a line, and such a treatment is undoubtedly more agreeable to the general feeling of Classical architecture than the plan usually adopted of increasing the height of each succeeding column, or that of making equal columns stand upon a raking podium. The great defect of the system is the contrast between the cross vault and domical vault,

which certainly breaks up the harmony of the general design. It is interesting to compare this staircase with two others which we have illustrated in the *Builder*,—one is that of Ashburnham House, supposed to be the work of Inigo Jones, and the other is a Gothic staircase at Ratibon. Of course the Würzburg staircase is very much larger and far more costly, as to material, than the others, but still it may be questioned whether, for domestic purposes, it can be said to have the advantage. It is, however, splendidly suggestive for the approach to a great theatre or concert hall. It would be difficult to construct a staircase which would be safer in a panic or sudden rush of people, and this makes it well worthy of study by builders and architects just at the present time, when the question of safe egress from our great places of public amusement is fraught with such painful interest to all who are connected with the management or arrangement of such buildings.

#### "WHITE SWAN" TAVERN AND RESTAURANT.

THIS building, which is situated at Nos. 17 and 18, Temple-street, Whitefriars, close to "The Temple," has recently been completed for Mr. John Finley. The ground-floor is constructed wholly in Box Ground stone, and the upper part is faced with red bricks, and has stone dressings and cornices. Entering the building on the west side, there is an extensive luncheon and dining-bar, communicating with a coffee and smoking room in the rear. There is also a counting-house or private room for the proprietor's use, adjoining which is the lift and cellar entrance.

On the east side there are two large public compartments, entered from Temple-street, with an additional entrance from Glasshouse-alley, at the side of the building, and in communication is a commodious room set apart for the use and convenience of workmen for purposes of dining, &c. The yard approached from Glasshouse-alley has conveniences.

Passing through the central and principal entrance, the upper part of the building is reached. On the first floor is a dining-hall, capable of accommodating 100 persons, entered through an elliptical-headed opening fitted with a pair of swing-doors executed in pitch pine. In the rear is a private smoking-room.

The second floor comprises a billiard-saloon, similar in dimensions and fittings to the dining-hall below, fitted with a table by Burroughes & Watts; also a large private room in the rear, and lavatory with all conveniences.

The third floor is occupied in the front portion by bedrooms, and at the back by the culinary department, the kitchen being fitted with a lift communicating with the various floors below.

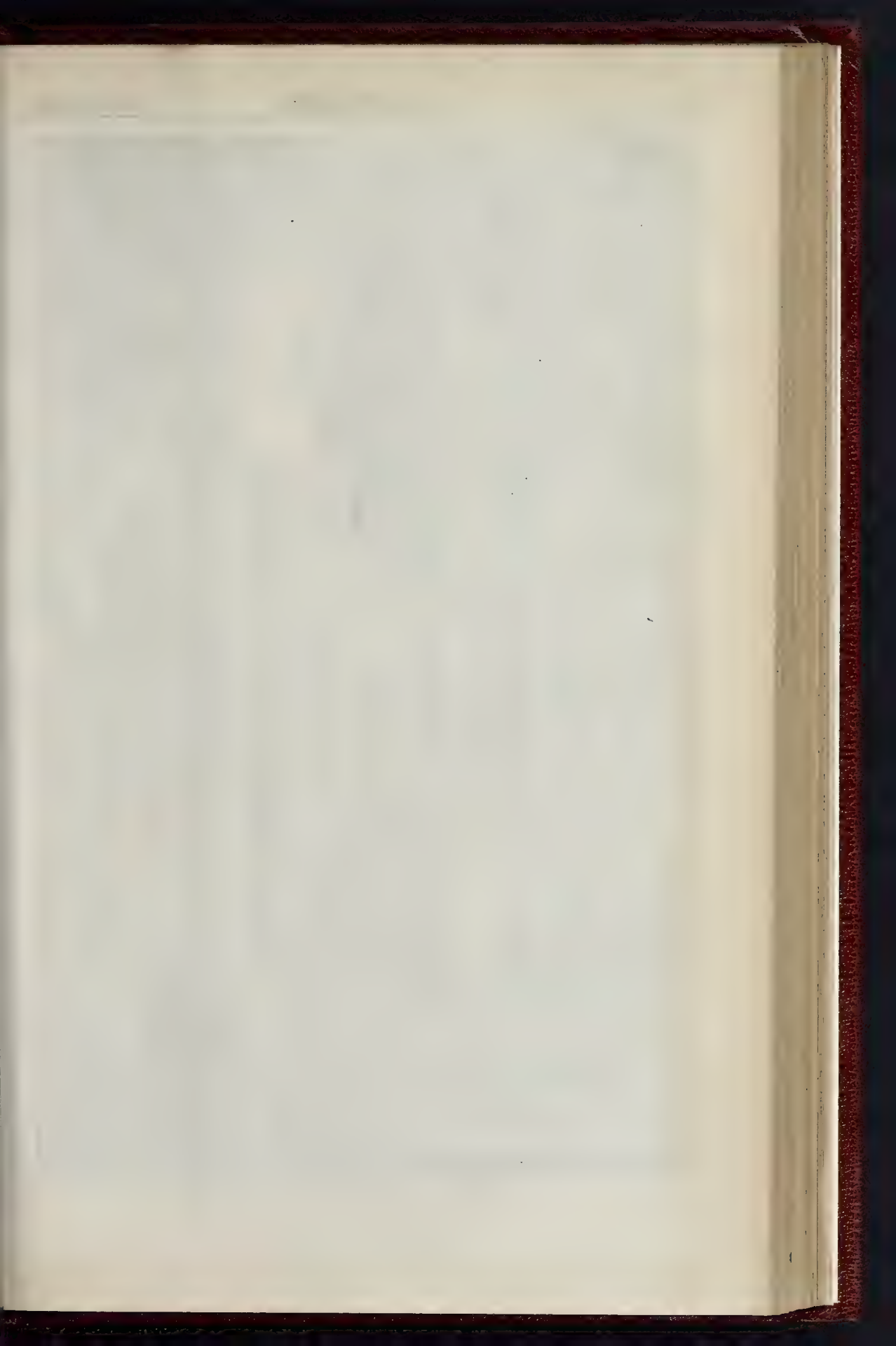
The fourth floor contains further bedroom accommodation.

There is good cellars in the basement. The building has been erected from the designs and under the superintendence of Mr. F. Adams Smith, architect, of 28, Finsbury-circus, the contractor being Mr. Richard Conder, of Ball's Pond-road.

The New Pulpit at the Aberdeen Roman Catholic Cathedral has been made by Mr. Harry Hems, and will cost, including the canopy, about 300l. The whole of the structure is of old English oak—the pillar shafts in the pulpit proper being made of oak which originally formed part of the oak work in the choir of Salisbury Cathedral. The pulpit is octagonal in shape, and has a pedestal base. The outside of the enclosure for the preacher is formed of panelled framing and pillars at the angles of the octagon; the panels are each enriched with a figure subject in bas-relief. The canopy is also octagonal, and rests upon a back of panelled framing, and is also firmly fixed into the stone pier against which the pulpit stands. The canopy has a gabled and cusped arch on each side of octagon, and is surmounted by a square shrine with pillars at the angles, having flanking figures of the four Evangelists, and the figure of our Lord in the shrine. The shrine is surmounted by a high crocketed spire, terminated by the figure of an angel sounding the trumpet, the whole standing about 24 ft. high above the floor of the nave. The design of the pulpit was furnished by Messrs. Ellis & Wilson, architects.

\* It appears that about 95 per cent. of the school population has been induced to draw. About one-third of the school population continues in the higher classes.

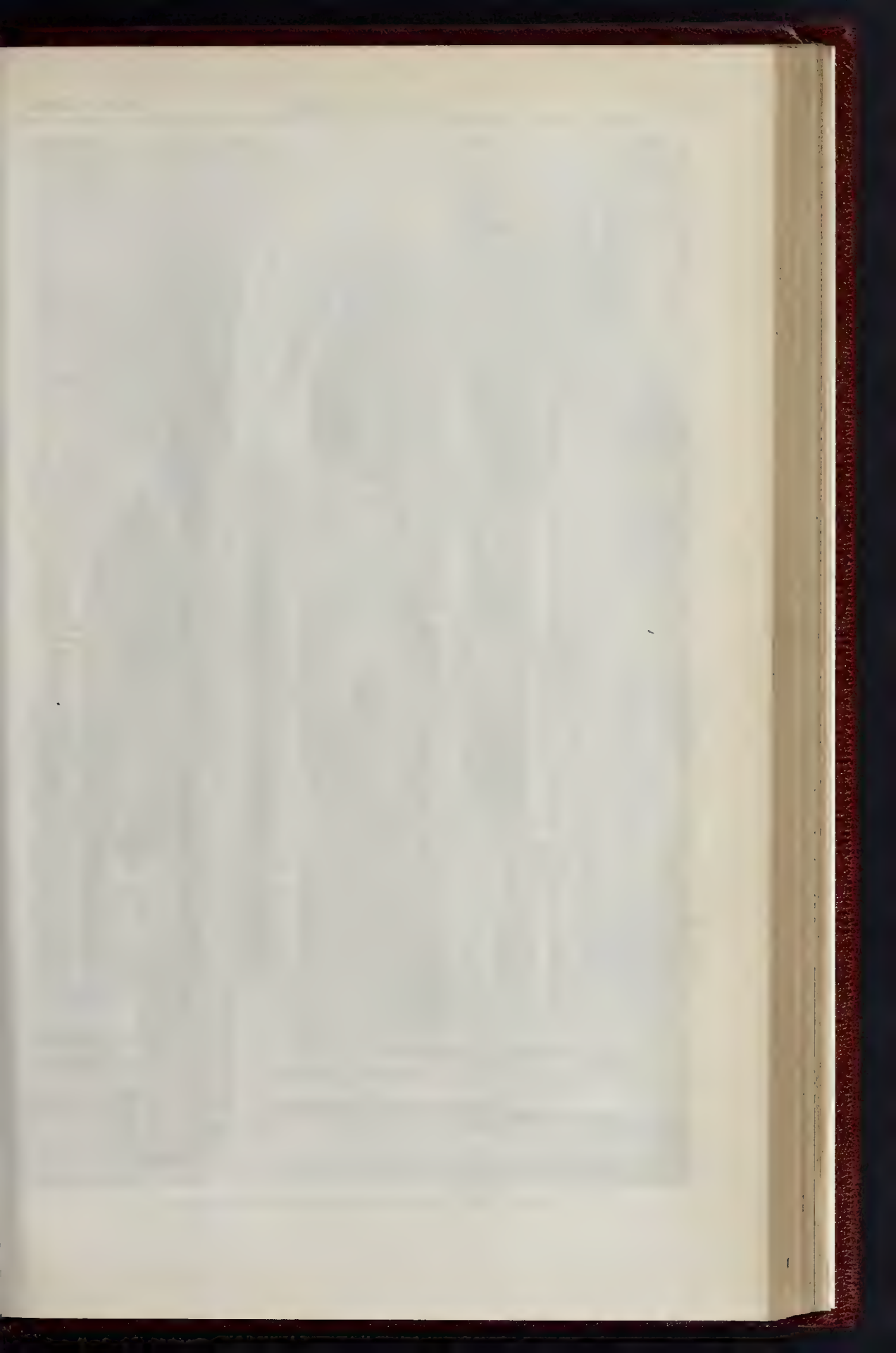






THE GRAND STAIRCASE OF THE PALACE AT WÜRZBURG.





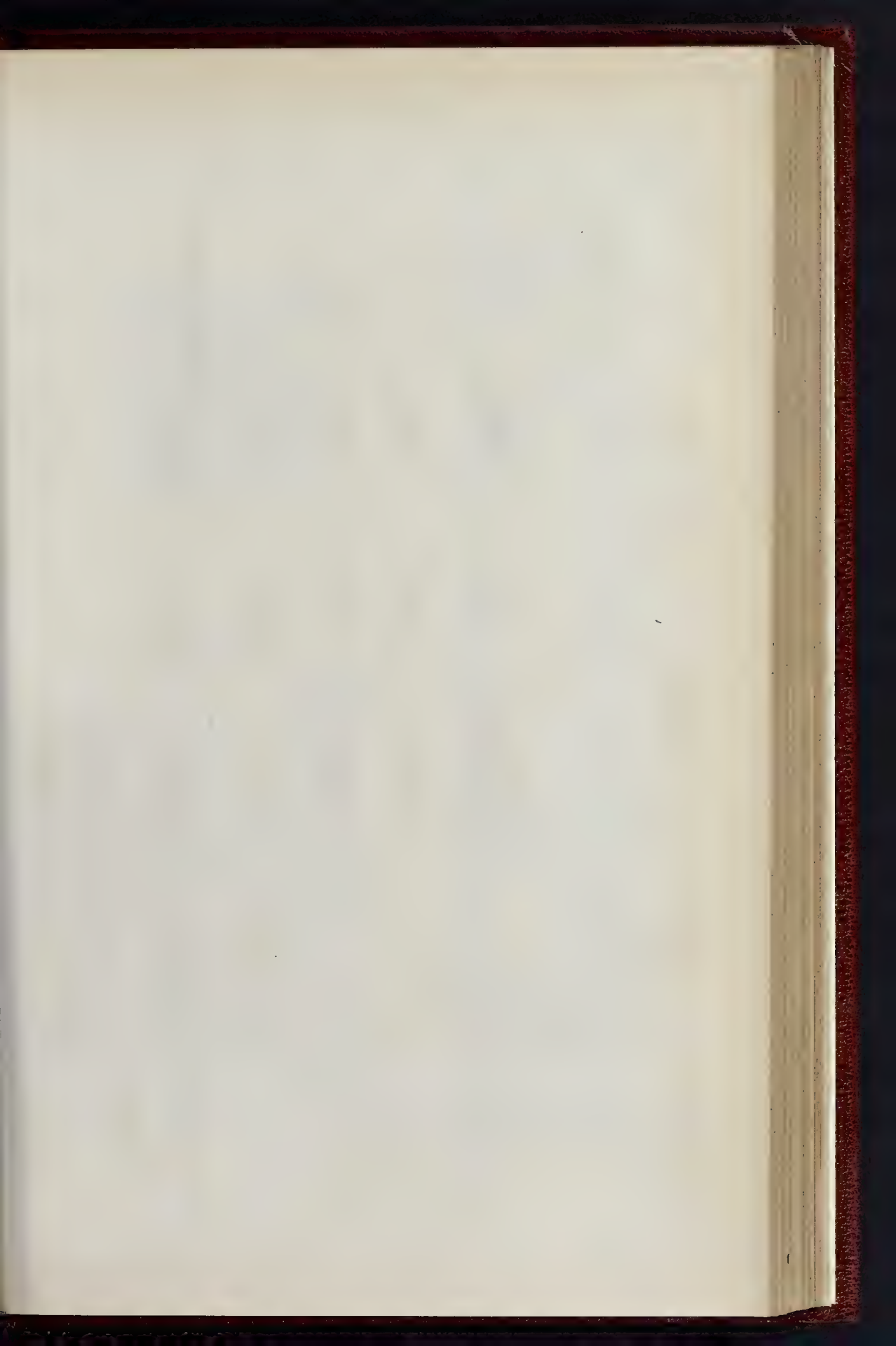


W. Kell, Photo. the Castle of St. John.

Wyman & Sons Printers 17 Queen St.

STREET ARCHITECTURE: TAVERN, WHITEFRIARS.—MR. F. ADAMS SMITH, ARCHITECT.





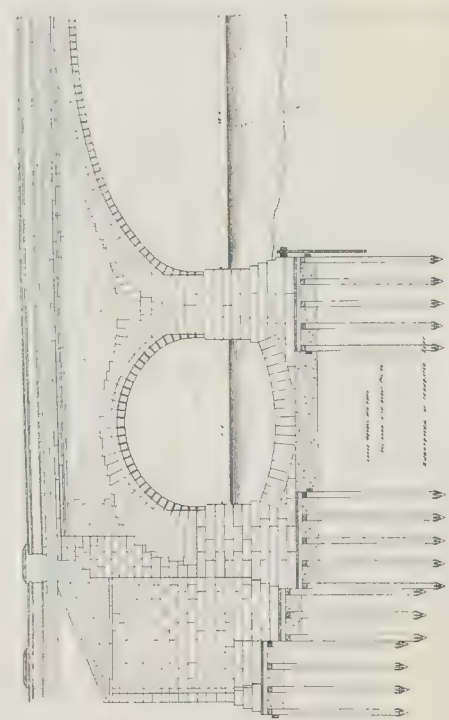
THE BUILDER, MAY 20, 1882

DESIGN FOR A STONE BRIDGE

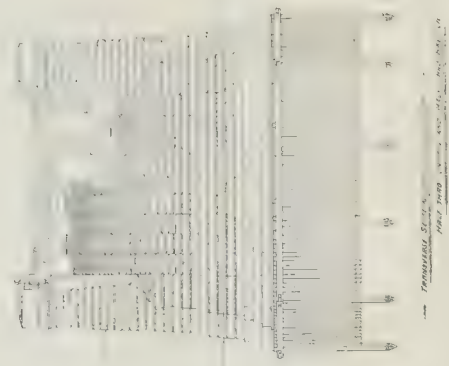
DRAWING NO. 1.



ELEVATION OF BRIDGE



PLAN OF BRIDGE

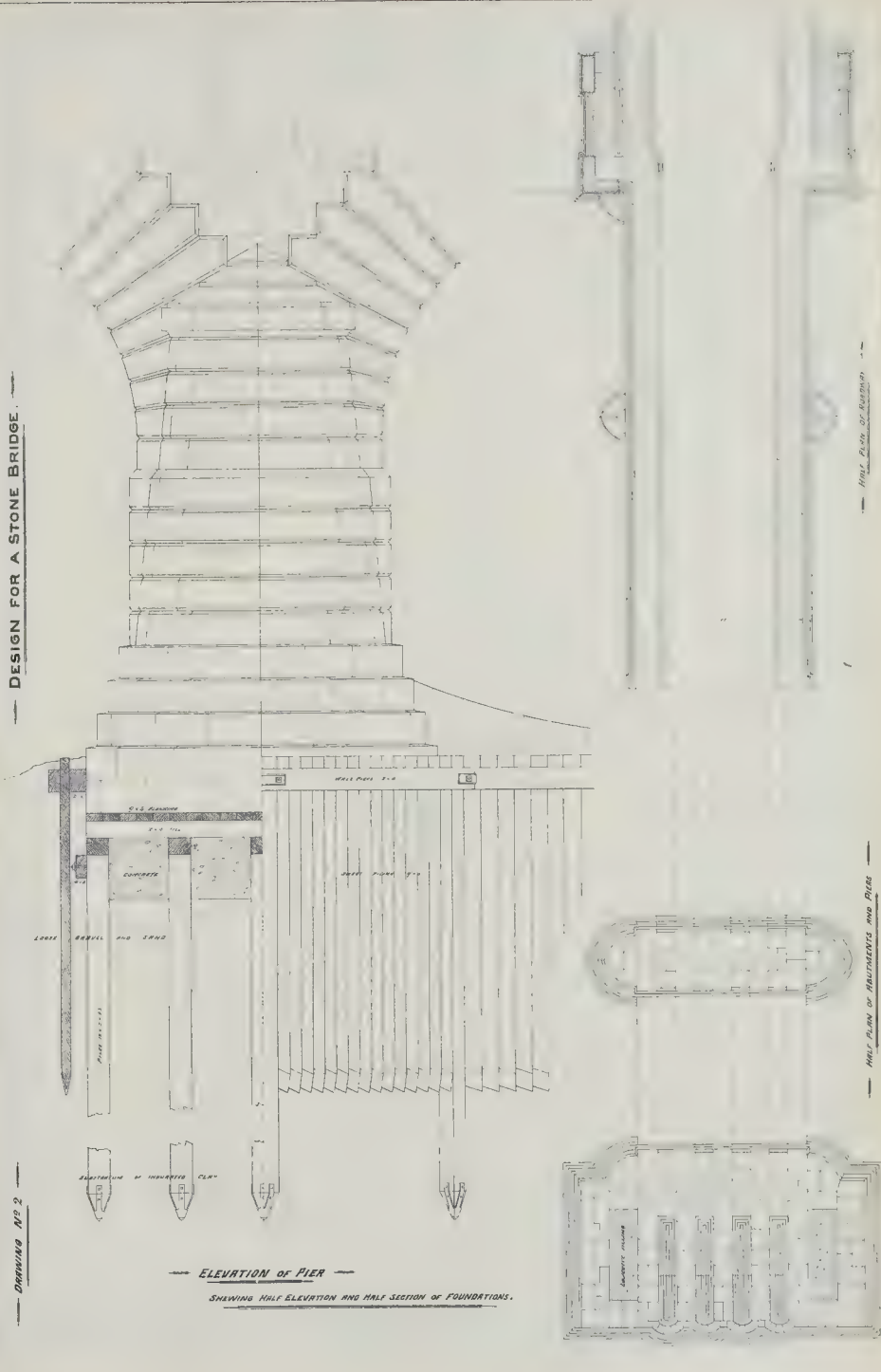


SECTION OF BRIDGE



DESIGN FOR A STONE BRIDGE.

Drawing No 2



Whitcomb & Co. Engineers, New York.







C.F. Kell, Photo-Litho Castle St. Holborn.

Wyman & Sons, Printers G'Queen St'

DESIGN FOR A STAMPED LEATHER BOOK-COVER.—By G. C. HAITE.





# PRIZE DESIGN FOR A STONE BRIDGE. GRISSELL GOLD MEDAL, 1882.

We illustrate this week the design for a stone bridge, to which the Grissell gold medal has recently been awarded by the Royal Institute of British Architects. The conditions of competition required a stone bridge for road and foot traffic, 30 ft. wide between the parapets, with a waterway of 140 ft., and a gradient not exceeding 1 in 20, the river, 200 ft. from bank to bank, to be non-tidal, with an extreme depth of 10 ft., and navigable for barges, the banks to be on a level, and 20 ft. above the ordinary water-line.

The principal feature of the design is a wide central arch, of 85 ft. span, designed to leave the deeper portions of the river available for navigation, and to facilitate the construction of the piers by their proximity to the shore. The necessary height is obtained by an easy gradient of about 1 in 30, and by raising the approaches from which communication with the banks is provided by flights of steps. By setting the parapet walls out on corbels the required width of roadway is obtained, together with an architectural effect of light and shade and a saving in the width of the bridge works below. The roadway is carried over the bridge on a series of spandrel walls built up from the main arches, which are turned with a corresponding series of arch ribs, well bonded together; the spaces between being not required for constructive purposes, are filled in with lighter stonework, an arrangement designed to increase the architectural effect and diminish the quantity of material, and consequently the weight on the piers.

The bed of the river is assumed to consist of loose sand and gravel to a depth of several feet, with a substratum of indurated clay, on which, by means of piles, the foundations are constructed, the piers and inverted arches under the small openings being surrounded with sheet piling, to prevent the lateral escape of the loose material by the action of the water.

The author of the design is Mr. H. Phelps Drew, 17, Sulgrave-road, West Kensington.\*

## DESIGN FOR STAMPED LEATHER BOOK-COVER.

THE accompanying design for a stamped leather book-cover is given as suitable for a set of volumes or for a private library, space being reserved in the centre of design, as shown, for owner's monogram or crest. It may, perhaps, help to revive interest in a branch of art which has been neglected of late. Without laying claim to any great merit or originality, it may be regarded as suitable for its purpose, a point which is quite lost sight of in the majority of designs of the present day.

## A CHAT ABOUT HOUSE BUILDING.†

THE main use of a house is, of course, to protect us from the heat, cold, and wet, and a building that fulfils these conditions best most nearly answers the purpose for which houses are erected. In order to discuss the matter clearly we will divide our house into its several parts, and as the foundations must be first laid down, we will treat of these in the first place.

### Foundations.

A calculation should be made of the weight of the materials in the proposed building and its probable contents; this would be the weight the foundations must have to carry. Then a margin allowed for safety, which would vary under different circumstances: for instance, a house on a hill would be exposed to a rocking motion from the wind that a house in the valley would be less exposed to; and supposing the margin to be for the house in the valley five times its average weight, and on the hill ten times, I think that safety-margin would be quite sufficient.

I know it is not usual in building houses to make these calculations, but I do not think the usual method is best in this instance; for if an engineer built a bridge he would be able to tell you the exact strength of every part, all the materials would have to pass the test, and would be accepted or rejected accordingly. If a ship-builder built a ship he would follow the same law, and both would be but copying nature, who never uses surplus materials.

A little reflection will, I think, show you that to use materials in a haphazard way is not true economy; and if you put foundations 18 in. thick when 12 in. would answer the same purpose, you are wasting one-third of your materials, and, from want of care, using for the foundations of two houses materials that would, if more judgment had been used, been sufficient for three.

I want you, please, to keep this principle in your mind,—economy of materials and labour, because it is the key-note of all I have to say, and is, in fact, the only point I know of in which great improvements in house-building can be made.

Having found the weight of your structure and added the margin for safety, your next step would be to provide yourself with a crushing-machine to test the strength of your materials. This need not be an elaborate affair: a lever-machine can be constructed with an iron girder and a sliding weight, on the principle of the steelyard, at a trifling cost. The usual test used for Portland cement is a tensile strain. This may be all right, I dare say it is; but I think you will agree with me that, for materials that are to be used in compression, a crushing test is more satisfactory than a tensile one.

Now, then, having decided what weight we have to carry, and having prepared our testing-machine, the next point is, what shall we use for our foundations?

This is a question that can only be answered on the spot; any hard, coarse material will do,—either gravel, flints, rubble, local stone, or whatever comes handiest; the only thing to be guarded against is that we do not, for the sake of cheapness, use a soft and unsuitable material; but here our crusher will help us. Now, with what shall we bind our material together? Shall it be lime or cement, or part of each?

The better plan will be, if the foundations are important, to make a number of experimental blocks, let them stand some time, and then test them by crushing. It might be fairly assumed that materials that give the best results in these instances would harden in the same ratio; and I feel quite sure the result of those experiments would be to prove, in many cases, that the local materials, although the cheapest at first, would not be the most suitable, in all cases, for the purpose.

Having decided what the foundations are to be composed of, and of what thickness they are to be, the question of depth has next to be settled.

When the subsoil is of gravel or chalk, firm and dry, nothing can be better; when, however, it is irregular, care must be used, or the building will settle unevenly, and distortion will follow. It is most essential, when the foundation is at all questionable, that hoop-iron bonds should be imbedded in the foundations; and I have seen very heavy buildings erected in London on the made ground without excavating to the natural subsoil, when, by taking this precaution, the entire building has settled in one without distortion or flaw of any kind.

The buildings I speak of were workmen's model dwellings, and the method was adopted by a late esteemed friend of mine, Mr. Matthew Allen, from economical reasons. I am not recommending this system to be adopted, as, without great care, it might not succeed; still, I think the fact that it has been successfully done should be placed on record.

If the soil is at all damp, the wet will soak into the foundations, and be drawn up into the walls; a wet outer wall is a most annoying result, which must be obviated by a damp course covering the whole of the foundations, and forming the bearing for the walls.

Any material impervious to wet will do for this; but the cost of rectifying any defect is so great that it would be false economy to use anything but the best kind.

I have seen two courses of slates in cement, felt saturated with pitch, liquid asphalt, glazed tiles perforated lengthways, and many other contrivances for effecting this purpose; but for buildings not too heavy I like the perforated tiles the best, as ventilation is combined in this appliance, and any defect is more readily perceived. Our testing machine would show us what weight these tiles would safely carry. And here I would interpose a remark about testing which you may not be aware of.

I was informed, in answer to a question, by a gentleman who has had more practical knowledge of testing materials than any one I

know, and who is considered the great authority in the matter, that he has found hundreds of times that a test made on a small cube bears the same relation to the strength of a larger surface as the size of one bears to the size of the other. Now, suppose a cubic inch of material is crushed by the pressure of one ton, as there are 144 in. in one square foot, it follows that it would take 144 tons to crush a tile of the same material 1 ft. square and 1 in. thick.

This is a most important matter for our purpose, as we can, by comparatively simple means, obtain results that, but for this rule, would, owing to the cost and bulk of the necessary machinery, be quite beyond us.

We have now put in our foundations, put on our damp-proof course, and the next thing we have to do is to commence our

### Walls.

Now we will ask ourselves,—What are the walls for, and what have they to do?

They have to carry the floors and the roof, and they have to keep out the heat, the cold, and the wet.

To carry heavy weights, are bricks and stone the best material? Well, engineers would say at once, "No"; iron is best, as its strength is many times greater than the best bricks or stone. What! iron walls, you say! No, not quite that; but iron stanchions wherever weight has to be carried.

Let us take a walk down a main street and look at the shops,—those massive buildings,—some brick, some stone; and here they are, all stuck up in the air and standing on iron columns, looking ridiculously small for the weight they have to carry; and if for trade purposes iron columns and an iron breastsummer is used on the ground floor, why not on the second floor, where there is less weight to carry? If on the second, why not on the third and fourth, and why not dispense with the brick and stone in the front altogether?

If this arrangement will do for the front, why not for the back and the sides? In fact, why not put up a skeleton house all iron uprights and cross-pieces, and leave the filling-in for after consideration?

This plan will do equally well for erecting houses. Having formed the foundations, raise on them a skeleton framework in iron of the building you are about to erect.

The strength of iron is well known, and many large iron dealers now publish tables giving the actual strengths of the different sections they sell; by this means it will be easy to calculate with certainty beforehand the strength your wall will be, so that nothing need be left to chance, and no risk need be run.

In many cases wood may be substituted for iron, as it would be protected inside and outside by the inner and outer skins; it would last as long as the wood stowwork or lath-and-plaster partitions, which, as is well known, often last for two or three generations.

There ought to be no difficulty in keeping the weather out; the shops do it most effectively with glass, now mostly plate,  $\frac{1}{4}$  in. thick; but in old shop-fronts you will find sheet, and in older ones crown, no thicker than a sixpence, yet keeping out the wet better than your brick wall or your stone wall, however massive you may make them.

This teaches us that the surface of the outer wall must be waterproof. In some old houses the bricks were glazed, the joints then would be the difficulty; but a glazed surface is not pleasant for walls; no one likes it, and I know of no substance that combines all the qualifications for an outer wall equal to Portland cement.

We have travelled along very comfortably so far, and I should be sorry for you to say, "Now you are going to mount that hobby, I'm off," so, if you will kindly listen to me, I will promise not to mount my hobby, only to trot him up and down a bit, just to show off his points, and what he is capable of. Well, here is a material you can mould into any shape; you can colour almost any shade; you can carve to any design. Any plasterer or bricklayer has some knowledge of its properties; it can be purchased almost anywhere; it is harder than stone; quite impervious to wet; practically indestructible, and, until you can tell me of something better, this is the material I should recommend. I wish people were not so prejudiced against new materials. Old and well-tried things are not to be lightly thrust aside, I know; but when they have failed again and again, when our best men have erected buildings in exposed situations of

\* Another page of details will be given in our next.  
† By W. H. Lascelles, Builder.



brick and stone, which, in spite of all precautions, have not proved waterproof, I think, and I know you will agree with me, that another system, which promises to rectify the defects at present existing, should have a fair trial.

The outer skin should be strong enough to withstand ordinary wear and tear, and I think 1 in. is sufficient thickness for the ground floor, and less than this would do for the upper floors, say  $\frac{3}{4}$  in. I would make the cement in slabs or tiles, say 18 in. by 12 in., and about  $\frac{1}{2}$  in. thick, with a roughened face; they can be fastened with wire to light iron uprights, or with screws to wooden stanchions, and the outside can be finished as rough cast, with red tiles the size of bricks, with slab-tiles resembling stone, with thin sheeting framework, as half-timber work, or in any way your fancy may suggest. I know I am on ticklish ground here, so I will leave you to do as you like. And now I have trotted my hobby a bit, trot out your own, and put what you like, how you like, and as you like.

Now we will talk about the inner skin, and there I would put the same plain cement-tiles, with the roughened face, and would finish with a coat of lime and sand in the usual manner. We have been taking such liberties with ordinary construction that I think it is time to come round a bit, and admit there are some things we cannot improve on, and I know of nothing better than lime and sand for inner walls, as it gives a good hard smooth surface that will absorb any ordinary moisture a room is likely to contain without showing spots of damp.

The hollow space between the inner and outer skin we get by this system is of great service to us, as the air thus confined is an admirable non-conductor of heat and cold, and a thin hollow wall is as good a protection against extremes of heat and cold as a thick solid wall, and as a protection against damp it is far better.

#### Floors.

We will take the basement floors first, and start with the assertion that wood for this purpose is wrong, because, being next the earth, it decays sooner or later, and the damp decaying air is continually being drawn through the floor-board joints by the fire.

Every basement floor should be in one piece, and air-tight, and should be raised above the ground, because if there is no air-space underneath, and it is in contact with the cold earth, any moisture in the atmosphere is condensed on it, and it is almost always damp, which has a most uncomfortable appearance, and renders it unfit for most purposes.

A good plan is the very, very old one of connecting the space under the basement floor with a flue in the chimney, and letting the air that passes underneath pass round a furnace on its way in. By this means it is warmed, and the warmth benefits all the building; in that case the hot air can be allowed to circulate between the double outer walls before it enters the flue, and the entire apartments are clothed with a blanket of warm air. This is, of course, the best plan.

Cement looks cold for a basement floor,—looks, in fact, much colder than it is; it can, however, be covered with wood, either as boards or parquetry, or with carpet, felt, or matting. The great thing is to keep the floor and joists away from the ground. Have a floor in one piece, impervious to air and damp, with a space under, and cover it with what you like.

The air-space, if not connected with a furnace, should have air-bricks in the outer walls to promote circulation, and if connected with hit-and-miss air-bricks by the grate, can be kept continually renewed by the draught from the fire, or it can be carried into the fire.

So much for the basement; now we will speak of the other floors, and we will lay down the law that these floors must be fireproof.

By fire-proof I mean that if the furniture usually kept in a kitchen should by any means take fire, the ceiling and floor above should be so constructed as to prevent it spreading in other directions.

I would take nothing for granted in this matter, but would satisfy myself by direct experiment that this result had been attained. I do not mean I would try to burn down the house to see if it were all right, but when the house was in the process of construction I would put as much wood and shavings as would represent its contents and rather more, and set it alight, letting the flames play out of the windows, for I know no way of making windows fire-proof, except

by using iron shutters. There is not much difficulty with doors, if the door is made in two thicknesses, with a sheet of iron between, that would be sufficient: this, also, I would test by actual experiment.

There is nothing more comforting than the feeling that all is safe. When you have an uncomfortable feeling in the middle of the night that there is a curious noise downstairs which sounds like fire, it is a great thing to feel that there is no cause for alarm, and that if a fire should have broken out it cannot extend from the room where it has originated.

Beyond laying down the proposition that all rooms should be fireproof, I do not dogmatise as to the way this should be done; there are numerous ways of doing it. If you accept my doctrine, that is all I care about, but, all things being considered, the cheapest way is the best way, and if this most desirable result can be obtained at the same cost as an ordinary lath-and-plaster ceiling with joists and floor over,—and I fancy it can,—I do not think there can be any doubt as to which is the best plan. So we will take a ceiling 24 ft. long by 18 ft. wide, and see how it can be treated.

First, I would divide the length into three by putting two iron girders across, this would reduce the bearing from 24 ft. to 8 ft., then I would put iron joists 1 ft. 6 in. apart and 16 ft. long, breaking the joists alternately, and this would be my framework.

Now, if you take a piece of paper and set it out to a scale, you will see how this is done.

The girders may show as beams in the room below, and can be cased in thin wood, or lath and plaster, or cement, or stamped paper, and the joists can either be covered on the underside with slabs of any of the above materials, or each joist can be cased separately and show below. Wood and stamped paper sound rather queer fireproof materials, I know, but the fact is, no building is absolutely fireproof, but only relatively so, and bearing in mind the proposition I started with that everything should be tested, nothing should be sacrificed to prejudice. I would roughly test everything as I went along. Satisfy yourself that you are right, and do not care a button for what other people say if it will do the work that is required; that is everything, and when you have tried it you will be surprised to find, as I have been, what simple arrangements will withstand any ordinary fire.

Do not place implicit faith on pretty pictures and paper experiments; put them all through the crucible of experiment: it is by experiments all great discoveries have been made, and the results obtained are often quite different from what with our previous knowledge, we have anticipated.

I have said this a chat, and such I wish it to be, but it would be wasting your time as well as my own if I were merely entertaining you with wild dreams that could never be realised, or advising you to try experiments when I had done nothing of the kind myself. Please, therefore, understand, that although I do not want to bother you with figures, I have myself tested the matters I am speaking about, and have quite convinced myself that the thing is right before I have tried to convince you.

We are getting on pretty well; we have put in our foundations, built our walls, put in our beams and our joists, formed our ceilings, and now we come to the floors.

Nothing I know of is so good as concrete slabs laid like paving on the iron joists; they need not be very thick,—an inch will do in most cases, an inch and a half is strong enough for any dwelling-house, and they possess the following advantages: they are fireproof, waterproof, good non-conductors of heat and cold, can be sent by road or rail without much breakage, are inexpensive, and can be laid by any ordinary mechanic. Now there is a testimonial it will be difficult to beat; still I do not preach finality, all I ask you is to try them, and if you think you know anything better try that as well. I do not hold up concrete slabs as invincible; admit the principle that floors must be fireproof, and make them of what you like.

The under-side, if seen, I would plaster with lime and sand; then whiten, or paper or decorate, as you like. The upper side I would make with a roughened surface to take a finishing coat. This might be done in thin parquet or coloured cement, or a parquet underneath in cement centre, or tiles in any pattern. But a plain-coloured cement floor is what I would prefer, although I know people will say, "Dear me, how cold it must be!" Well, I have tried it,

and it is not. I have known people who have lived in houses where all the floors, bedrooms and all, were cement, and they will tell you they are most comfortable, and although at first they were prejudiced against them, after this was overcome they liked them better than wooden floors. When you are on the Continent you do not object to the cement floors; you like them because they are clean and cool, and free from dust; you note how easily they can be washed, and how solid and firm they look; you do this because you leave some of your prejudices behind you when you leave your dear old England, but when you return on this side again, and what is very good on one side of the Channel is very bad on the other.\*

#### ST. PETER'S HOSPITAL, COVENT GARDEN.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a number of the members of the Architectural Association visited the new St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, which is now so nearly completed that it is expected to be formally opened on the 29th of June by one of the royal princes. The building is being erected from the designs, and under the superintendence, of Mr. J. M. Brydon, architect, and has a frontage of 120 ft. on the north side of Henrietta-street, the back of the building extending for the same distance along the south side of the churchyard of St. Paul, Covent Garden, which is, we understand, about to be laid out in an attractive manner at the cost of the Duke of Bedford. The building comprises six floors, viz., basement, ground, first, second, third, and attic floors. The principal entrance is on the ground floor in the centre of the façade, but there is an out-patients' entrance at the east end. On each side of the principal entrance are two shops, extending from back to front of the building,—a distance of about 30 ft. The basement floor, on either side of the space beneath the entrance-hall, is divided laterally by brick walls, the front and larger portion of the basement, towards Henrietta-street, being appropriated to the shops, and divided by cross walls, so as to keep each shop and basement distinct from its neighbours,—the back portion of the basement, looking out over an open area on to the churchyard, being appropriated for hospital purposes, communication from top to bottom being by means of staircases and lifts. The hospital portion of the basement comprises mortuary, post-mortem room, drug-store, porter's bed-room, and store-room. The whole of the main walls rest on concrete, 2 ft. 9 in. thick, and the entire surface of the basement floors is covered with a layer of concrete 6 in. thick and finished with cement. The first floor, approached by the central staircase as well as by the one for out-patients, comprises an out-patients' waiting-room, capable of seating from 150 to 200 persons, together with consulting-rooms, lavatories, &c. In the centre of the front part of the building is the secretary's room, and westward of that sitting-rooms and bedroom for the resident surgeon. Westward of these is the Board-room, about 29 ft. by 19 ft. 9 in., corresponding in these dimensions to the shop below it and to the other shops. The second floor is devoted to two large public wards, each 40 ft. 9 in. long by 29 ft. wide by about 15 ft. high from floor to ceiling. These wards are placed one on either side of the main staircase, and between them, on the south side of the building, is the nurses' room. At the end of each ward are, on the north side, two water-closets and a slop-sink, and on the south side a bath and lavatory. Through ventilation will be obtained for these by means of windows in the north and south walls of the buildings. Each of these wards will contain twelve beds,—six on each side,—so that the two wards will provide for twenty-four beds. In the centre of each ward will be one of Boyd's hygienic warm-air ventilating stoves,—the same maker's hygienic grates being used throughout the building. The third floor comprises kitchen, scullery, stores and larder, bed-room and sitting-room for the matron, and three small wards for paying-patients,—one containing three beds, another two beds, and the third one bed,—so that the hospital will, in all, make up thirty beds for in-patients. These wards are, of course, provided with accessories in the shape of bath-

\* To be continued.



rooms, lavatories, and water-closets. The attic floor is appropriated to bed-rooms for the nurses and female servants of the establishment. The central staircase is very light and airy, and in the centre of it will be a patients' lift. This and two other lifts are to be supplied by Messrs. Archibald Smith & Stevens, of Leicester-square. The ventilation is to be effected by the windows and stoves for the admission of air, and by means of extraction-shafts leading from the ceiling of each room and ward into a large main trunk, 5 ft. square, running east and west in the roof, and discharging its contents into the louvred cupola which forms the highest and most central feature of the building, and in which will be a gas rarefer or burner. The building is a lofty one, and is designed in the Queen Anne manner. Corbelled out over the central entrance is a Portland stone maligned bay, extending upwards through the first and second floors. The centre above this is emphasised by a gable, behind which rises the cupola before mentioned. At each end of the main frontage is a projecting turret, giving emphasis to the extremities of the facade. Between these turrets and the central gable are dormer windows, lighting the bedrooms in the attic floor. The roof, which is of high pitch, is covered with Broseley tiles. The facade is in red Woolpit bricks, relieved with pilasters and panels carved in red bricks supplied by Mr. Thomas Lawrence, of Bracknell. The entrance doorways, the piers between the shops, and the cornice running over the shops at first-floor level, are in Portland stone. The eaves cornice is in Mr. Lascelles's concrete, painted white. The floors throughout are constructed of iron and concrete by Messrs. Homann & Rogers. There are three distinct supplies of water,—one for the baths, water-closets, and slop-sinks; one for culinary use; and one for drinking purposes,—in addition to a separate supply for the hot-water apparatus to be fixed by Mr. Boyd. The gasfitting is in the hands of Messrs. Buckley & Beach, of Chelsea. The frontage towards the churchyard is, unfortunately, very plain in character. A red brick front was at first intended, but was cut out, to save expense. The floors of the wards and rooms are to be covered with pitch-pine, polished, laid with boards 3 in. wide.

The general contractors are Messrs. Mark Patrick & Son, their general foreman in charge of the works from the commencement being Mr. W. H. Barnes. Mr. G. Chincock is the clerk of the works.

#### NOTTINGHAM SCHOOL OF ART.

The annual distribution of prizes in connexion with this successful institution took place a few days ago.

Mr. George Augustus Sala was among the speakers, and in the course of some acute remarks he said he had recently returned from Paris, and when he went to Paris he generally went to a certain hotel on the upper boulevards, because he was next-door neighbour to one of the most famous artists in bronze in Europe,—Barbedienne's, in the Rue de la Poissonnière, where there was a shop filled from end to end with the wonders of the bronzeworker's art. They knew what art bronzes were,—how magnificently they were finished, how excellent was the modelling, how capital the chiselling; but, looking at all the achievements which had gained for Barbedienne his world-wide fame, he could not but regard them with some feelings of sorrow and humiliation that works so splendid were not produced on any considerable scale in this country. They knew what the Messrs. Elkington had done in Birmingham; they had produced magnificent bronzes, enamels, and wood in repoussé; but he had been told by them that the long run it was the spoons and the forks and the dessert-knives that had to pay for them; and that few and far between were the works of art bronzes of which they were able to dispose, owing to the competition of the foreigners. But they must not grumble at that, so long as they modelled better than the English; for the magnificent shields, and candelabra, and statuettes which they produced showed how much better was the modelling of the foreigner, who had in general a facile hand, especially in works of bronze, where the foundation was modelling; and by this knowledge the foreign workman was enabled to go from the largest achievements of art to a child's toy, because he had to model in wax and clay when he was young. He

knew modelling formed part of the training in that school, but when the young student commenced, as soon as they could see whether the pictorial or graphic faculty was predominant, if the faculty was for modelling, he should be trained carefully in that direction, not with the view of making him a great sculptor, but a great art-workman. And that led him to another branch of his subject, and in briefly dismissing it he hoped he would tread on no corns, on no toes, and wound no susceptibilities. He took it for granted he was addressing an earnest, capable body of students of both sexes, determined to excel, full of passion for hard work; and among them there might be many who had achieved excellence in design,—had produced exquisite designs for lace, and copied noble studies of the antique in chalk, and had now developed in them a faculty for doing work which they thought much better. The eye for colour has been opened, and the artist's faculty for drawing begun to be exercised in pictures, or perhaps a portrait of a beloved relative, a landscape, or some historic subject. The student then folded his arms, saying, "I am a painter; I will go up to London, or send up my picture to the Royal Academy, or the Society of British Artists." His advice to those was: "My young friends, do nothing of the kind for the present. If you are destined to be great painters, the faculty will one day assert itself; but for the present stick to design, be it drawing designs for wall-papers or lace curtains." They must remember they had a duty to themselves, to the grand old city of Nottingham, to the great employers of labour in it, and finally they had a duty to their country. He was a man of peace; he had seen too much of war in its most active and revolting forms not to loathe and hate it, and feel sick and grieved at the very name of war; he did not want to cut the throat of the foreigner, but also he did not want the foreigners commercially to cut the throat of his countrymen.

#### CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

The general meeting of this society was held at the Society's Rooms, 7, Westminster Chambers, Victoria-street, on the 4th instant, Mr. A. T. Walmisley, president, in the chair, when the annual report of the council was presented.

It was stated that the society was established in 1859, and has since been doing good service among the junior members of the profession, many of whom were connected with the Institution of Civil Engineers, and who found the Civil and Mechanical Engineers' Society gave them opportunity of reading papers and taking part in discussions which would give them confidence, and so enable them to prove the more useful members of the senior body. In addition to this the society was useful as a social society, and as affording opportunity for all its members to become well acquainted, and to visit various works in progress during the summer months of the session.

The following gentlemen were elected officers for the ensuing session, viz. :—

President.—Mr. R. Harkness Twigg, M.I.C.E.  
Vice-Presidents.—Messrs. H. Sandall and Thomas Cole, M.I.C.E.  
Council.—Messrs. E. H. G. Brewster, Jno. Coates, A.M.I.C.E., F.G.S.; W. E. W. Crane; H. G. English; H. Howard, A.M.I.C.E.; R. E. Middleton, A.M.I.C.E.; H. T. Munday, A.M.I.C.E.; H. M. Whitley, A.M.I.C.E., F.G.S.  
Auditors.—Messrs. G. C. Child and W. H. Milnes.  
Hon. Solicitor.—R. H. Willcocks, LL.B.  
Hon. Treasurer.—Wm. C. Street, A.R.L.S.A.  
Hon. Secretary.—G. A. Pryce Cuxson.

#### THE AGRICULTURAL HALL COMPETITION.

In the competition for the proposed additions to the Agricultural Hall, Islington, the designs sent in by Messrs. Verity & Hunt, of Regent-street, and marked "Q. E. D." have been awarded the first place by Mr. H. Currey, the appointed assessor; and these gentlemen have accordingly been called in by the committee to carry out the works. The following is an extract from Mr. Currey's report :—

"The plans of each competitor have been carefully studied, and I have felt some difficulty in determining which is the best; but, after a careful examination of details, the design marked 'Q. E. D.' commends itself to my judgment as deserving the first position."

#### THE TOTAL DESTRUCTION OF THE BERLIN HYGIENIC EXHIBITION.

It was only on Friday in last week that we announced in these columns that on Tuesday, the 16th inst., the large and important Exhibition of Hygienic Appliances at Berlin was to be opened by the Crown Prince of Germany. Before the day on which we made the announcement had closed, however, the entire building, together with all its varied and valuable contents, had been reduced to ashes. It was only a few weeks ago that we described the total destruction of an exhibition by fire at Porto Alegre in Brazil. That was after the exhibition had closed, and arose from the wanton Vandalism of a drunken mob. In the case of the Berlin Exhibition, on the other hand, the destruction has taken place only a day or two before the date fixed for the opening. The cause of the calamity in the German capital appears pretty clear. The material employed in the structure itself consisted mainly of old timber, which had to a large extent been covered with tar and oil paint. Owing to the dryness of the season, the wood was in a very inflammable condition. The fire arose in the refreshment department, and spread with extraordinary rapidity. It broke out a little after seven in the evening, and before eight o'clock the entire edifice and all its valuable exhibits were reduced to ashes. A little more than half an hour sufficed to make the work of destruction complete, and it was with difficulty that the flames could be kept from extending to the neighbouring railway station and other adjacent buildings. In fact, several railway carriages were destroyed by the fire, and other damage was done beyond the area of the Exhibition itself. The losses sustained are very large. The insurances effected amount to upwards of two million marks (100,000£), but this by no means covers the damage, which is believed to be double that amount. Moreover, the fire has consumed a host of exhibits which can never be replaced, and whose value is far from being represented by the sum for which they may have been assured. There were not many English exhibitors, but they have all lost whatever articles they had sent to Berlin, and it is believed that none of them had taken the precaution to insure their property.

#### WALTHAMSTOW HALL, SEVENOAKS.

This educational home for the daughters of missionaries of all denominations, now completed and fitted for the reception of 100 children, was opened by Mr. Samuel Morley, M.P., on Wednesday, the 17th inst.

The institution has hitherto been located in a house at Walthamstow, which, after considerable enlargement, was still found insufficient for the increasing numbers, and it was ultimately determined to erect a new building. A freehold site was purchased at Sevenoaks, consisting of about three acres. The architect of Milton Mount College, Gravesend, Mr. E. C. Robins, F.S.A., was chosen, and the present quadrangular building was erected in stages as money came in.

The building is situated in Holly Bush Lane, between the Vine Hall estate and Knole Park, on the brow of the hill overlooking the latter. It is built in the prevalent old English style, with red brick and ornamental tile facings, and tile roof-covering, the entrance doorway being of red Mansfield stone, and a many-latticed bay window rises above it two stories in height with a quaint gable roof.

It is a picturesque group of buildings, and depends for its effect upon its size and effectiveness of outline rather than upon expensive ornamentation of any kind.

The grounds are laid out for lawns, gravel walks, and playgrounds, and for kitchen gardens, and are entered by ornamental gates, presented by Mr. E. Fye-Smith, of St. Pancras Iron Foundry. The lodge is not yet erected.

The dining-hall is opposite the entrance-hall in the centre of the quadrangle, and has an open-timbered and panelled pitch-pine roof. The rest of the open quadrangle is occupied by the lavatories and cloak-rooms, carefully fitted up and heated with warm-water pipes, with which the dining-hall and all the corridors are warmed, open fires being provided for the rooms generally. The kitchen block incloses the north side of the quadrangle, and is of two stories, and has servants' dormitories on the first floor. The lofty kitchen in the centre occupies two stories. Adjoining which are the scullery larder, pantry,

bread and other stores, the housekeeper's room and store-room, and the cooking school.

The first contract for the foundations and drains was taken by Messrs. Punnett & Co., and cost 1,400*l*. The next contract for the carcass of the main building and dining-hall was taken by Messrs. Willcombe & Oakley, and cost 6,300*l*.

The same firm completed the whole building, and laid out the grounds and fenced in the land, at a cost of about 10,000*l*., included in which sum are the following fittings which were executed by other tradesmen:—The heating apparatus, stoves, ranges, and ventilators by Mr. Boyd; the school fittings by Mr. Hammer; the gasfittings by Messrs. Richardson & Ellison; the blinds by Mr. Adkins; the joiner's fittings in cupboards and linen closet, fittings and tables, and cubicle furniture, as drawers and wash-stands, &c., by Mr. Ansell; the stained glass by Messrs. Pepper; the wood-block floors by Mr. Gregory; the tile pavements by Mr. Simpson; the fire hydrants by the local water company; the lightning conductors by Messrs. Cutting, &c.

Mr. Jabez Bignell has acted as clerk of works throughout.

#### THE EDINBURGH ARCHITECTURAL ASSOCIATION.

The members of this Society, to the number of about thirty, headed by their president, Mr. John M'Lachlan, visited Hailes Quarry on Saturday, the 13th. At Kingsknowe Station they were met by Mr. Young, manager for Sir William Carmichael, who conducted them over the quarry. A fine view of the gigantic hole, the work of about 300 years, was got as the company passed round the top previous to descending. Hailes' quarry has been noted since it was opened for producing foundation stones of great strength, as well as superior steps and plates. Specimens of his finest rock were shown by Mr. Young, including a stone about 30 ft. long, 15 ft. broad, and about 18 in. thick, with beds as smooth and level as if they had been dressed by hand. The place was pointed out in the quarry where a large mass of liver rock—as distinguished from the stratified rock of the rest of the quarry—had been got. From this mass was built the front of Costes Crescent, forty or fifty years ago. The tail of the mass is still visible, looking very different from the serrated stone around. The company then proceeded under the picturesque natural arch which carries the Union Canal, and, after inspecting the eastern portion of the quarry, were entertained by Mr. Young to a collation of cake and wine. A cordial vote of thanks, accorded to Mr. Young, on the motion of the President, brought to a close a visit both enjoyable and instructive.

#### THE "SIMPLE" SCREW-DOWN COCK.

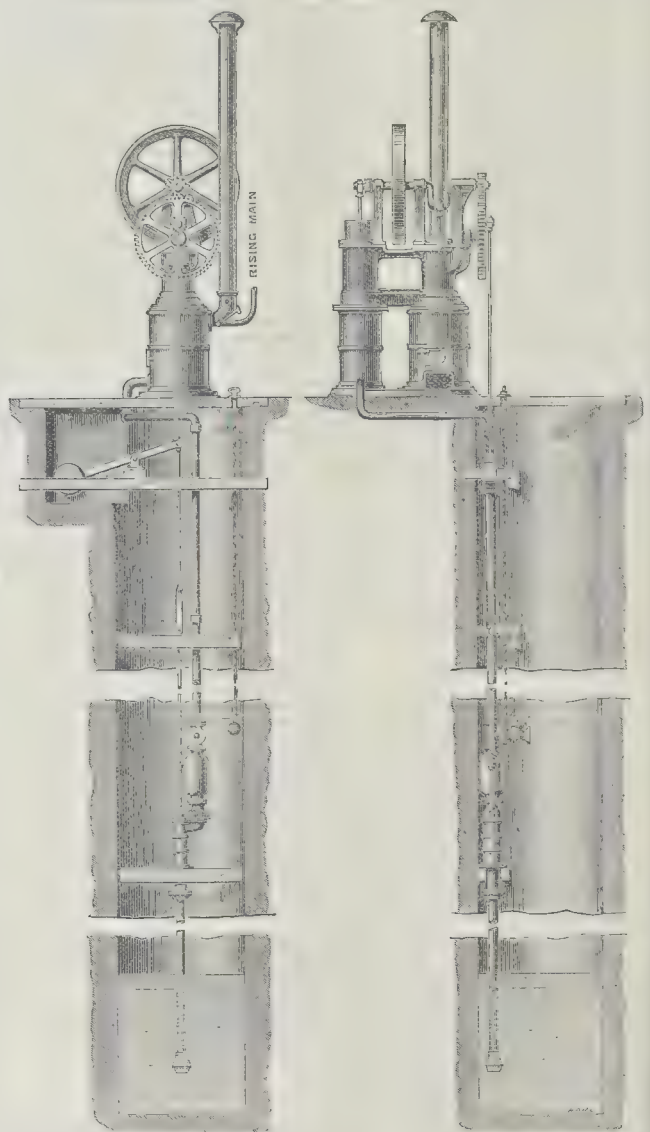
THERE was room for an improvement on the ordinary screw-down cock, and this seems to have been effected in the one advertised in our pages under the above title. It is the invention of Messrs. Ashton & Sperry, and well merits the name of "Simple." It consists only of three main parts,—the barrel, the valve, and the cap. The valve-spindle is free to work within the barrel, being raised by the pressure of the water as the cap is unscrewed and closed by the screwing down of the cap. The only difference between the hot and cold water cocks is the material of which the valve or bucket is made. For the former, vulcanised indiarubber is used, whilst for the latter the ordinary cup leather answers the purpose. In comparing this cock with the ordinary screw-down stuffing-box cock, it will be seen that it has fewer parts. The stuffing-box is entirely done away with, the action being dependent upon the water which raises the spindle, and is shut off by the spindle being pressed upon its seat. The cap is screwed on the outside of the barrel with a coarse thread, which gives a quick action, a set screw preventing the cap being raised too high. A very small quantity of water will raise the spindle, and as the pressure is increased the bucket is correspondingly expanded by the water inside it, and, no matter how great the pressure, the cock is found to remain sound; in fact, the greater the pressure the more perfect and striking is the success of this cock. The screw, being out of the water, is not liable to corrode; and no dirt can enter the working parts. The manufacturers are Messrs. John Russell & Co., of 145, Queen Victoria-street, London, Walsall, Birmingham, and Wednesbury.

#### DOMESTIC WATER SUPPLY.

Two years ago, in calling our readers' attention to the subject of domestic water-supply, we described the simple little hot-air engine of Mr. A. K. Rider, of Waldon, U.S.A., which is said to be capable of raising 1,000 gallons of water to a height of 80 ft. for the sum of 1*d*.

Messrs. Hayward Tyler & Co., hydraulic engineers (who are the sole makers of this little machine), have lately further improved its

adaptation to deep-well pumps. The accompanying illustration shows the mode of working. It will be seen that on the main shaft a pinion is fixed, gearing (4 to 1) into a wheel carried on a long stud. On the wheel is a crank-pin carrying a connecting-rod, which acts directly on the pump-rod. By thus reducing the speed to one-fourth, a single-acting lift-pump can be employed, instead of, as hitherto, the more expensive plan of driving a set of two or three throw pumps.



Since our former notice, a great many installations of the Rider household pumping-engine have been made, and we are informed that many of the engines set to work five years ago have scarcely cost a shilling in repairs. The want of a cheap, efficient, and perfectly safe motive power, which can be put into the hands of an ordinary gardener or his assistant, has been greatly felt for many years. The number of these engines now in use all over the country seems to show that Mr. A. K. Rider has provided what was needed. One of these engines has been in operation for the last four years at the office of Mr. Oke, C.E., 39, Queen Victoria-street, where it may be seen doing actual work, any day (excepting Saturday).

The cheapening of the deep-well pumping apparatus is a step in the right direction, while the reputation of the makers is a sufficient guarantee of success.



## BUILDING PATENTS.\*

APPLICATIONS FOR LETTERS PATENT.

- 2,116. A. W. Kershaw, Lancaster. Ventilators. May 5, 1882.  
 2,120. W. McGill, Lambeth. Urinals. May 5, 1882.  
 2,121. T. W. Helliwell, Brighton. Water-closet basins, &c. May 5, 1882.  
 2,150. A. Sweet, London. Self-closing valves for closets, &c. May 6, 1882.  
 2,157. J. M. Gray, Kingston-upon-Hull. Composition for cleaning and whitening stone stairs, hearthstones, &c. May 8, 1882.  
 2,179. A. Foster, Watford. Apparatus for cleaning windows. May 9, 1882.  
 2,216. T. C. Summers, Portsea. Supply of water to water-closets, &c. May 11, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named.

May 9, 1882.

33. S. L. Hunt, London. Street-cleaning and sweeping apparatus. Jan. 3, 1882.  
 42. E. G. Lakeman, Modbury. Stoves and furnaces. Jan. 4, 1882.  
 76. J. H. Johnson, London. Domestic fire-places or stoves. (Com. by M. Perret, Paris.) Jan. 6, 1882.  
 77. H. Reid, London. Machinery for moulding, &c., cement for paving, building, &c. Jan. 6, 1882.

May 12, 1882.

- 1,620. P. M. Justice, London. Plaster for coating of walls, &c. (Com. by M. B. Church, Grand Rapids, U.S.A.) April 4, 1882.

## ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending May 13, 1882.

- 3,778. W. Leggett, Bradford. Actuating and opening window sashes.

A toothed rack is secured on each side of both of the sashes. These slide in guides secured to the pulley-stile. At the bottom of each rack is a socket for the sash-lifting bar, which is secured to the bottom stile of the sash. Gearing is fitted to the racks, and the sashes may be raised or lowered as required, and by releasing the top of the sash from the rack the outside can be turned into the room. Aug. 30, 1881. Price 6d.

- 4,188. G. Hutton, Southport. Outside Spanish sun-blinds.

The blind is secured at the top to a roller actuated by one cord, and the bottom of the blind is secured to a falling frame, which forms the bonnet. The blind passes between rollers, and then projects out to this falling frame, to which wings are provided. The roller and the falling frame travel in slides. Sept. 29, 1881. Price 6d.

- 4,191. G. J. Cox, Maidstone. Gas cooking and heating stoves.

This is an improvement on Patent No. 2,636 of 1881 in various points of detail, which are described in thirteen pages of specifications, stated in nine claims, and shown in forty figures in the drawings, but which are not capable of being condensed. Sept. 29, 1881. Price 8d.

- 4,300. F. des Vœux, London. Manufacture of pipes for conveying water, gas, &c.

These are made of smooth sheet metal rolled into volute or cylindrical form, and layers of asphalt or cement, &c., are placed inside, and, if necessary, outside of the metal also. (Com. by M. Marx, New York, U.S.A.) Oct. 4, 1881. Price 8d.

- 4,367. S. E. Simpson, Birmingham. Dwelling-houses, &c.

These houses are placed back to back. (Protection not allowed.) Oct. 7, 1881. Price 2d.

- 4,376. J. Carter, Uxbridge. Constructing and glazing roofs, &c.

The purins are attached to the principals by thumb screws. The panes of glass are arranged in rows, and the upper edges enter a groove in the side of the purin, while the lower edges rest on the top of the next purin, where they are secured by screw-hooks. Under the lower edge is a channel to receive the inside condensation. (Pro. Pro.) Oct. 8, 1881. Price 2d.

- 4,393. C. Shields, Manchester. Construction of safety-valves for domestic boilers, &c.

The casing is of globular form, and inside is a copper ball, provided at its upper side with a small valve and piston working against a seating in the lower side of a spring piston which is placed in a neck on the top of the casing. When the water falls below the level of the safety-valve the ball falls and opens the small valve for the escape of air or steam, and when the water rises too high the ball will raise the spring piston and allow the water to escape. Oct. 10, 1881. Price 6d.

**Artists' General Benevolent Institution.**—The sixty-seventh annual dinner of this Institution was held at Willie's Rooms on Saturday last, Professor Huxley, F.R.S., in the chair. Subscriptions to the large amount of 3,342l. were announced.

\*Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

## CASES UNDER THE EMPLOYERS' LIABILITY ACT.

GRIFFITHS V. THE EARL OF DUDLEY.

A VERY important decision was given on Tuesday last in an action in which the widow of an undersinker named Griffiths sued the Earl of Dudley for 150l., the estimated amount of three years' earnings by her husband.

Shortly stated the circumstances of the case are these:—The deceased was at work, with a master-sinker named Gould, in making "manholes," or places of refuge, in the pumping-shaft of Lord Dudley's No. 2 pits, Himley Colliery, on the 19th of November last. They had fired a shot for the purpose of an excavation and had given the signal to ascend to the pit bank, when, at the critical moment, the indicator of the engine failed to act, and the men were drawn up close to the pulley, but not over it. Gould, the head sinker, clung to the pit frame and was saved; the deceased, in an effort for life, tried to jump from the "howk" to the pit's bank, in essaying which he fell down the shaft and was killed. The case came before Sir Rupert Kettle, at the Dudley County Court, on March 24th last, when it was urged on the part of Lord Dudley that the deceased had accepted the "conditions of employment" in force at his lordship's collieries, and had thus contracted himself out of the Act.

Sir Rupert Kettle, who reserved his decision at the time in view of the importance of the case, now delivered judgment. He awarded the widow the full amount claimed, as he held (according to the summary of the case published in the "Times") that no man has a right or legal power to bind his representatives by contracting himself out of the Act. The learned judge agreed to stay execution, pending a probable appeal to a higher court.

## HEAVEN V. FENDER.

ANOTHER important action was tried at the Bow County-court, on Friday, May 12. The plaintiff, F. A. Heaven, sought to recover from the defendant, Mr. Fender, of the West India Docks, the sum of 100l. as compensation for injury sustained by him while engaged on the defendant's premises.

It appeared from the evidence that a Mr. Gray undertook to paint the steamship *Benalder* for Messrs. Thompson, of Leith, and the defendant Fender contracted to construct the scaffolding necessary for painting the outside of the vessel. On April 3, 1881, the plaintiff was engaged by Gray in painting the ship, when suddenly a rope supporting the scaffold broke, the scaffolding gave way, and the plaintiff fell a distance of from 17 ft. to 20 ft., and sustained injuries to his arm, leg, and side. He was under medical treatment at the hospital for four weeks, during which time he was unable to work. After this time, however, he was able to resume his duties, but experienced pains in his back while doing heavy work. It was contended on behalf of the plaintiff that the scaffolding was improperly constructed, and was not capable of supporting the workmen employed in painting the ship; also that the scaffolding should have been so constructed as to be capable of supporting not only the workmen but the public passing to and fro as necessity required.

On the other hand it was contended that the scaffolding was not improperly constructed; that the ropes were examined prior to their being used, and that no defect whatever was found in them; also that the accident must have occurred through the rope being injured in some way after it was put into use. It was further contended that the plaintiff was employed by Gray, and not by the defendant; also that the defendant was not bound by his contract to erect scaffolding capable of supporting the public, but only the workmen employed upon the ship.

The Judge, however, decided in favour of the plaintiff; damages, 20l. and costs.

Notice of appeal was given.

Mr. Scott appeared for the plaintiff, and Mr. Dickens for the defendant.

## BAD DRAINAGE: LIABILITIES OF HOUSE-OWNERS.

NEVILL V. SMITH.

THIS case was decided in the City of London Court last week by Mr. Commissioner Kerr. The case had been before the Court some weeks previously, the action being to recover 50l. damages for loss and injury sustained through the alleged defective state of the drainage of a dwelling-house.

The question at issue was whether a landlord was bound by the representation of his agent. Mr. Float, the agent, was examined by Mr. Wetherfield, on the part of the plaintiff, and stated that he always let defendant's houses and received the rents. He remembered having a conversation with the plaintiff before the agreement for the house in question was signed. He did not remember whether anything

was said by him as to the sanitary condition of the house, but if the question had been asked he certainly must have replied that it was thoroughly well drained and in a perfect sanitary state.

His Honour.—You say if you had been asked whether the house was well drained and in a perfect sanitary condition you would have said it was; but had you the smallest authority for that?

Witness.—Well, I knew more about the house than Mr. Smith did.

His Honour.—Did he leave the letting entirely to you?

Witness.—Entirely.

The plaintiff was called, and stated that he was a clerk in the City. He was very particular about the drains, because he had young children, and it was Mr. Float's representations which induced him to take the house. He was distinctly told that the drains had been thoroughly overhauled and the joints looked to, and that they were all in perfect sanitary order. Not long after he entered into occupation of the house, however, serious illness broke out in his family, which was attributable solely to the state of the drainage, and hence the present proceedings.

Mr. W. Beresford Smith, the defendant, deposed that he carried on business in Lombard-street, Gracechurch-street. He did not give Mr. Float any authority to make any representation as to the house.

His Honour, after a legal argument, said he was bound to find on the evidence—first, that inquiries as to the sanitary condition of the dwelling were made by the plaintiff; secondly, that Mr. Float had authority from the defendant, because it would be a mockery to say that a man should have everything to do with the letting of a house without seeing whether it was healthy or unhealthy; and, thirdly, that the plaintiff relied upon such representations as were made by Mr. Float. On the point of law, therefore, he was in favour of the plaintiff's case; but as to whether the house was in a sanitary state or not, that was a question for experts, and he referred it to the arbitration of Dr. Murphy, medical officer for St. Pancras. That gentleman accordingly examined a number of witnesses in the Judge's private room, and after fully considering the evidence, and examining the premises, he has come to the conclusion that the drainage was defective, and that the illness in the plaintiff's family arose from sewer poisoning.

Judgment has accordingly been entered by arrangement for the plaintiff,—damages, 35l.

## MASTERS AND MEN.

**Oldham Painters.**—On the 12th inst. a meeting of operative painters was held at Oldham on the subject of an advance of 4d. per hour in their wages. They hold that the employers agreed last year at the close of the strike to give 4d. advance, which has been conceded in Ashton. The fact of the advance not being given by the Manchester employers has been taken by the Oldham employers as a reason why it should not be granted.

**Pettington Slate Trade.**—Matters in the Pettington slate-quarrying district continue unsettled, owing to the committee having so far failed to come to any arrangement with the employers as to the movement for shorter hours of labour. The committee intend laying the question before the annual conference of the North Wales Quarrymen's Union, which will shortly be held at Carnarvon. Generally the trade keeps brisk, although there are complaints of accumulation of stocks at some quarries.

## DUTCH HOUSE BUILDING.

ALLOW me to correct a statement in your issue of May 6th, quoted from the *Gardener's Magazine*.

1. The land is *not* sand, i.e., in the parts to which that article refers, but rich alluvial mud. The only very small strip of sand in Amsterdam is that on which the so-called "Old Church" is built, which stands in close contiguity to the "Bible" Hotel.

2. The King's Palace is not built upon 70,000 piles, but upon 13,659 piles.

3. It is not built of marble, but of Bentheim freestone, except the bottom part, which is of brick.

4. Some of the houses, especially those leaning over towards the street, are purposely so built, the principal reason for which appears to have been that the window-glass should be less easily dirtied by the falling rain.

5. The principal pumping stations are worked by steam power. The secondary canals and ditches are drained by windmills.

With these few corrections the article leaves nothing to be desired, though perhaps we might query the statement so boldly made that the people enjoy good health. F. B. SIMONS.



## EDINBURGH.

STR.—In your number of May 13th, in your notes from Edinburgh, you mention dry rot having occurred in the timbers of the Royal Infirmary. May we ask you to also call attention to the fact of the lifts originally put up never having worked at all, and that our estimate has been accepted for taking down the old lifts, and erecting high-pressure, direct-acting ram-lifts, without weights or chains? We are well on with the work, and shall have them all completed by the end of next November. The amount of our tender was between 3,000l. and 4,000l.; boring extra. We may state that this kind of lift is a new patent (Stevens and Major's patent), and that we are the sole manufacturers of it. It has the distinct advantages of having no chains to break, nor any pulleys or gearing overhead, and is practically absolutely safe.

May we also ask you to give us credit for supplying and putting up all the lifts at the Edinburgh New University Buildings, and to state that all the windows are fitted with our patent weathertight "Janus" casement-fastenings and kill-bars?

ARCHD. SMITH & STEVENS.

## THE RECENT VIOLENT STORM.

STR.—May I ask you to mention a curious circumstance which came under my notice soon after the tremendous storm which took place on Saturday, the 29th of April last? On the glass of some of the windows of the house in which I reside, I perceived a very singular appearance, somewhat resembling a deposit from milk. On looking at it through a microscope, I discovered a number of very beautiful crystals, which, without doubt, were caused by the spray from the sea, as, on applying it to the tongue, there was a strong taste of salt. The distance the spray must have been carried on this occasion could not have been less than sixty miles, taking into consideration the course of the wind, which was south-west.

Waddon, Surrey.

NATHANIEL WATERALL.

## VOLUNTARY v. COMPULSORY SANITARY INSPECTION.

At a meeting recently held in Glasgow to promote the establishment of a house-holders' sanitary protection association, Mr. John Honeyman, architect, in supporting a resolution, said he thought he might venture to say on behalf of his professional brethren, as well as on his own behalf, that they did not regard the formation of such associations with jealous or unfriendly feelings, but rather as powerful auxiliaries in promoting much-needed sanitary reforms. For his own part, knowing practically the difficulties which often lie in the way of proper arrangements being devised for house drainage, and the dangers which arise from bad workmanship and from accidental causes before and after a house was occupied, he thought it was simply impossible to over-estimate the importance of periodical inspection. He was quite certain that if every householder in Glasgow knew as well as he did how impossible it was to rely upon the sanitary arrangements of a house being faultless at first, or continuing to be so, the prospectus of the proposed association would not be many days published till its membership would be reckoned by thousands. A hope had been expressed that the operations of such associations would lead up to the establishment of compulsory inspection by Government or local authorities; but he sincerely hoped that they would have no such result, and that they would rather do away with any excuse for such official interference. He was a believer in a doctrine which seemed to be getting rather out of favour of late, that the worst thing you could do for a man—the surest way to debase him, and to make him worse in every respect—is to do for him what he is perfectly able to do for himself, especially when it is clearly his duty to do it. Surely it would be infinitely better to aim at arousing an intelligent interest in such a subject as this, so much affecting one's own well-being and that of those nearest and dearest to him, and to stimulate to manly, independent action. Undoubtedly one of the most important results of the establishment of such associations would be their educative influence. This would very speedily be felt. Architects who might not have given the subject so much study as it deserved—and he feared there were such—would see the expediency of guarding against errors which the first visit of the inspector of the association would disclose. Contractors would certainly become more careful to avoid defective work, while householders would find themselves wonderfully enlightened

after perusing the inspector's first report; and this increased knowledge would certainly produce most important results.

## Books.

*Joints made and used by Builders.* A practical Treatise. By W. J. CHRISTY. Illustrated. London: Crosby Lockwood & Co. 1882.

MR. CHRISTY'S little treatise on joints forms one of Weale's *Rudimentary and Scientific Series*. The idea of the writer has been to bring together in a form capable of easy reference accounts of the various joints made by the artificers of certain specified trades. Those selected are (1) joints used in drainage, (2) bricklayers' joints, (3) masons' joints, (4) tilers' joints, (5) slaters' joints, (6) carpenters' joints, (7) smiths' joints, (8) joiners' joints, (9) plasterers' joints, (10) plumbers' joints, (11) zincworkers' joints, (12) copper-smiths' joints, (13) glaziers' joints, (14) gasfitters' joints, (15) paper-hangers' joints, (16) paviors' joints. In a work consisting almost exclusively of detail a reviewer will scarcely take upon himself to say that the subject has been either exhaustively or faultlessly treated, but as far as we have been able to trace the steps of Mr. Christy we think that he has fairly and distinctly brought before his readers intelligible accounts of the large number of joints that he describes. It is, perhaps, to be regretted that the inquiry has been limited to the term 'used by builders.' A little additional research would have gone far to make his book a comprehensive glossary of the various modes of joining materials now in common use. Thus we have distinctly enumerated the joints of the plumber, the zincworker, and the copper-smith. It would have been more comprehensive to arrange a section of joints made by workers in metal, and to treat of welding or autogenous joinings; soldering, or quasi-autogenous joinings; and joinings made by bolts or rivets. Again, we cannot but think that with reference to what, according to common parlance, is the typical joint, namely, the hinge, we ought to find something more than the short paragraph headed "Hinge Joint" among joiners' joints. "The whole subject," says Mr. Christy, "of hinging is so enticing and interesting that it will be expedient to pass on at once to the next joint." Here the author does scanty justice, either to himself or to his subject. On p. 173 he figures a "rule joint," which he calls "a hinged or movable joint given sometimes to window-shutters, but most commonly seen in tables, and other productions of the cabinet-maker." This avoidance of a most important branch of the subject leads to the remark that Mr. Christy has nowhere stated what he considers to be the true technical meaning of the word "joint." It has, no doubt, a double sense,—as implying either the actual point of junction of two substances, or the mode or principles of junction. And of the two, it is the latter which has the most significance, and the explanation of which is of most value to the pupil. "By a simple joint," we are told, "is meant one consisting of nothing beyond the contact of meeting surfaces,—such as an abutting joint in carpentry,—without fastenings of any kind." We demur to calling such an accident a joint at all. The idea of holding together, not that of mere juxtaposition, we take to be a necessary element of the meaning of the word. "By a compound joint is meant one in which a cementing medium, or some kind of attachment, is used to assist weight or pressure in keeping the contiguous parts from moving or rattling." We should like to see either literary or technical authority cited for the last sentence. As it stands, it excludes that large and most important category of connexions which allow of free play in a definite, or, as in the case of the "universal joint," "in any direction with certain restrictions as to extent." The explanation of a compound joint which excludes either the hinge or the universal joint is singularly unhappy. Nor does the reference on p. 4 to the haunch of venison at all tend to render more clear to the reader the true meaning of the little word "joint."

A treatise on the subject, then, should commence by defining the sense which the author attributes to the word used on his title-page, and should then lay down the principles which underlie the several species of joints. Thus, the reader would commence with the general but definite idea of what was required, and of the method by which it was

sought, according to the nature of the different materials employed, to ensure the given end. These ends, moreover, would be of at least two sorts, according as it was desired to obtain a movable joint, or a substantial union of two materials. As to this, however, Mr. Christy tells us nothing. What he has produced thus far is rather a glossary than a treatise. As a glossary the work is deserving of high commendation. And it has the rare excellence of a full, not to say elaborate, index.

## VARIORUM.

"THE Iron Duke, or the Monument Removed," by V. I. H. (Marcus Ward, Chandos-street), serves to show the opinion entertained out of doors respecting our municipal authorities. It is a good-humoured skit, and we reprint the close of it:—

"The deed was done. The Wellington Arch, much to its own surprise, had disappeared from the face of the earth, and the statue was no longer visible to the public eye. Grosvenor-place and Hyde Park-corner were considerably wider than heretofore, but most of the traffic,—that is, all that survived the ordeal of the block by Hamilton's place,—chose to go down the new road to Halkin-street, the extra width was hardly required. The Board of Muddles, economically inclined, soon came to the conclusion that the cost of keeping the wood-pavement in repair was too enormous to be defrayed: so a large piece was taken from it and thrown into the triangular garden, which covered the space vacated by the arch. Here, however, arose a new difficulty. The cost of keeping up the garden being now greatly augmented, it was proposed to erect some centre monument to cover part of the cultivatable area.

"Bless me!" thought each individual member of the Board, but none had the generosity to say so, "the old Arch would have done as well as anything else if we had left it standing."

This, it may be remembered, had been the Arch's own opinion many years before.

"Suppose," said one of the members, cautiously approaching the subject by setting forth a proposition somewhat akin to the one in his own and his colleagues' minds,—suppose we put up Temple Bar?"

The idea recommending itself, application was made to the treasurer, who, unfortunately, quashed the movement by looking in the company's coffers and only finding a bad farthing, which, by the way, happened to be owing.

Let us now return to our friends the Arch-Duke and the Dusal-Arch, who were becoming very uncomfortable in their cramped position in a stone-mason's yard. He had kindly taken them in when no one else seemed to know what to do with them; but even he was getting tired of so hospitably entertaining such unremunerative guests, and daily and hourly he became more abusive and insolent. Frequently he might be overheard grumbling at the space they occupied. Alas! even their wretched standing-room was grudged them; and, had he not been too heavy to move without great expense, the Duke would undoubtedly have been packed at the top of the dismembered Arch to get him conveniently out of the way. What was to become of them?

Things were at this deadlock (everything was at a deadlock, not only the vehicles at the bottom of Hamilton-place), when a way out of the pecuniary difficulty providentially presented itself.

A gentleman, with a remarkably nasal twang, made a bid for the Arch.

His offer was received with indignation and contempt, and forthwith accepted. So he built a big ship, and sailed away with his latest trophy, several City dignitaries accompanying it on its first stage to see it safely off.

The Arch now occupies a somewhat subordinate position as a strange gateway for the abode of a certain magnificent animal (exact species now extinct, though some very small specimens of similar quadrupeds may still be seen in the Regent's Park), and, from a little distance, Cleopatra's American needle looks down contemptuously upon it.

Before leaving the Transatlantic resting-place of our second hero, we may add that it is proposed to finish the domestic group by buying and bringing over the Tower of London to match the obelisk.

The old Duke meanwhile,—nobody having bid for him,—was banded about from pillar to post, and finally carted off to the Embankment, where, instead of the homely sparrow sitting on the bridge of his aquiline nose, the grimy street Arab sits on the saddle of his charge, and, in a few defiant, his faithful steed from the onslaughts of these marauders; much less can he, by his warlike appearance, awe,—as was confidently and economically expected by the police,—the banditti who make night hideous with their wholesale massacres on the banks of the Thames.

There he sits in stony grief, while from a little distance Cleopatra's English Needle looks down contemptuously upon him.

Let us draw a curtain over the harrowing picture. See, the walkers are unfurling their umbrellas, and



another passing shower may be expected, if we can judge by the look in the eyes of the old Iron Duke.

—"An Elementary Treatise on the Construction of Roofs of Wood and Iron," by E. Wyndham Tarn, M.A., architect, has been added to Weale's "Ridimentary Series" (Crosby Lockwood & Co.), and will be found valuable by all students. It is intended as an introduction to more elaborate treatises upon this important part of a building, but Mr. Wyndham Tarn is so thoroughly master of his subject that, although the treatise is founded on the works of others, he has given it a distinct value of its own.—"William Hedley, the Inventor of Railway Locomotion on the present Principle" (Carr, Newcastle-on-Tyne) is an endeavour by Mr. Archer to obtain for Hedley the credit that has been denied him. The world will call George Stephenson the inventor of the locomotive, and the work done by Hedley, who first discovered the grand fact that the wheel of the engine upon the smooth line was sufficient to give the amount of propulsion to enable it to move and carry weights is always forgotten. It is right that Hedley's claims should be insisted on, so we commend Mr. Archer.

### Miscellaneous.

**Statue to a former Lord Mayor of London.**—The *Coventry Herald* has published a sketch of the marble statue which it is intended to erect on Grey Friars-green in that town as a memorial to Sir Thomas Wyatt, who, born at Reading in 1492, the son of a poor clothier, was apprenticed to a London merchant when only twelve years of age. In 1523 he embarked in business on his own account, his father having left him 100*l.* to begin the world with, and by thrift and industry he succeeded so well that he acquired a large fortune, whilst at the same time, and subsequently, he took great interest in the municipal government of the City of London. In 1546 he was elected sheriff, and became Lord Mayor in 1553. It was during his term of office that the insurrection under Sir Thomas Wyatt took place, and the effective measures which the Lord Mayor caused to be taken in suppressing it obtained for him the recognition of knighthood at the hands of Queen Mary. Although constantly occupied in the exercise either of business engagements or municipal affairs, he still found time for interesting himself largely in benevolent actions, and his powers were equal to his will. In 1542 he gave 1,000*l.* to the city of Coventry to purchase lands, which he appears to have shortly afterwards augmented by 400*l.* more, and this sum of 1,400*l.* he subsequently enlarged to 2,060*l.* The rents of this land were to be applied in the exercise of charity. In 1553 Sir Thomas Wyatt founded the College of St. John's, Oxford. Bristol, Northampton, Leicester, Nottingham, Warwick, Shrewsbury, Gloucester, and fifteen other places, have good cause to reverence his memory, and the town of Leicester has set an example by erecting a memorial clock-tower in its market-place at a cost of over 1,000*l.* Coventry, which obtained the lion's share of the benefactions, has hitherto erected no memorial. The statue about to be erected there is being executed by Messrs. W. & T. Wills.

**Gas Exhibition at Newcastle-under-Lyme.**—Under arrangements made by the Newcastle Corporation Gasworks Committee and their officials, an exhibition of improved appliances for the use of gas was opened last week in the Town-hall. The exhibition showed the progress which had been made of late in the utilisation of gas for other purposes than that of lighting, and though, from the limited space at disposal, it was not of an extensive character, the exhibition was most interesting, especially as it was the first of the kind held in the district. The committee were fortunate in securing the co-operation of a number of manufacturers of gas apparatus, and an appropriate introduction to the exhibits was shown in a neatly-made model of a gasworks, kindly lent by Mr. C. Hunt, of the Corporation Gasworks, Birmingham. From this exposition of the manufacturing department, the visitor passed on to a very striking display of the products which science has taught us may be derived from coal.

**The Dorking Local Board,** at their meeting on the 9th inst., appointed Messrs. Smith & Austin, of Hertford, consulting engineers to the Sanitary Authority, to carry out works of sewerage for their district.

**Memorials of the Dead.**—The inaugural meeting of the National Society for Preserving the Memorials of the Dead was held last week at the house of the Society of Arts, Adelphi. In the absence of the Earl of Carnarvon, Mr. S. Leighton, M.P., presided over the earlier portion of the meeting. The objects of the Society are to preserve and protect the memorials of the dead in the parish churches and churchyards: By securing a record of sepulchral memorials now existing being made, and a notification of the site of destroyed or removed monuments, where such can be identified; by a careful watching of work carried on in the churches and churchyards, especially during the period of "restoration" or rebuilding; by repairing and renewing any such memorials as the society may be advised, and, if necessary, under faculty; by granting funds for the purpose, where no branch of the family remains; by using every legitimate means to prevent the desecration of the churchyards; by promoting and procuring legislation; by promoting a publication (illustrated if possible) of the more important and historical examples, and by encouraging the printing and publishing of parochial registers; by forming a reference library of works treating upon the monumental and art sculpture of the country. Mr. A. E. Street, M.A. has consented to act as the honorary architect, and Mr. R. Davison as the honorary monumental conservator. The Bishop of Nottingham moved:—"That the memorials of the dead in our parish churches and churchyards, being a part of the records of our national life, are well deserving of being preserved from decay, destruction, and loss." Major Heales seconded the motion, which was carried. The Earl of Carnarvon, having subsequently arrived, took the chair, and warmly commended the society to the support of the meeting. His lordship mentioned many places in which tombstones and monumental brasses were being ruthlessly destroyed. In some villages gravestones had been used to pave cellars and cottages, and even with the permission of the clergymen themselves. He regarded churchyards with the greatest veneration, and showed how beautiful many of them were nowadays when contrasted with those which had been allowed to go into decay.

**St. John's School Extension, Ealing Dean.**—These new schools have been built and completed within a period of about five months by Mr. Dorey, contractor, of Brentford, from the designs of the architect, Mr. Robert Willey, Lodge-st. Hill. The additions are Gothic in character, to harmonise in certain respects with the existing school, and they are carried out in brickwork with stone dressings. The building is of two stories, accommodation being provided in the school and class-room on the first floor for 168 girls, and on the ground story is similar accommodation for 168 boys, the principal rooms being each 62 ft. long by 20 ft. wide. The infants are to retain the old school, which will accommodate 160. Special attention has been given to the heating and ventilating arrangements, Manchester grates having been adopted, and numerous and easily controlled air inlets and outlets having been provided in all the rooms. Bowes Scott and Read's automatic flushing tank has been adopted for the closets. The contract for the works was 1,150*l.*, which was exclusive of fittings and fixtures.

**Forth Bridge Railway Bill.**—This Bill has been passed by a Select Committee of the House of Commons, of which Colonel Stanley is chairman. The promoters of the Bill are the Great Northern, North-Eastern, Midland, and North British Railway Companies. The object of the Bill is to construct a bridge across the Forth at Queen's Ferry. The bridge is to be about one mile in length, and is to be on the girder principle. There are to be two main spans of 1,700 feet in length. The roadway of the bridge will be 150 feet, which extends in each span for 500 feet. The Board of Trade require that the bridge shall bear a wind-pressure of 56 lb. to the foot, and a strain of one ton to the foot. The material to be used in the construction is steel, of which it was stated 43,000 tons are to be used. The cost of the bridge is to be 1,750,000*l.*, and the engineers are Messrs. Barlow, Fowler, & Harrison.

**Hertford Sewage.**—The Corporation of Hertford have agreed with the Rivers Purification Association, of 232, Gresham House, Old Broad-street, to continue the purification of the sewage of the town for a further period of five years at an increased subsidy.

**New Altar, Mayfield.**—The new altar in the Church of the Convent of the Sisters of the Holy Child Jesus at Mayfield is now nearly completed. The design of the altar (says the *Sussex Advertiser*) is by Mr. Pugin, jun. The sculptures were executed by Mr. Boulton, of Cheltenham; and the brasswork by Mr. Hardman, of Birmingham. The centrepiece consists of a burnished corona (suspended at present from a temporary crane) supported by two angels. From the corona descends, in effective folds, a veil in sculptured stone, sheltering a tabernacle of burnished brass placed just above the altar. On either side are sculptures, the one on the right representing St. Thomas of Canterbury in the act of refusing to sign the constitutions of Clarendon; the other, on the left, showing St. Dunstan drawing, with a pair of compasses in his hand, while a band of angels appear to him. At either corner stands a high sculptured figure; on the right, St. Joseph, holding the Child Jesus; on the left, the Virgin. Under the altar is an alto-relievo sculpture, representing the Child Jesus lying in the crib at Bethlehem, with St. Joseph worshipping at one end and the Virgin at the other, some charming angel faces appearing in the background. The chapel, it may be known, occupies what used to be the banqueting-room of the archiepiscopal palace, and the altar stands where the archbishops' throne used to be. The building has been restored as nearly as possible, according to its original design, Mr. Pugin objecting to the removal of the ivy-covered ruins, which he used as a beginning for his own modern work. The furnace adjoining the chapel is shortly to be removed. Other restorations are contemplated. Among other things, it has been decided to construct cloisters.

**The International Colonial and General Export Trade Exhibition** is to be held at Amsterdam next year, from May to October. The general regulations provide that the Exhibition shall contain (1) produce of the Colonies; (2) articles of general export; and (3) works of art and antiquity. It will provide opportunities for competitive exhibitions of living animals, flowers, fruits, &c.; and also for the holding of congresses and conferences. The prizes are to be awarded by an International Jury. The juries will be formed into sections corresponding to the groups and classes of the Exhibition. The rewards are to consist of (1) a diploma of honour, (2) a gold medal, (3) a silver medal, (4) a bronze medal, and (5) honourable mention. Every diploma and medal will be accompanied by an official medal in bronze. The articles exhibited will be arranged for each nation into nine groups for the two first divisions. Every group will be divided into classes, following the system of the general classification. There will be published, in the Dutch and French languages, an official catalogue, setting forth the productions of each nation and the name of each exhibitor. All communications, whether from exhibitors or other parties interested, should be addressed to Monsieur le Commissaire Général de l'Exposition de 1883 à Amsterdam.

**Strawberry Hill in the Hands of the Philistines.**—The thought is torture (says the *Richmond and Twickenham Times*), but the fact may be possible, judging from the story which has gone the round of the Press, without contradiction, that the house is being transferred to the Americans for hotel purposes. "It seems impossible to believe that those who have the power to sell should have so forgotten the chivalry of noble associations and the social glories of the last few years (hallowed by the shadow of death), that all should have been outweighed by the potent consideration of the base almighty dollar. Has it come to this, that great wealth and great taste are incompatible in the same person, and, given a house steeped in literary, artistic, and social memories of the most exquisite order, that when it comes into the market no Englishman of opulence and culture can be found ready to secure the noble honour of making such a glorious gem his own?"

**Birmingham.**—The opening of the restored Central Free Libraries has been fixed for Thursday, the 1st of June. The Right Hon. John Bright has acceded to the request of the committee to deliver an address on the occasion. In order that every subscriber to the Restoration Fund, as well as the members of the Council and its officers, and the representatives of the chief Educational Institutions of Birmingham, may have the opportunity of being present, it has been arranged that this address shall be delivered in the Town-hall.



**Scandalous Workhouse "Accommodation."**—At the meeting of the Guardians of the Holborn Union, on the 10th inst., a letter was read from the Local Government Board, transmitting for the consideration of the guardians an extract from a report made by Major Jordon, assistant inspector, after his inspection of the workhouse in Gray's Inn-road. The letter also referred for the second time to the report made by Mr. Hedley after visiting the workhouse on January 10th last, an extract from which was forwarded to the Board on the 24th of that month. In consequence of the serious state of things disclosed by these reports,—the absolute insufficiency of the accommodation at present at the disposal of the guardians for the relief of the indoor poor of the Union,—the Local Government Board urges the guardians to take remedial measures. The letter concludes as follows:—"The question is one of such primary importance that the Board must request that its consideration may no longer be deferred, and that they may be informed at an early date of the measures which guardians are prepared to take in the matter." The extract alluded to is as follows:—

"The men's day or cakum-picking room has to contain 220, it is ill-ventilated, a basement-room but 8 ft. in height, which allows only 8 cubic feet of space per man, consequently the atmosphere from want of air and light is almost intolerable. In the men's sleeping wards the beds are touching, and the centre space, which ought to be clear, is also occupied. The men's receiving ward is not worthy of the name, below ground, dark, and badly ventilated, and yet as many as forty admittances are passed through it in a day. The women's portion of the house is less crowded than the men's. From the cramped state of the premises there is but one yard for the female inmates, including insane. Except division of sexes, classification is impossible."

Mr. Chapman moved that the whole subject be referred to the consideration of the General Purposes Committee, which was agreed to.

**London and Middlesex Archaeological Society.**—A special general meeting of this Society was held at Hammersmith Church, on the 6th inst., when its architectural features were described by Mr. Hugh Roumieu Gough. The members then proceeded to Chiswick Church, where the rector, the Rev. W. L. Dale, gave a short account of its history, and Mr. W. S. Kershaw, F.S.A. (one of the hon. secs.), read a paper on "Hogarth and London Topography." The company then inspected Hogarth House and Fairfax House. At the last monthly meeting of the Society for the present session, held on Monday evening last, a paper on "The Church of St. Alphage, London-wall," was read by Mr. G. B. Hall. Reference was made to the old St. Alphage Church, which stood at the corner of Cripple-gate-buildings, its demolition, and the present church, then called the Chapel of St. Mary Elyng Spittle, being erected. Allusion was also made to the bonfires and bell-ringing on certain holidays, the celebration of British victories, &c., to the Plague of London, the old Roman wall, and the litigation by which it was decided to belong to the inner parishes, whilst those outside could only claim the ditch. Mr. G. Lambert, F.S.A., followed with a short communication on "Sir Nicholas Criepe, buried in Hammersmith Church."

**A Subway from the New Law Courts.**—In the House of Commons, Mr. Mellor asked the First Commissioner of Works whether the original plans for the New Law Courts did not show a communication between the Temple and the Courts by means of a subway; whether his attention had been called to the great difficulty of crossing Fleet-street, owing to the amount of traffic opposite the Temple; and whether he was disposed to afford facilities to enable such a communication to be made. Mr. Shaw-Lefevre said he believed that such a proposal had been made, but that it was not entertained by the Government of that day. No doubt such a subway would prove a great convenience, and he would be quite prepared to entertain any proposal of the kind, if made by a responsible body, but he could not hold out any hope that the Government would incur the expense.

**Inland Transport.**—Great interest is being aroused in the manufacturing districts as to the re-opening of our canals, and a petition, drawn up with a view to render the committee moved for by Mr. Salt an efficient and impartial tribunal of investigation, has received numerous subscriptions at Manchester, at Wolverhampton, and from the Chairmen of the Chambers of Commerce throughout the country.

**Proposed School of Dramatic Art.**—On Monday last the Earl of Wharncliffe presided over a meeting which was held at the Lyceum Theatre for the purpose of hearing the details of the proposed School of Dramatic Art. The noble chairman, in opening the proceedings, regretted the absence of the Earl of Lytton, owing to the death of his mother. In the project they had in view the great object was to enlist as much as possible general support. The committee comprised the names of the principal actors of the London theatres, dramatic authors, and also critics. The proposed school would teach dancing, music, fencing, stage deportment, and elocution. Above all, the principal thing would be acting. They wanted the school to be self-supporting, and did not wish to come to the State for any aid, hoping that the fees from the pupils would amply repay them. They hoped to increase their funds by teaching elocution to young men who intended to devote themselves to the clerical and legal professions. Mr. Dion Boucicault moved a resolution to the effect that the meeting approved of the project of the School of Dramatic Art, and trusted that means might be taken to carry it into effect. Eventually it was hoped the school would meet with such success that it would receive a Government charter. Mr. Henry Neville seconded the resolution, which was carried.

**Proceedings against a Music-Hall Proprietor.**—At the Southwark Police Court, on Wednesday, Mr. Hart, the proprietor of the Raglan Music-hall, Union-street, Borough, appeared to answer an adjourned summons for neglecting to make the necessary alterations required by the Metropolitan Board of Works, under the provisions of the Act of 1878 relating to fires in theatres and music-halls, for the protection of the public. Mr. Beesley (instructed by Mr. Barton) appeared for the Metropolitan Board of Works. Mr. Beesley said the Act gave power to the Metropolitan Board of Works, with consent of the Secretary of State, to require of the owners to make such alterations as might be necessary for the safety of the public, within a reasonable time; in default, a penalty of 50*l.*, and 5*l.* a day could be imposed. On July 17, 1881, the defendant was served with a notice specifying what alterations were required. He made certain alterations, but failed to make the most material alterations, such as making the doors to open outwards and making a free way from the hall at the rear of the stage. Mr. Hart said he would have the doors altered immediately, and would endeavour to make some arrangement with the other tenants of the premises at the rear of the stage to open a passage into Ewer-street. Mr. Slade, the magistrate, inflicted a nominal penalty of 10*l.*, and 5*l.* 5*s.* costs.

**Railway Projects.**—The Select Committee of the House of Commons appointed to consider the South-Eastern Railway Bill (new lines and widenings), which proposes to widen the present line from Cannon-street to Charing-cross, and also to widen the Charing-cross railway-bridge and the Cannon-street railway-bridge, have concluded their sittings. Mr. Morgan Lloyd, the chairman, after consultation with the rest of the Committee, announced that they had decided to consider the preamble proved, subject to a limitation being inserted in the Bill that the Charing-cross-bridge should not be widened by more than 48 ft. Another select committee have passed a bill authorising an extension of the London, Tilbury, and Southend Railway, commencing at their terminus at Southend and terminating at Shoeburyness, a distance of nearly four miles. The same Bill also gives powers to the company to construct a railway 19½ miles in length from Barking to Pitsea, in order to shorten the existing route between London and Southend.

**Mr. James Bubb,** the well-known Clerk of Works at Truro's new cathedral, passed peacefully away shortly after nine o'clock on Wednesday morning (May 17). He had been with Mr. Pearson a great number of years, and had had the practical carrying out of many of that eminent architect's best churches. Mr. Bubb was unmarried and in the prime of life. The funeral is arranged to take place on Saturday afternoon.

**Architecture at the Mansion House.**—The Right Honourable the Lord Mayor (Ellis) and the Lady Mayoress, at the Mansion House, entertained at dinner on Thursday evening last, too late for further notice in our present issue, representatives of the professions of architecture and surveying.

**Passed Candidates in the First Obligatory Architectural Examination.**—At the meeting of the Royal Institute of British Architects, on Monday evening last, the following gentlemen, having satisfactorily passed the Obligatory Examination, held in March last, were recommended for admission as Associates of the Institute, viz.:—Messrs. John William Simpson, Mitre-court-chambers, Temple; Arthur Sutton Gayer, Queen-street, Chesham; Francis Hooper, Hayne-road, Beckenham; Nathaniel James Stanger, Trevellick-crescent, St. John's, S.E.; Charles James Tait, Highbury Park; Charles Stoward Smith, Friar-street, Reading; George Alexander Thomas Middleton, Bedford-hill, Balham; Thomas Bestook Whinney, Regent's Park-road; Samuel Cuthbert Rogers, Bedford-row; Percie Cowper, Frederick-street, Gray's Inn-road; Edwin William Poley, Lady Somerset-road, Highgate; and Robert William Bousfield, Clifton-gardens, Maida-vale, W. Five other candidates, making seventeen in all, passed the Examination, out of a total of twenty-two who entered.

**The Corporation of London and the Polluted State of the Thames.**—At the last meeting of the Court of Common Council, it was resolved, on the motion of Mr. E. G. Wood, "That it be referred to the Port of London Sanitary Committee to inquire into the increasingly polluted state of the river Thames, in consequence of the large quantity of sewage discharged from the outfalls at Barking and Cressness, with power to invite and take evidence, and to report fully to this court thereon, with such recommendations as they may deem expedient for carrying out so important and urgently required an undertaking as the purifying of the river, and with authority to confer thereon with the Commissioners of Sewers and any other public body they may think desirable; and that it be referred to the Port of London Sanitary Committee, with power to confer with the Commissioners of Sewers as to the advisability of preparing a Bill for Parliament or otherwise for the prevention of such pollution, and reporting thereon to this court."

**Wall Sewage Farming Pay?**—This question was answered in the affirmative by the chairman of the Sewage Committee of the Town Council of Wolverhampton at its quarterly meeting last week, who in analysing the annual balance-sheet of the Corporation Sewage Farm, claimed that, whilst farmers generally in the neighbourhood were absolutely losing money, the Corporation were able to say they had paid a liberal salary, had charged interest on capital, which very few farmers ever dreamt of charging, and had yet realised 34*s.* per acre by the Barnhurst Farm. This fact (says the *Staffordshire Advertiser*) is the more remarkable inasmuch as the Town Council is anything but an association of theoretical or practical agriculturists, and the main object of the farm is to consume the sewage of the town.

**Mr. Richard Cull, F.S.A.**—An effort is being made by the friends of Mr. Richard Cull, of Tavistock-street, Bedford-square, to raise a fund, partly in recognition of public service, but, specially, to create some provision for the wants of his declining years. We are sorry to hear this has become necessary in consequence of nearly two years' illness, whereby Mr. Cull has been incapacitated from pursuing his literary avocations, and of the entire wreck, through a disastrous investment, of the small fortune upon which he has hitherto been chiefly dependent for support. Mr. Cull was for six years hon. secretary to the Technological Society, and edited two volumes of its "Transactions," and he was past editor of "The Comprehensive Dictionary." The Rev. Canon Nisbet, treasurer of the fund, at No. 16, Bedford-square, will gladly receive subscriptions.

**Hookham's Fasteners for Pictures.**—Messrs. Tonks & Son, instead of thanking us for advertising their wares in a paragraph, write to suggest that we ought not to say these fasteners have not yet come into general use, because they have sold more than 800,000 pairs since the patent was taken out. How far would 800,000 pairs go if the fastener were really to come into general use?

**Battersea.**—We understand that Messrs. Satchwell, of 31, Cheapside, have sold by private treaty the freehold estate, consisting of ninety houses and shops, being the whole of Motley-street and Motley-place, Queen's-road, Battersea, producing a rental of 3,000*l.* per annum. Six or seven years ago the ground on which these houses stand was covered with cabbages.



The New Eddystone Lighthouse was dedicated to its beneficent work on Thursday last by H.R.H. the Duke of Edinburgh. The new lighthouse has been erected from the plans and under the supervision of Mr. Douglass, the engineer to the Trinity Board. The tower is built wholly of granite, obtained from the De Lank Quarries, near Bodmin, and the great expenditure with which the work has been completed, much within the expected time, has been mainly due to the manner in which Messrs. Hugh Sharrer & Co., the owners of the quarries, have carried out their part of the undertaking. The tower has, in fact, been constructed at De Lank, every stone having been finished there and marked for the place it was to occupy. The blocks of the lowest, or cylindrical portion, are each 6 ft. 6 in. deep, 2 ft. thick, and 8 ft. 10 in. in their outer circumference, and they are all without a flaw. Throughout the whole tower every stone is dovetailed, by projections and grooves, into those above, below, and on either side of it.

**Competition: Royal Asylum of St. Anne's Society.**—The committee seem to have taken pains that the competition invited by them in designs for new buildings at Redhill, Surrey, should be rightly conducted and have a satisfactory result. They have appointed Mr. Whicheard, F.S.A., as professional assessor, and that gentleman has assisted them in preparing the Conditions of Competition. The designs are to be sent in on the 21st of June, and it is proposed to employ as architect the author of one of the three selected designs, subject to his producing satisfactory evidence of his experience and capacity; but no competitor will be employed to carry out the work unless an actual tender be obtained from a responsible contractor at a price not more than 10 per cent. above his estimate.

**The Birkenhead Competition.**—The authorities decline to communicate officially the names of the four selected competitors. It is generally understood, however, that two hail from London and two from the provinces, and that the former are Mr. Gooch and Mr. Henry Hall.

**Value of Property in the City.**—Mr. F. Ellis Morris, of the Poultry, sold by auction, at the Mart, on Wednesday last week, the freehold premises, No. 9, Cornhill. The property realised 25,060*l.*, or about 33*l.* per superficial foot, and 1,565*l.* 10*s.* per foot frontage.

TENDERS

For warehouse, Jewin-street, City. Messrs. Ford & Fletcher, architects. Quantities supplied.

Higgs & Hill	2,874 0 0
Perry & Co.	2,872 0 0
Hall, Ballard & Co.	2,833 0 0
Peto Bros.	2,808 0 0
Lawrence	2,772 0 0
McLachlan & Sons	2,763 0 0
Cynder	2,752 0 0
Simpson & Son	2,715 0 0
Brass	2,682 0 0
Aschey Bros.	2,678 0 0
Severn & Co.	2,672 0 0
Priestley & Co.	2,563 0 0

For pulling down and rebuilding the Britannia Tavern, Leaking, for Mr. W. Evans. Mr. C. J. Dawson, architect.

Reed, Stratford	21,494 0 0
Mansfield, Stratford	1,395 0 0
Harbert Bros., Flatford	1,367 10 0
Salt, Burdett-road, Bow	1,268 10 8
Hawkins, Mile-end	1,178 0 0
Wood & Slop, Poplar	1,162 0 0
Argent, Barking	1,144 0 0
Atherton & Latta, Poplar (accepted)	1,140 0 0

For alterations, additions, and repairs to the Stag public-house, Dorset-street, Baker-street. Mr. F. W. Hunt, architect. Quantities by Messrs. Vissal & Kennedy.

Thou	2,700 10 0
G. Shaw	675 0 0
H. Hopkin	614 0 0
W. H. Butcher	568 0 0
E. Harris & Sons	563 0 0
J. & H. Cocks	528 0 0

For house and shop, for Mr. Eyles, Flashed-road, West M. Messrs. Hill & Fletcher, architects. No quantities.

Repton	273 0 0
Anglo	325 0 0
Alexander	610 0 0
Salt	490 0 0
Baxter	479 0 0
England	363 0 0
Martin	460 0 0

For painting and repairs at the Licensed Victuallers' Hall, Kennington-lane. Mr. H. I. Newton, architect.

Years	126 0 0
Pickersill Bros.	157 0 0
Shoobred & Co.	159 0 0
Walker (accepted)	98 0 0

For additions and alterations to the Salop and Montgomery Counties and Borough of Wenlock Lunatic Asylum, Btton, Shrewsbury. Mr. Thomas Grove, architect. Quantities by the architect and Messrs. Strudwick & Mennie.

Old Materials.	
Thos. Bovey, London	264,870 .. 2203
Martin, Wells & Co., Aldershot	62,003 .. 607
J. Jones & Sons, Sedgley	59,000 .. 603
Stevens & Bastow, Bristol	57,000 .. 602
Josh Wood & Sons, Worcester	56,704 .. 915
C. H. Marshall, Birmingham	54,368 .. 1,275
H. Bennett, Rugby	55,150 .. 103
John Grosvenor, Tunstall	53,500 .. 444
R. Price, Shrewsbury	53,500 .. 725
W. J. Webb, Birmingham	52,900 .. 710
Treasure & Son, Shrewsbury	52,135 .. 874
E. C. Howell & Son, Bristol	52,000 .. 280
H. Lovatt, Wolverhampton	50,668 .. 688
W. Holdsworth, Bradford	50,460 .. 500
J. Parnell & Son, Rugby	50,412 .. 709
H. Gabbatt, Liverpool	49,980 .. 680
P. Foreman & Co., Wolverhampton	49,540 .. 580
John Gaskill, Birmingham	48,300 .. 600
J. Wood & Son, Leicester	47,605 .. 528
Samuel Warburton, Manchester	46,000 .. 573

Mr. John Laidlaw, of Boyon-road, Camberwell, was appointed clerk of the works, under the direction of the architect, out of 115 applicants.

For sinking an artesian well and erecting pumps, engine, and gearing at St. Luke's Workhouse, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Sons, architects.

Well. Pumps. Engine, &c.	
Benham & Sons	22,274 18 3 .. 2,490 0 0 .. 2,495 0 0
Tiley	1,683 14 4 .. 470 10 6 .. 487 17 6
Ponting & Wood	1,490 2 0 .. 455 10 0 .. 458 0 0
Potter	1,340 18 0 .. 378 0 0 .. 358 0 0
May (accepted)	1,369 10 10 .. 540 0 0 .. 357 10 0

Additional if pumps are required to be fixed below water line and has legs run 200 ft. into chalk.

Benham & Sons	22,304 10 0
Tiley	945 11 8
May	770 8 8
Ponting & Wood	520 8 0
Potter	477 8 6

For alterations and additions to Christ Church Schools, Derby. Mr. J. B. Naylor, architect. Quantities supplied.

S. Bakewell, Derby	21,210 0 0
E. Wood, Derby	1,176 0 0
J. Wood, Derby	1,165 18 6
A. Smith, Derby	1,077 0 0
G. Hewitt, Derby (accepted)	863 0 0

For the erection of an Independent Methodist Chapel to be erected in Ellastreet, Fendleton. Messrs. Maxwell & Tuke, architects.

Southern & Son (accepted).

For alterations and additions to 57, Foregate-street, Worcester, for Mr. James Gaunt. Mr. A. Hill Parker, architect.

J. Wood & Sons	2,797 0 0
F. Wells & Sons	717 0 0
J. H. Beard	760 0 0
J. Bourne	620 0 0
Dixon Bros., Worcester (accepted)	583 0 0

Hot-Water Apparatus.

Greenhow	532 10 0
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For villa residence, Barbourne, Worcester, for Mr. H. A. Firkins. Mr. A. Hill Parker, architect.

F. Wells & Son (accepted on schedule of prices).

For two chalet residences at Harrow-on-the-Hill. Mr. J. T. Walford, architect. Quantities supplied.

Houses. Stables. Drains. for Pitch.	
L. & H. Roberts	29,212 .. 21,211 .. 2,150 .. 2,130
Collis & Sons	9,041 .. 1,130 .. 160 .. 430
Hall, Reddell & Co.	8,268 .. 1,027 .. 140 .. 410
Patrick & Son	8,350 .. 948 .. 100 .. 245
Kirk & Randall	7,475 .. 841 .. 103 .. 320
McLachlan & Sons	7,381 .. 894 .. 94 .. 247
Waterman	7,186 .. 572 .. 78 .. 319

For Worsley Main Drainage. Contract No. 7, being the extension of the main sewer in Worsley-road, near Broad Oak, for the Barton-upon-Irwell Sanitary Authority. Quantities supplied by the engineer, Mr. John Price.

James Jackson, Walkden	2110 0 0
Edmund Bird, Chorlton	88 13 0
James Oakes, Kearsley (accepted)	84 8 6

Accepted for Flinton house-connections. Contract No. 6, being the drainage of certain houses in the township of Flinton, for the Barton-upon-Irwell Sanitary Authority. Mr. John Price, surveyor.

Edmund Bird, Chorlton.

Accepted for Urmoston house-connections. Contract No. 7, being the drainage of certain houses in the township of Urmoston, for the Barton-upon-Irwell Sanitary Authority. Mr. John Price, surveyor.

Samuel Cowburn, Hindley.

For erecting an additional building at piano-factory, Grately-road, Kenilworth Town, for Messrs. Brinsford & Son. Mr. C. E. Evans, architect. Quantities by Mr. Geo. Fleetwood.

Gregory & Bewce	23,888 0 0
Edwards & Son	2,444 0 0
Roberts Bros.	2,436 0 0
Grover	2,347 0 0
Perkins	2,347 0 0
Higgs & Hill	2,289 0 0
Toms	2,119 0 0
Manley	2,060 0 0

For decorations at Craven-hill, for Mr. J. Davis. Mr. W. Sackham Witherington, architect.

Nesbitt & Co.	21,274 6 0
Shoobred & Co.	950 19 0
W. B. Simpson & Sons	895 5 0

For new reservoir, for the Horsham Local Board.

Harrison	22,990 0 0
C. Dickinson	2,000 0 0
Dibbey	2,100 0 0
Crookett	2,050 0 0
J. Potter	2,043 2 0
T. B. Hayler	1,930 0 0
E. Etheridge	1,910 0 0
Chamberlain	1,911 0 0
Lapthigh & Tutterly	1,853 0 0
Ford & Everest	1,797 0 0
P. Peters	1,777 0 0
Strachan & Co.	1,720 0 0
Bedford	1,654 0 0
Rotheridge Bros.	1,613 0 0
Pannett Bros.	1,123 0 0
T. Skinner (accepted)	1,214 0 0

For extension of St. Paul's-road Board Schools. Mr. E. K. H. Brown, architect. Quantities by Messrs. Northcroft, Son, & Neighbour.

H. Hart	24,450 0 0
F. & F. J. Wood	4,587 0 0
T. Boyce	4,239 0 0
H. B. Nightingale	3,983 0 0
Kirk & Randall	3,973 0 0
R. J. Gerrard	3,973 0 0
W. Oldrey	3,858 0 0
Atherton & Latta	3,603 0 0
J. F. Sargeant	3,498 0 0
C. Cox	3,394 0 0

For enlargement of St. Clement-road Board Schools. Mr. B. R. Robson, architect. Quantities by Mr. Thornton Green.

J. Rankin	23,992 15 0
Lathey Bros.	3,985 15 0
W. Oltrey	3,817 0 0
C. W. Reading	3,744 0 0
G. S. Pritchard	3,696 15 0
W. Tongue	3,673 0 0
Higgs & Hill	3,595 0 0
C. Wall	3,532 0 0

For rebuilding Nos. 1, 29, and 30, Church-way, Somers Town, for Mr. Geo. Carter. Messrs. J. Saville & Son, architects.

Tittmus	22,075 0 0
Richardson	2,050 0 0
Hayworth	1,979 0 0
Stephen Bros.	1,968 0 0
Nightingale	1,843 0 0
Wall Bros.	1,836 0 0
Shurmer	1,781 0 0
Lamhle	1,737 0 0
Royal (accepted)	1,779 0 0

For the sanitary work, alterations, and decorator's work, for the Granville Hotel, Ramsgate.

J. & J. Greenwood, London (accepted) 22,353 0 0

For new road and sewers, for the proprietors of the Adlington Estate, West Brighton. Mr. Arthur Lewis, surveyor.

J. Harrison, Brighton	2,888 0 0
A. Oliver, Brighton	803 0 0
H. Woodams, Brighton	719 0 0
J. Longley, Worthing (accepted)	700 0 0

For warehouse, for Messrs. Fendal Phillips & Sons, between Queen's Head-passages and Lovell's-court, City. Mr. Thos. Chamberlain, architect. Quantities by Mr. S. B. Wilson.

Patrick & Son	210,995 0 0
Holland & Hannen	10,233 0 0
Lister	9,988 0 0
Morter	8,865 0 0
Asby Bros.	9,850 0 0
Wm. Brass	9,567 0 0
Fish, Prestige, & Co.	9,549 0 0
Hall, Beddall, & Co.	9,145 0 0
Richard Couder	9,100 0 0

For new sewers, &c., in New-street, Bishopsgate, King's Arms-yard, and Trump-street, for the Honourable the Commissioners of Sewers of the City of London.

Botterill	26,642 0 0
Mears	2,914 0 0
Crookett	2,850 0 0
Mowlem & Co.	2,213 0 0
Ford & Everett (accepted)	2,185 0 0

For erecting three shops and office at Enfield, for Mr. H. Clarke. Mr. John Groom, architect. Quantities by Mr. M. W. King.

Poeock	21,700 0 0
Sayer	1,400 0 0
Fairhead	1,523 0 0
Hampton	1,503 0 0
Mattock Bros. (accepted)	1,493 0 0

For the erection of tobacco warehouse, at Portes, for Messrs. Cavender. Mr. A. H. Bone, architect.

Shurmer, London	21,393 0 0
Cooper, Portsmouth	4,355 0 0
White, Portsmouth	4,335 0 0
Evans, Portsmouth	4,330 0 0
Burbridge, Portsmouth	4,192 0 0
Light, Portsmouth	4,110 0 0
Vard, Portsmouth	4,080 0 0
Lewis, Portsmouth	3,959 0 0
Hayter, Portsmouth (accepted)	3,860 0 0
Stevens, Southampton	3,749 0 0

For the erection of an Orkney Combination post-houses, Kirkwall. Mr. T. S. Peace, architect. Quantities by Mr. Andrew Lawrie.

Wm. Robertson, Stromness	22,776 0 0
Peter Chears, Kirkwall	2,592 0 0
Jas. Drever, Stromness	2,396 4 0
Robert Cumming, Kirkwall	2,314 4 0
Wm. Firth, Kirkwall (accepted)	2,308 0 0

For providing and fixing Venetian blinds to infirmary, &c., at Mitcham Schools, for the Guardians of the Poor of the Holborn Union. Messrs. H. Saxon Snell & Sons, architects.

G. Hawkins	2136 0 0
S. Haskins Bros.	113 18 0
Jones & Son (accepted)	73 4 8

For the erection of new offices for the Portland Estate, Queen Anne-street. Contract 1, foundations. Mr. C. Fowler, architect. Quantities by Mr. H. Lovegrove:—  
J. Woodward ..... 345 0 0  
Williams & Son ..... 337 0 0  
R. Conder ..... 330 0 0  
Bange & Co. .... 237 0 0  
B. E. Nightingale (accepted) ..... 237 0 0

For the erection of new Sunday-schools, Banbury, Oxon. Mr. Chas. Bell, architect. Quantities by Mr. H. Lovegrove:—  
Smith ..... £4,111 0 0  
Orchard ..... 3,899 0 0  
Davis ..... 3,391 0 0  
Kingle ..... 3,318 0 0  
Ireson ..... 3,940 0 0  
W. Jones, Gloucester ..... 3,790 0 0  
Kimberley (accepted) ..... 3,772 0 0

For the erection of a Wesleyan school chapel at Gospel Oak. Mr. Chas. Bell, architect. Quantities by Mr. H. Lovegrove:—  
Brass ..... £2,443 0 0  
Goodman ..... 2,398 0 0  
Holliday & Greenwood ..... 2,349 0 0  
Allen & Sons ..... 2,342 0 0  
Manley ..... 2,237 0 0  
Gould & Brand ..... 2,193 0 0  
Gregar ..... 2,179 0 0  
Toms ..... 2,174 0 0  
Suech Bros ..... 2,196 0 0  
Scrivener (accepted) ..... 2,078 0 0

For alterations to the Whale Inn, Canal side, Swinden New Town. Mr. W. Drew, architect:—  
Webb ..... £278 0 0  
Phillips & Powell ..... 381 0 0  
Thomas ..... 345 0 0  
Wiltshire ..... 334 15 0  
Looker ..... 328 10 0  
Henley ..... 323 0 0  
Barrett (accepted) ..... 322 11 0

For building factory, Long-walk, Bermondsey-square, for Mr. John Feaver. Messrs. G. Elkington & Son, architects:—  
Hind ..... £5,879 0 0  
Hoar & Son ..... 4,774 0 0  
J. & J. Greenwood ..... 4,498 0 0  
Jerrard ..... 4,378 0 0  
Gregar ..... 4,298 0 0  
Lawrance ..... 3,981 0 0  
Tarrant & Son ..... 3,949 0 0

For stables, for Mr. Simmonds, Forest-gate. Mr. J. T. Wesley, architect:—  
Shurmer ..... £219 0 0  
Taylor & Perdit ..... 153 0 0  
Palmer ..... 153 0 0  
Hearle & Son (accepted) ..... 143 0 0

For the erection of schools, Matthias-road, for the School Board for London. Mr. E. B. Robson, architect:—  
Reading ..... £11,362 0 0  
Grover ..... 11,239 0 0  
Wall Bros. .... 11,187 0 0  
E. Lawrence ..... 11,089 0 0  
Atherton & Latta ..... 11,066 0 0  
W. Brass ..... 11,050 0 0  
Scrivener & Co. .... 10,989 0 0  
W. Shurmer ..... 10,989 0 0  
C. Cox ..... 10,987 0 0  
Bargant ..... 10,750 0 0  
T. Boyce ..... 10,683 0 0

For new road and pipe sewers at Wands-worth:—  
Killingback ..... £399 0 0  
Pizzey ..... 899 0 0  
Green ..... 895 0 0  
Meas ..... 760 0 0  
Ford & Everett ..... 694 0 0  
Nowell & Robson ..... 670 0 0

For brick tank, two gas engines, and engine-shed, for the Acton Local Board:—  
Ford & Everett ..... £3,243 0 0  
Bell ..... 2,850 0 0  
Cookard & Co. .... 2,852 0 0  
Bolton ..... 2,160 0 0  
Dickson ..... 2,455 0 0  
Pizzey ..... 2,350 0 0  
Nowell & Robson ..... 2,035 0 0  
Funnigan (accepted) ..... 1,604 0 0

For new shop fronts, 69 and 71, Finsbury-pavement, and 2 and 3, Little Moorfields, for Mr. R. Morley. Mr. W. Beckham Witherington, architect:—  
Luscelles ..... £680 0 0  
Russell ..... 562 0 0  
Scrivener & Co. .... 533 0 0  
Larke & Son ..... 540 0 0

For repairs, alterations, and re-decorating 7, Russell-square, for Mr. J. T. Smith. Mr. Frank Goldring, surveyor:—  
John Grover ..... £301 0 0  
Emery ..... 464 0 0  
Baber ..... 448 0 0  
Bennett ..... 412 0 0  
Conway (accepted) ..... 387 10 0

For the erection of a mission church at Acton Green, for the Rev. A. H. Dunn, M.A. Mr. Edward Monson, jun., architect. Quantities supplied:—  
Geo. Hooper, Acton ..... £1,380 15 1  
C. G. West, Acton ..... 1,323 13 0  
John Parker, Acton ..... 1,298 0 0  
Penny & Durrant, Raling ..... 1,259 0 0  
M. W. Rowles, Acton ..... 1,245 0 0  
Thos. Brundell, New Bedford ..... 1,185 0 0  
Wilkinson, Bros., Finsbury Park ..... 1,173 0 0  
Chas. Mason, Kew ..... 1,123 0 0  
Joseph Dorey, Old Bedford ..... 1,064 0 0  
John Cardus, Acton (accepted) ..... 994 0 0

For building four houses, Queen Elizabeth's Walk, Strand, Newington, for Mr. J. B. Sutton. Mr. C. H. Worley, architect. Quantities by Mr. Fife:—  
Mattock, Bros. .... £3,020 0 0

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Vol. XLII. No. 2091.

SATURDAY, MAY 27, 1893.

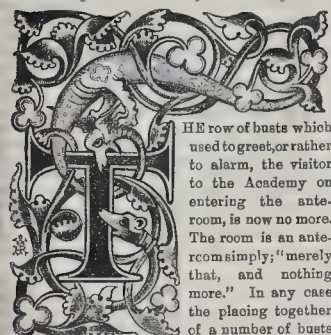
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Sculpture at the Royal Academy.



THE row of busts which used to greet, or rather to alarm, the visitor to the Academy on entering the ante-room, is now no more. The room is an ante-room simply; "merely that, and nothing more." In any case the placing together of a number of busts of more or less uninteresting persons in one long row on a shelf is not a fortunate way of disposing them. It reads like a kind of notice to visitors,—"Here are ye pot-boilers"; and it is much better to disperse them here and there among works of another class. We are led to conclude, however, that sterner measures than this have been resorted to, and that there must have been an extensive massacre of the innocents in the shape of busts, for certainly the aggregate number to be picked out from among the sculpture seems to be much smaller than it was when there was not only one row in the ante-room but another still larger one in the sculpture gallery in the rear of the building. This weeding out must, we fear, have been attended with grief to a good many people, but we cannot blame the Academy in this respect, however we might be disposed to blame them for some others of their rejections. The state of sculpture is so prosaic at present, the production of mere common-place likenesses of common-place people is something so far apart from the true ends and powers of the art, that some check on the wholesale exhibition of this class of work really seems called for.

One of the best works in the Academy this year is, nevertheless, a portrait statue, that of "the late Rajah Kali Krishna Bahadur" (1573), by Mr. G. Simonds. This is a curious, and, perhaps, unexpected pendant to the last large work by the same sculptor that was in the Academy, the "Dionysus"; but though this cannot, of course, reach the interest of an ideal subject, it is a statue of no common order, as all must have admitted who saw the original marble under the admirable lighting and arrangement which gave it such effect in the sculptor's studio. The original being due in India, the work is only represented by a cast at the Academy. The Rajah is represented seated, dressed in long robes, which are treated in a fine sculptural style; the countenance is meditative in expression, the attitude that of dignified repose. This will, no doubt, take rank as one of the best English portrait statues of late years; it must,

in fairness to others, however, be admitted that its author has had an immense advantage in the Oriental dress, which is so suitable for the sculptor's purpose, and that no sculptor who has been tied down to every-day English costume in a portrait statue can be said to be fairly represented for comparison with an Oriental one. This is emphatically shown in the two colossal statues of the late Sir Rowland Hill, by Mr. Brook (1546), and Mr. Onslow Ford (1556), each representing the patron saint of the Post-office in a frock-coat. Mr. Brook's is the best work of the two; he has obviously aimed at giving as much ease and grace of line to the figure as the difficulties of the costume will allow him, and when seen in a more unconfined manner in the open air it will, we believe, be adjudged to be more successful than the average of portrait statues in European dress; but it is a rather sad sight for all that.

Mr. G. A. Lawson's "Automate" (1696), is a cast of a life-size heavily draped female figure, which, we presume, represents one of the Danaides. She carries under her left arm a large jar, her head and the upper part of her figure being drawn towards the right in the effort to sustain the weight; the face is turned partly upwards, and eyebrows raised with an expression of weariness and hopelessness. The drapery falls in long folds crossing the figure in the direction of its strain, and adding to the look of drag of the whole. This is a very fine work, and we should be glad to see it another year in marble. Mr. Thornycroft's "Tencer" is re-exhibited in consequence of its purchase by the Academy; we spoke of it last year. It is a figure that gains on further acquaintance, and we like it better this year than formerly. Both this and Mr. Lawson's figure may be cited as examples of sculpture which represent the best and highest use of sculpture,—the representation of a moment of impressive action in an ideal figure, from which every realistic association is removed. Each of them is a thought fixed in plastic form; no imitation of any figure of real life (that is the office, or one office, of painting), but an abstract ideal brought into visible form. It is unfortunate that there is so little in English sculpture to come under this category, though no doubt it is partly the fault of the public, who do not seem to want ideal sculpture, or to understand it when they get it. Some sculptors might be glad to give their minds to the ideal, and do so with success, who are forced to gain bread by the production of the real. This applies, no doubt, to every branch of high-class art, but it seems to be peculiarly the case with sculpture, where the disproportion between the artist's aspiration and his opportunities seems to be greater than in any other art.

Among the subjects ranged round the central Hall we notice one or two works which belong to the class of imaginative art, though it can hardly be said that any of them are of high importance. Mr. A. G. Atkinson's "Stephen the Martyr" (1548) is an attempt to illustrate

that most pathetic incident in the Acts of the Apostles, the last words of the martyr to Jewish bigotry as he knelt down amid the shower of stones, and prayed for those who were murdering him. It is a noble subject, and the sculptor has shown true feeling at least in his treatment of it. The figure is nude, kneeling with his hands bound behind him, the face upturned, with an expression of pain and of just failing consciousness. The figure is thus a sad one to look at, and hardly rises to the height of the subject. If the artist could have realised the expression of happiness in a beatific vision (which the reader will remember is included in the Bible narrative), struggling with but overcoming the expression of physical suffering, he would have done a higher, we may also add a much more difficult, task. As it is, he has represented the pain rather than the triumph of the martyr's death; but we are, nevertheless, grateful to any sculptor who gives his mind to work of this stamp. Mr. S. Fry exhibits a work also of ideal class, "There is no Way but this" (1544), a terra-cotta half-length figure of a woman unsheathing a dagger, with the intention evidently of using it against her own life. Half-length is an awkward method in sculpture; the figure looks as if it were a portion of a statue of which the lower half is missing, and the face is rather coarsely modelled, and not very expressive of the situation, but there is an idea in the work. The "Lancashire Witch" (1571), by Mr. Percival Ball, is a highly-finished and gracefully-modelled marble figure of a nude woman breaking a sword across her knee; we cannot profess sufficient recollection of the story of the Lancashire Witch to enter precisely into the meaning of the action and of the accessories; it may be partly on this account that we cannot find the work very interesting.

In the lecture-room "The Kiss of Victory" (1597) by Mr. A. Gilbert, a group of two figures about one-third the size of life, embodies a fine idea, falling short through want of power and style in execution. It represents a naked warrior, who may be supposed to have been just victorious in a combat, throwing his head back to receive the kiss of a winged figure of Victory behind him. This is a splendid motif for a group, but the sculptor has not realised it; it is tame, deficient in energy and intensity. Mr. Milo Griffith's "The Ancient Woodman" (1699), is by no means deficient in vigour of action; this is a life-size terra-cotta representing, we presume, the Man of the "Stone Age," for he has a hatchet with apparently a stone head, with which he has cleft the trunk of a tree, and driven wedges into it, and is now finally rending it apart with his hands. But the face has far too much of the expression of the modern man, though a rough one, than of what we might suppose to be the physiognomy of the inchoate man of a long-past epoch. If the sculptor could have reproduced that man for us he would have done something really poetic, though in a *bizarre* way; as it is, his work can only have the praise of being spirited as a figure. Mr. F.



Callcott's figure of a mother and child, "A Mother's Love" (1,620), owes its origination to Dalou, and certainly does not reproduce the peculiar *finesse* which the distinguished French sculptor is able to impart to figures taken from rustic life; but it is a very pleasing group. How the honours are divided between Mr. Fogys Cockerell and Signor A. Fabbrucci, who own the joint authorship of the "St. George and the Dragon" (1,624), we do not ascertain; did one model the knight and the other clothe him in armour, or did one design the knight and the other the dragon? The statue is what may be called an adequate representation of a young man in armour with one foot on the head of what the Germans call a "warm"; but of any great ideal of St. George the group is quite innocent. There is a pretty rustic figure by Mr. Kummer, called "Aschenbrödel" (1,664), and a clever figure by Mr. Armstead, called "Ariel" (1,680), and characteristic enough of Ariel in the doubled-up attitude, as if watching for commands, and in the thin like limbs; but there is nothing of Ariel in the face, which is much too old and too tame, and even sad in expression, for Shakespeare's gay and fanciful child of the elements. A small figure of "Undine" rising out of the well (1,633), by Miss Walters, wringing her hands above her head, as described in Fouqué's wild tale, shows real poetic feeling and pathos.

In the Central Hall every one who passes is brought up by two little terra-cotta figures, by Signor L. Fabbrucci, entitled "Waiting for Mamma" (1,578), two small children, whose efforts at patience are gradually giving way to uneasiness and a little tendency to pouting. This is a most charming realisation of childish manner and nature, one of the most successful things of the kind that we have seen, and it is quite amusing to sit near it and watch the smile of pleasure and interest which it calls up in the face of every one who pauses before it: it is "the one touch of nature" very happily illustrated. "A Waif" (1,564), a single terra-cotta figure of a street Arab, by Signor Lucchesi, which is placed as a *vis-à-vis* to the last-named work, is also successful in its way, and rather pathetic in the expression of the face. Among the larger portrait-works here one of the most important is Mr. Boehm's statue of Lord Lawrence (1,566), to be placed in bronze in Waterloo-place. Mr. Boehm's work will, at any rate, be a contrast in manner and feeling to one or two very tame portrait-statues which now occupy that site. His figure represents Lord Lawrence in the act of propounding to an assembly of Hindus the question, "Will you be governed by the pen or by the sword?" The two implements of sway being held in either hand with an action appropriate to the words; but in accordance with what was the real wish, no doubt, of the speaker, the sword is kept rather in the background, the pen held forth more freely. Lord Lawrence is represented in the rather *démodé* costume which the climate he was in rendered necessary: the action of the figure, the head thrown back and the body thrown forward, is certainly not elegant, and we should say is exaggerated, even as the expression of a moment of eager and decisive appeal in the middle of a speech; but, in spite of this, the statue has, at all events, the merit of being characteristic and forcible in manner and expression, and not out on the regulation type of our public statues. We did not allude to Mr. Boehm's fine statue of Carlyle seated, of which the marble edition is in this exhibition, because in its terra-cotta form it was previously exhibited, and was the subject of much attention. A bronze replica of it is to be placed "on the Thames embankment"; we presume on the Chelsea Embankment, near the spot where Carlyle lived, and where his figure was familiar. It will be one of the best records of a distinguished man of the time which contemporary sculpture has produced. A small model of Mr. Bruce Joy's statue of Mr. Gladstone, for East London, is in the Lecture Room, and in this form, as in the case of the full-sized model when we saw it elsewhere, impresses us as an admirable work, a good likeness, and fine and impressive in action. Several portraits by Mr. H. R. Pinker show that this gentleman, with whose name we are not familiar, is destined to take a very good place among our portrait sculptors at least. His bust of the "Postmaster-General" (1,627) is admirable, and almost equally so is the execution of the fine, keen head of the late Professor Rolleston, to be executed in marble for the University Museum at Oxford.

Mr. Woolner's life-size medallion of the head of the late Mr. Jas. Spedding (1,637), also a University Commission, to be placed in the ante-chapel at Trinity College, Cambridge, is a most delicately-executed piece of modelling, and is a form of portrait sculpture which, on some grounds, is preferable to a bust in the round: it enables the sculptor to escape from details which are sometimes at variance with sculptural effect, and to give a more abstract and ideal treatment to the work. There are some good bust portraits, however, among which we may particularise Mr. Bruce Joy's portrait of "Mr. Hermann Vezin" (1,560),—a bust almost Roman in its dignity. Among works of another class we would point out the statuette, "Friend or Foe" (1,629), by R. le Grand Johnston and R. J. Fennessey. It represents a camel and his driver passing through the desert, both admirably modelled, and evidently from the life.

The Lecture-room is unquestionably a great improvement on the old sculpture gallery, for sculpture, but before another year's exhibition it should be rendered a little more warm and attractive in effect by decoration and drapery. We have often pointed out that to place sculpture in the only nearly colourless room in the building is to place it under a disadvantage in regard to the general effect on the eye, which feels the sculpture to be so very cold after going over a number of pictures full of colour and hung on a highly-coloured ground. The sculptor rather gains than loses in individual effect by association with colour. We should suggest also that some few of the more important pictures might very well be grouped on the walls of the Lecture-room in combination with draperies; an arrangement which would conduce to the good effect of the Sculpture-room, and might set off pictures on a large scale and in a powerful style to exceptional advantage, while leaving some extra space clear on other walls for works which would otherwise have to be rejected.

#### THE INTERNATIONAL EXHIBITION OF PAINTING IN PARIS.

THE International Fine-Art Exhibition, the first of a series now being held in Paris, in M. Petit's handsome rooms in the Rue de Séze, near the Madeleine, promises to mark what may be fairly termed a new departure in the well-sustained history of French art. It may really be regarded as what the Germans would call an epoch-making innovation, when a strictly limited selection of the painters of England, of France, of Italy, Spain, Belgium, Russia, Germany, Austria, Sweden, and Holland, have agreed, at the invitation of a committee of three artists, to contribute their works for exhibition and comparison. When Mr. Millais and Mr. Alma-Tadema contribute each several pictures to represent England; Gérôme, Bandy, and Jules Dupré, to represent France; De Nittis, Italy; Madrazo, Spain; Alfred Stevens, Belgium; M. Bogoloboff and M. Pokitonow, Russia; Knaut and Meissel, Germany; Charlemont, Austria; Wahlberg, Sweden; and Josef Israels, Holland,—a selection of these works may fairly be said to constitute a display of ability such as has not been seen at any other previous period of history. Not but that there have been similar gatherings of pictures in former years, such as was seen in Hyde Park, in 1851; in Paris, in 1867 and 1878; and in other great exhibitions. Yet, on all these occasions, the masters of modern art have been so overwhelmed by the work of the less distinguished men, that the critical world has been unable fairly to arrive at an estimate of the real value of the best and the valuelessness of the mass.

It is not until we see, as we occasionally have the rare opportunity of doing, a selection of pictures where every canvas or panel is a real masterpiece, that we can form a correct judgment of the vast importance of the factor in civilisation that is supplied by art. It is not until we have visited again and again exhibitions of well-selected pictures that we experience the feeling of being really refreshed by art, instead of enfeebling the terrible sensation of fatigue that is caused invariably by a visit to such shows as we now so often have brought before us, large gatherings of pictures indiscriminately selected and injudiciously, if not thoughtlessly, placed in careless juxtaposition, the bad with worse, and the worst apparently everywhere.

It is impossible to visit the great exhibitions

of the day, the Paris Salon, the Royal Academy, and the Grosvenor, without feeling that the time has surely arrived when something like a new departure should be adventured on, and just such a one as that which, with the aid of M. Petit and MM. De Nittis, Madrazo, and Alfred Stevens, has now for the first time been made in Paris. How much we would like to see in London a similar attempt; if not an international exhibition such as the Parisians have imagined in order to counterbalance the weariness and commonplace character of their Salon (where more than 6,000 works of art are now being exhibited), an exhibition like that at the rooms of M. Petit, consisting of not more than eighty or so pictures, a selection of works of art chosen without prejudice and representing some special phase either of English or perhaps foreign art. An exhibition not a rival of the Parisian venture, not a business speculation, but even the enterprise of a generous worker, like Sir Coutts Lindsay,—whose kindness of heart causes him occasionally to relax his severe standard by admitting works of friends or of painters admired by a large section of the public,—but the selection of only a few, a very few, acknowledged great English painters, themselves independent of pecuniary gain, and anxious alone to promote a love of true art. Such an exhibition as by this means would be brought together would surely do much to create a correct knowledge of what is understood to be right, at least by a select few of the leading artists. By this means we should perhaps arrive at something like a standard by which the rising generation, of whom so many are now in pursuit of art, might be guided, and not, as is the case at present, bewildered by the variety of utterly adverse styles of art which are to be seen apparently done equal honour to at our exhibitions.

Unless some new direction is taken in the arrangement of our modern picture-shows they will indeed become the "bores" that they are too often accused of being; but classified as we hope some day to see them, and exhibitions of *genre*, of landscape and the other branches organised, they may again take the place that they are in reality intended to hold, as instructive schools to the professional and critical student, and pleasing exhibitions to the outside public,—not the mere commercial show-places into which they have been heedlessly, we are inclined to think, allowed to slope.

#### THE GREAT DIAMONDS OF THE WORLD.

THERE is something extraordinary in the fascination which the largest and most valuable specimens of the diamond have exercised on mankind. In the preface to the book\* in which he has examined the history of the most important diamonds known to the world, Mr. Streeter observes that the diamond has been of no less influence in the East than the very gods whose temples it has adorned. "It has been a factor in tragedies innumerable, supplying the motives of war and rapine, setting father against son, blurring the fair image of virtue, making life a curse where it had been a blessing, and adding new terrors to death. There is no intrigue however deep, no crime however shameful, which you cannot parallel in the history of famous gems." And this absolute rage for the possession of one of these shining bits of carbon does not seem to have been, in the East at least, of the nature of that "*auri sacra fames*," that accursed hunger for wealth, which has been the more comprehensible motive for many crimes. The Eastern potentates, who were ready to commit any crime to secure a famous diamond, did not appear to have coveted it for the sake of the money value which it represented, but for the mere glory of possession. One conclusion we may draw is, perhaps, that the habit of mind which would attach such special value to what is after all only a splendid gewgaw, is essentially a barbaric one, and that with advancing culture the money value of property of this kind, which is merely the measure of the desire of people to possess it, is likely steadily to diminish; though those who deal in this class of merchandise as a present may console themselves with the reflection that the demand for it will last their time at any rate.

\* "The Great Diamonds of the World, their History and Romance," collected from official, private, and other sources, during many years of correspondence and inquiry. By Edwin W. Streeter, F.R.G.S., &c. Edited and annotated by Joseph Hatton and A. H. Keane. London: G. Bell & Sons (no date).



The diamonds of sufficient importance to have a place in Mr. Streeter's pages are between seventy and eighty in number, to nearly all of which a separate chapter is devoted. Of these, some few much surpass the rest in size and value; but the reputed largest one, the Braganza, which, if genuine, would be priced, according to current usage, at many millions, is regarded by the author as of worse than doubtful reputation. The largest of which the reputation is tolerably established, is the Matan, belonging to the Sultan of Borneo; and even in this case it seems to be doubtful who has seen it and who has not, as it is more than supposed that in a majority of cases only a model of it has been exhibited to strangers who have obtained, as they supposed, permission to see it. There seems to be a curious mystery hanging about others of the reputed great diamonds; the Great Mogul, the history of which goes a considerable way back, having altogether disappeared, while it is supposed by some to be identical with the Kohinûr. Mr. Streeter, however, is convinced that they were separate stones, and that the Mogul was probably stolen from Delhi, where it was last heard of towards the end of the last century, and probably split into smaller stones. This, also, Mr. Streeter believes to be the case with what was known as the "Tavernier blue diamond," which was purchased from the eminent diamond-merchant and expert, Tavernier, by Louis XIV., for 100,000*l.*, and was stolen from the Garde Meuble, whither the Crown regalia had been transferred, in 1792, and never seen again in its original form. This was a splendid blue diamond of so unique a character that its sale would have been difficult to effect without detection; but as in 1839 there appeared in the market a blue diamond of similar character but smaller size, without any history, the conclusion that they are the same seems probable. Mr. Streeter gives a diagram showing the difference in shape between the "Hope blue" and the described shape of the Tavernier diamond, and how a piece might have been split off from it so as to alter its character and shape materially. The history of the Kohinûr, the finest, though not largest, of diamonds, is very fully written; and this and other chapters of the book contain a good deal of interesting matter, and the volume is useful also as a body of information on a curious subject.

The author remarks on the fact that none of the great diamonds have yet found their way to the American Republic. It may be observed that Republics generally (unless we call Venice a republic, which it was, however, only in name) do not develop the taste for costly toys of this kind nearly so much as monarchies. Mr. Streeter, however, thinks the diamond taste will have its day presently among the Americans, among whom the wealthy class have already developed so great a taste for luxury, and that the future of some of the great diamonds will be to pass into the hand of American millionaires in exchange for money which may be of more value to some of the present owners than the mere *débat* of possessing this or that diamond; and his surmise is not an improbable one.

#### PICTURES AT THE ROYAL ALBERT HALL.

As last year, so also this year, a considerable number of pictures which would have been hung at the Academy but for want of room, have found opportunity for exhibition on the walls of the gallery at the Albert Hall. Among them are some good works, including several which might very well have gained a place in the Academy instead of some that are hung there. Sir Robert Collier's "Rosenlan" is a fine, solidly-painted Swiss landscape, every part of which is conscientiously worked out, with no tricks of effect. Two sea-pictures, by Mr. H. Mugrave, "A Dangerous Coast" and "Mid-Channel" (7, 24), are admirable examples of sea painting; if we except a little bit of trickiness in the effect of sunlight on the near water, in the last-named of the two; but had these been well hung at the Academy they would have unquestionably attracted admiration, and we hope they will do so in their present position. Among others of the pictures sent under these conditions may be mentioned Mr. W. Sidney Cooper's "Evening on the Thames" (19), which is a good landscape; Mr. Stevenson's "Evening on the Seine" (6); Mr. Glen-

denning's "River scene, Sussex" (9), where the water is rather mannered in treatment, but the rest of the painting very good; Mr. Tomson's "Toby" (30), a picture of dogs, in which a performing dog with a collar is criticised by others of his race; Mr. Kennington's "The Sonnet" (52), a bit of old Florentine life; and Mr. Cuthbert Rigby's "Winter" (55), which is apparently a portrait, a three-quarter length of a lady in winter dress, with a decorative background,—a very pleasing work.

Among other works exhibited, which have not been submitted to the judgment of Academicians, is one by Mr. A. B. Donaldson, "Flight from the Dance," exhibiting this painter's usual feeling for tone and colour, and his careful and learned study of archaeological costume and accessories. The picture shows a party of nuns and others apparently escaping from a monastery, with as many of the sacred objects, shrines, &c., as they can carry away; their chance of escape is certainly small considering the proximity of the ship-loads of warriors with winged helmets. There is a great deal of expression in some of the figures, and the picture is probably a tolerably truthful recalling of a kind of incident that was very common in the early days of the history of this island. There are some nice bits of painting of less important subjects, and it is agreeable to meet again Mr. Story's very clever picture of the interior of the old Bath pump-room, which was at the Royal Academy some four or five years ago. There is a very clever work by Mr. A. Spring, "The Forester's Boy" (84). There are also some good architectural drawings, and among the miscellaneous collection of drawings and designs of various kinds is one of the very finest of Mr. Seymour Haden's etchings.

#### THOUGHTS ON MANY THINGS.

BY W. PETTIT GRIFFITH, F.S.A.

"The eternal laws of nature  
Can't be reversed by human creature;  
And what's immutable in frame  
Will through all ages run the same:  
Truth will be truth, and error error,  
In spite of sophistry or terror;  
And no smooth magic of the tongue,  
Can change the modes of right or wrong."  
*Oxford, 1720.*

HAVING before directed attention to the fact, that it was universally believed by the ancient philosophers that insects were spontaneously generated from putrefying substances,—an opinion now only maintained by uninformed persons,—and that we have no spontaneous creations of architecture, the importance of agreeing upon a standard of proportion and taste is self-evident. There is one grave reason in favour of creating a fixed standard for form and taste, viz., that the creation of the world was not spontaneous; and that the present animals, although their anatomical construction is eminently based upon utility, have in proportion and form undergone remarkable changes. The earliest remains discovered by the geologist, although as far as utility is concerned they were good, and answered the purposes for which they were created, still they were of huge and nameless forms, and of colossal dimensions; but now are represented by animals of comparatively inferior size and strength, although matured and more harmonious.

As perfection is but of slow growth, it has taken many thousand years to produce the perfected man, the animals, and the flowers. Such is the unity of nature, that it is difficult to determine where animal life begins and plant life leaves off. Also, to discern where reason commences and instinct ends; the human mind, which is instinct perfected, being the most marvellous.

There is no doubt that man, as well as other animals, was originally of an uncouth and colossal form, and in likeness resembled a gorilla more than the perfected man. Hence the uselessness of the geologist endeavouring to discover in the primitive rocks the skeleton or the petrified remains of the perfected race of man. The most polished nations that ever existed were originally barbarians, notwithstanding the fictions of Homer and Virgil.

The art kingdom has been, and is, passing through a similar evolution to that which Nature has been, and is still, undergoing; and from a simple beginning most beautiful and endless forms and colours have been and are being evolved. Such an operation, always in

progress in the past and the present, is destined to continue indefinitely.

In contemplating Nature's works,—the works of the creation,—one universal system should be attained. System is good, therefore all variety must be gathered into unity. If it be good on the small scale, it will be truer on the largest scale, including all elements. To treat of things detached and piecemeal, without connexion or proportion, must be radically and fundamentally erroneous.

To judge of the precise proportion awarded to the first man, and to each of all other forms at the creation, is difficult, unless the golden mean be appealed to for a decision; and as far as living objects are concerned, a tolerably correct conclusion may by this mean be obtained. To apply a mean to art-objects is absurd; buildings and their component parts are separately created.

Science by deduction demonstrates Nature's principles and indisputable laws. The study of science

"Is but to hold  
Converse with nature's charms, and view her stores  
unroll'd."—*Byron.*

Art perfects nature, "art being nature better understood." The knowledge of external nature was originally derived from observation; observation being the mother of natural philosophy. Bacon maintained that no philosophical truth or general principle could be obtained by any other method than by the induction of facts, or was entitled to acceptance, except in so far as it was supported by that testimony. The fundamental tenet, in short, of philosophy is announced in the opening sentence of the *Novum Organon*.—"Man, the servant and interpreter of Nature, understands and reduces to practice just so much as he has actually experienced of Nature's laws; more he can neither know nor achieve." The imitative arts have been considered in two points of view,—(1), imitations of such objects as are actually before the eye; (2), representations of those images which are formed by the fancy. The first is the mechanic or executive part of the art; the second, the ideal or inventive. Tully has justly distinguished those parts, when he observes that the Jupiter of Phidias was not drawn from any pattern in nature, but from that idea of unexampled beauty which the artist had formed in his mind. The perfection of the art consists in the union of these two parts; it is, in fact, nature methodised and made perfect.

The creation of a Government Department of the Fine Arts to classify and preserve historical monuments is feasible and practicable; but without a standard of taste, defining the good from the bad, the beautiful from ugliness, no Minister of Arts could exercise any authority. There is, however, one controlling influence (as set forth in the *Builder*, vol. xxxviii., p. 801), viz., to educate the people. The human mind can be taught, but cannot be enchained; we must,—

"Wait for the dawning of a brighter day,  
And say the chain this moment when you may,  
Nature imprints upon what'er we see  
That has a heart and life in it, Be free!"—*Cooper.*

Nature is more constant than fashion, and good painters never care for drawing people in the fashion, well knowing that the prevailing costume, although it may impart a grace to their present portraiture, will make a very odd figure in the eyes of posterity; hence the inducement for representing an illustrious person in a Roman habit, or in some other dress that never varies,—

"Vell'd in a simple robe, their best attire,  
Beyond the pomp of dress; for loveliness  
Needs not the foreign aid of ornament,  
But is, when undress'd, adorns the most."—*Thomson.*

The beautiful Medieval architecture is not to be repudiated because religion loaded it with ignorant superstitions, neither known to reason nor recognised by the early Christians. The past can be improved upon without being annihilated,—

"Can man do more than with nice skill,  
With firm and conscientious will,  
Practice the art transmitted from the past?"—*Goethe.*

Valuable as the British Museum is, as a receptacle and storehouse for all intelligence and the fine-art products of the world, it fails as an educational medium. The regulation, as far as regards the reading-room, that "no person under twenty-one years of age shall be admissible, except under a special order of the trustees," should be modified, as it may be



fairly allowed that the education of most young men is completed at the age of twenty-one years. Another abuse is, that persons under that age may be admitted by a special order from the trustees. If the British Museum be a national institution, which it is, the laws ought to extend to all persons, without private privileges. Eighteen years should be substituted for twenty-one years for admission to the reading-room, and special orders dispensed with.

The art of man, if not tutored by science according to the infallible rule of truth, is apt to run into excess and impropriety; and while it affects to be too fine and too powerful, becomes ridiculous. It is asserted that Queen Elizabeth took care by her injunctions that affectation, which spoils all other things, should not be permitted to spoil ecclesiastical music; and it has been observed that the music from the Reformation to the Restoration was more plain and solemn in its style than that which succeeded.

Nature teaches us to combine utility with ornament,—that which is beneficial as well as entertaining,—so as to mingle, in the constitution of things, what is pleasing to our imagination with what is serviceable to our interests. In all art-products a perpetual similarity of objects creates a cold disgust, as Shakespeare says,—

"Sweets grown common lose their dear delight."

Scientific analysis, guided by Nature and reason, can alone eliminate lasting truth. The true mark and proof of the certainty of any fact is the uniform agreement of all those who have written thereupon. In short, if we pursue reason and leave imagination, we shall then embody our thoughts and fix our opinions upon solid principles, as—

"Each rising art by just gradation moves,  
Toil builds on toil, and age on age improves."  
Colins.

We have been greatly indebted to manuscripts and medals for historical knowledge, more so than to some of the clergy, who in past times caused the destruction of many interesting monuments. In a copy of Willis's "History of the Cathedrals of Lincoln, Ely, &c.," sold among Dr. Stakely's books, 1763, was this note, quoted in the *Gentleman's Magazine*, 1802:—"In the beginning of 1753 the wicked chanter Dr. Trimmell, of his own authority, pulled down the eleven fine images of kings over the west door of Lincoln Cathedral to put up a foolish inscription of the names of the subscribers to the new iron rails."

The same was said of a dean of Lichfield, that, being whimsical or deranged, he fancied the kings who in two rows graced the west front of that cathedral would some time or other tumble on his head as he went in and out, and employed a chimney-sweeper's boy, at great hazard, to pull them down.

In 1804, intellectual inquiries calculated to shed a light upon and confirm history were often denounced. In "Rural Philosophy, or Reflections of Knowledge," the author says:—

"We sometimes meet with men, under the title of antiquarians, who rate things more by the character of age with which they are impressed, than by their real value; and who place their chief delight in the collection of old manuscripts or old medals, or other fragments of old time, which have nothing to recommend them but their rust and rarity."

A morbid taste may be acquired for ancient relics, neither useful nor ornamental, and to which, no doubt, Johnson alluded when he said, as recorded by Boswell, that "a mere antiquarian is a rugged being."

Archæology is of great assistance and importance to the architect: consequently to raise a smile at its expense, especially from students, is indefensible. The late respected Sydney Smirke, in his lectures at the Royal Academy, however, could not resist the temptation, when he said, "Utterly discard from your minds the bigotry of a mere antiquarian"; "but, above all, let us not be content to rattle the dry bones of antiquity, and fancy that it is music."

In the "Survey Archaeological Society's Collections," vol. v., credit is given to the Rector of Chaldon Church, Surrey, for preserving a large painting. It is stated that, "instead of leaving, as is too commonly the case, everything to the architect and his clerk of the works, he kept a watchful eye upon the proceedings, and catching sight of some colour peeping out beneath the whitewash, warned those employed in removing the latter, and thus preserved the painting." The importance of archæology is in this instance verified.

The laudable endeavours to expand the intellect of the Welsh people are even now frustrated by Paritalian attempts to ignore history and science. Huxley, Darwin, and Tyndall are looked upon with pious horror. It is not surprising, then, to find that, except in a few cases, science is not cultivated in Wales. The little demand for the arts of sculpture and painting is easily accounted for; such works bear a suspicious resemblance to the graving of images, and making the likeness of things which are in heaven above, in the earth beneath, or in the water under the earth. The superstitions of the ancient Britons, and their ignorance, have not yet been eradicated; although the habit of borrowing money of the people with a promise to pay in the next world, is not now credited.

It has been asserted that the "Druidical temples in Britain, while they bear the most indubitable marks of patriarchal antiquity, are so stupendous that a single stone appears a ruin; the design is so grand and magnificent, that the projectors must have been of the first-rate class of architects." The absurdity of the above is self-evident. The so-called Druidical temples, so long as they exist, afford specimens of the works of untutored savages or barbarians. The custom of carrying about, three weeks after Christmas, a small chest in imitation of Noah's ark, inhabited by a live wren, to remind the present generation that they are descended from Noah, is equally barbarous, although admirably commemorative of Noah's intemperance (see Genesis ix. 21), which example the inhabitants of Wales have studiously followed.

The religion of the ancient Britons has been the cause of the degradation of Wales. It may be easily supposed that the manners of the people took a tincture from the discipline of their teachers. True education is a development of faculties according to individual capacity and character. Amongst working people, the want of better means of recreation, and especially on Sundays, is an obvious disadvantage. How often a young woman with a taste for art, for books, or for music, marries a man who has no taste for anything but the public-house after his work is done. We have at last, however, prospects of a new era, education now being in the hands of the laity. The clergy, as a body, have always dreaded the march of knowledge, and viewed the progress of the human understanding with a jaundiced eye.

Thanks to the Legislature, we are provided with a Building Act, and, indifferent as it may be, it prevents many irregularities which the building world would undoubtedly perpetrate; and if a stringent Act of Parliament could be framed, regulating the building of new churches, and the restorations and alterations of our cathedrals and churches, it would be advantageous. It is true that rural deans have the power of inspecting churches within their own deanery, and of ascertaining necessary repairs, and recommending the same to the churchwardens; but rural deans have seldom that practical knowledge of ecclesiastical architecture which is requisite, and, moreover, they are greatly influenced by the clergy, who, generally speaking, have no practical, and very little other, knowledge of architecture, and often permit their sons, in combination with the country mason, to effect spoliations. Numerous instances could be named of so-called restorations displaying ignorance and appearing ridiculous to an educated eye. Where the ornamentation and mouldings have been defaced and mutilated, either by neglect or time, the proper method to restore is to seek examples of ornament and mouldings existing in buildings of the period analogous to the edifice to be restored, and this can only be done by an educated architect.

To remedy these evils an Act of Parliament enacting that rural deans shall require the diocesan church architects, or educated practical architects, to make surveys, and advise accordingly, should be provided; and further, that no clergyman or other person shall alter or add to any ecclesiastical edifice without the supervision of an experienced architect on behalf of the rural dean. We are often indebted to the clergy for raising funds for building new churches, and effecting restorations to old ones, and there is no doubt, upon reflection, that the clergy would not object to the realisation of this suggestion. No church, also, ought to be built without a lightning-conductor; in all cases science demands this. In many village churches, instead of putting the conventional cock on the spire, well known to the church architect, a

large, fat, spurred, and gilt domestic fowl is mounted, conveying to the mind an adjacent farmyard.

The highest aim of science is mere truth, which shines always the brighter for being opposed. Science and art show that in nature beauty and utility are combined in such unity as proves their source in one supreme mind,—creating, adjusting, and adorning. The shortest road in every art is that which leads through theory to practice. It is from theory that arises that great facility, by means of which a man advances the quicker, in proportion as he is surer of not taking a wrong step; whilst those who are not grounded in the science labour on in perpetual doubt.

Poetry has been considered a luxury; there is no doubt that two or three lines of poetry may convey to the mind a readier explanation than a page of prose. Still a philosopher would consent to lose a poet to regain an historian, for some future poet may arise to supply the vacant place of a lost poet, but it is not so with the historian. Fancy may be supplied; but facts once lost in the annals of mankind leave a chasm never to be filled.

Disraeli, in alluding to the pleasures derivable from the cultivation of the arts, sciences, and literature, says that time will not abate the growing passion; for old men will cherish an affection and feel a youthful enthusiasm in those pursuits, when all others have ceased to interest. Socrates learned to play on musical instruments in his old age; Cato, at eighty, thought proper to learn Greek; and Pitaroch, almost as late in his life, Latin. Theophrastus began his work on the "Characters of Men" at ninety. Colbert, the famous French minister, at sixty, returned to his Latin and law studies. Ludovico Mondesio, at one hundred and fifteen, wrote the memories of his times. Michelangelo preserved his creative genius in extreme old age; and there are many other instances. Dr. Johnson, when in his seventieth year, said it is from want of use, if a man's mind grows torpid in his old age.

Seneca says, "whatever be the amusements you choose, return not slowly from the body to the mind; exercise the latter night and day. The mind is nourished at a cheap rate; neither cold nor heat, nor age itself, can interrupt this exercise; give therefore all your cares to a possession which ameliorates even in its old age."

Books have been considered as the nourishment of the soul, or, according to Diodorus, the medicine of the mind. A student has in his books "the ruins of an antique world, and the glories of a modern one." Johnson said that a man's mind grows narrow in a narrow place, whose mind is enlarged only because he has lived in a large place; but what is got by books and thinking, is preserved in a narrow place as well as in a large place.

Analytical writers have divided genius into two kinds. The one belongs to the sciences, the other to the arts; the one is employed in the discovery of truth, the other in the production of beauty; the one addresses its discoveries to the understanding, the other its productions to the taste. Beauty has been defined as

"Heaven's most beautiful gift esteem'd."

But more concisely expressed by Shakspeare in "Twelfth Night,"—

"Beauty's a flower."

When the mind of an architect or other artist is stored with knowledge and teeming with imagery, he designs very rapidly, otherwise he will have to turn over half a library to make one design.

Some writers on Natural History have expressed astonishment at the rarity of finding a dead bird, and wonder what can become of the immense numbers that must necessarily die, and fall to the ground. Nature does not permit the air we breathe or the water we drink to be long poisoned or polluted, and it would not afford amusement, but impart great instruction to all sanitary boards to study nature's efforts to purify the air and water. The fact is, as has been before observed, certain insects perform the office of undertaker; attracted by the smell of the corrupting corpse, they hasten to the spot, creep beneath the body, and excavate a vault beneath it; and in this manner the lifeless remains disappear from the surface of the earth, until they are fairly buried. When the interment ceases, the undertakers regale themselves upon the flesh of the departed.



Nature, again, in a sanitary point of view, converts putrifying vegetable matter into manure. Darwin says the millions of leaves and other vegetable matter dragged by worms underneath the soil, whether passed through their bodies or not, form a splendid natural manure. This is interesting so far as the country is concerned, and proves that nature abhors putrefaction, dirt, and all impurities which destroy animal life; but in crowded cities, man, tutored by science, alone can introduce light, air, cleanliness, and consequently health, without which mind and body cannot possess a perfect development.

An excellent lesson may be derived, in a sanitary point of view, from even the life of an insect. If silkworms be kept in a close room, without ventilation, they will neither thrive nor spin. Hence nature, science, and art must be combined.

If, therefore, insect life cannot be sustained without ventilation, it cannot reasonably be expected that the health and lives of human beings can be otherwise than sacrificed without pure air, pure water, efficient drainage, and ventilation. It has been urged that overcrowded drawing-rooms become, for the time, as malarious as some of the worst abodes of the poor, and our public buildings, such as concert-halls and theatres, are abominably ill-ventilated, and, moreover, draughty.

Learning which tends to usefulness must not be undervalued; and, although the old philosophers were held in great esteem, and human knowledge was considered incapable of reaching higher than Pythagoras, Democritus, Plato, and Aristotle, still Socrates was the wisest of them all, because he reduced philosophy to the simplicity of common life, the most useful of all studies; whereas the speculations of the rest, however ingeniously imagined or agreeably expressed, are little better in reality than mere romances. Goethe, in "Faust," was also of this opinion,—

"I've now, alas! Philosophy,  
Medicine and Jurisprudence, too,  
And to my cost, Theology,  
With ardent labour studied through,  
And here I stand, with all my lore,  
Poor fool, no wiser than before."

The contrast between Johnson and Shakespeare, although well known, is very remarkable, and imparts a lesson in the great progress of civilisation. Johnson was a classical scholar at a time when knowledge was limited to the few. Milton and Byron's writings were also influenced by the classic school, and were by no means improved by it. Shakespeare, on the contrary, was Nature's scholar, and imbibed his knowledge almost solely from her works, consequently was free from the artificial, unscientific, and untruthful influences, dictated by the gross superstitious ignorance of former times. Johnson's taste was more sensual than artistic; Boswell, on several occasions, argued this matter with him, and his notes taken in France exhibit an ignorance of architecture when he says, "the cathedral of Noyon is very beautiful, the pillars alternately Gothic and Corinthian."

Johnson expressed his disapprobation of ornamental architecture, such as magnificent columns supporting a portico, or expensive pilasters supporting merely their own capitals, because it consumes labour disproportionate to its utility. His remark that a building is not at all more convenient for being decorated with superfluous carved work is more correct. At home and abroad, in ancient and modern times, it can always be said,—

"Distinguish'd men of every school and age,  
In due succession, all the mind engage."

Finally, the true golden age is this in which we live, that an Eden may be created here by our own efforts, and that the higher life is not idleness, falsely called independence, which is worshipped by most, but a life of productive industry, wherein plain living can be combined with high thinking; then it will be seen that art, science, and literature, on the rugged journey of life, scatter flowers and overshadow the path of the weary, and refresh the desert with their streams, and that they flourish only in their greatest beauty and perfection on the soil of complete mental and political freedom, realising—

"Fair creations, to perfection wrought,  
Embedded visions of ascending thought!  
Forms of sublimity! by genius traced,  
In tints that vindicate adorning taste;  
Whose bright originals, to earth unknown,  
Live in the spheres enrolling Glory's throne;  
Models of art, to deathless fame consign'd,  
Stamp'd with the high-born majesty of mind."

#### FROM THE BANKS OF THE SEINE.

It is scarcely, after an absence of a year, that the visitor to Paris can expect to find much change, even in a capital which, within a generation, has seen itself transformed in a fashion which, except in the New World, can hardly be said to have an equal. Whatever may have been the activity of the Second Empire, and the early years of the present Republic, within the last twelve months there have been no radical changes in the map of the French capital,—no new thoroughfare opened, such as the Avenue de l'Opéra and the Boulevard Saint-Germain, or the Boulevard Henri Quatre of a few years since. But there are numerous great works in progress; the building activity has in no measure relaxed; wagon after wagon laden with huge blocks of half-dressed stone, ton after ton of cement, pass daily through the gates of the city, and pay the heavy town dues; forests of scaffolding rise in every quarter, and dust and mortar covered jovial masons crowd at meal-times the innumerable *cabarets* in every direction. The modern exigencies arising from the universal admission of the truth of the proverb, that "Time is money," have overcome even the difficulties which formerly the seasons placed in the way of the builder, and protection against the elements once ensured by glass casings, work progresses as rapidly in the winter as in the summer. Palaces of stone, designed to last practically for eternity,—products of a system of tenure that wots not of short leases,—are rising in every neighbourhood, to accommodate a population which is yearly becoming more able to house itself comfortably, while the great public works keep pace with the activity of private enterprises and of the companies which of late have taken upon themselves to invest their capital in the building of what are understood in Paris as *maisons de rapport*, or, as we should say, "dats," which, from all accounts, our New York cousins have now commenced to build in large numbers, and more recently upon co-operative principles.

Foremost among the public works the Hôtel de Ville is rapidly approaching completion; and, since last we saw it, the building has been almost entirely freed from its scaffolding, and the general design can now be fairly judged. If from certain points of view the chimney-stacks are too prominent, the effect, as a whole, is imposing, and, seen from the Pont Neuf, the new Hôtel de Ville, though only a mere reminiscence of the original sixteenth-century work of the Italian Dominico Boccador, certainly forms, with its white stone pavilions and steep roofs, one of the architectural features of Paris. At the present moment the central motif of the clock,—a grandiose design to be surrounded, as in the old Hôtel de Ville, with allegorical figures,—is alone awaiting completion, and within a short time will, from all appearances, be uncovered. But the building, thus far advanced exteriorly, and a large number of the generously-distributed statues in their niches, there remains almost the whole interior to complete, and two years, at least, it is reckoned will elapse before there be any hope of the Paris municipality occupying their new quarters. Rumours have gone forth that, on the celebration this year of the great national *fête* of the 14th of July, a municipal banquet would be given within the building; but those who have seen the condition of the interior of the Hôtel de Ville can hardly believe this will be the case. The flooring is not even laid down, nor the painting commenced; and on the first story only the heavy work is completed. We learn that there are about 500 workmen employed at present, over 100 rough-casters, as many carpenters and joiners, and a large number of stone carvers. Progress is being further assisted by the use in the underground work of the electric light. But no energy will enable the Parisians to open their Hôtel de Ville before 1884. It is no small matter the re-building of so important an edifice, and the nine years that have elapsed since the works were commenced cannot be said to have been ill-employed.

Certainly there is not the same activity observed in the erection of the Hôtel de Ville, as is noticeable in the new Post-office. There, since our last visit, the works have progressed to an extent, considering the size of the building, that is truly astonishing; steam windlasses are whirling in every direction raising huge blocks of stone into their definite places, and now that the sturdy foundations are completely terminated, the upper stories are rising rapidly, and the

plan of the whole, even in the midst of an inextinguishable forest of scaffold-poles and joists, can be more or less traced. We spoke not long since of the general distribution of the building, which will certainly do modern Paris the utmost honour. It is not only the Post-office itself which is rising from the earth, but the whole neighbourhood, and several blocks of stone-built five and six story houses of approved modern type have replaced within a few months the broken-down antiquated gloomy hotels and lodging-houses which have occupied the district since the days, not so long since, when fashion deserted the Place des Victoires. In the Rue Bergère, the conspicuous building of the Comptoir d'Escompte, of which we have already spoken more than once, now forms one of the features of modern Paris, while its neighbour on the Boulevard, the huge central office of the Crédit Lyonnais, not content with its already grandiose premises, is enlarging these by important additions at present buried beneath a network of bewildering scaffolding. The well-known "Magasins du Printemps" (in the Boulevard Haussmann), which, it will be remembered, were burnt down about a year since, are progressing steadily towards completion, the use of the electric light allowing of the employment of double shifts of workmen. It is a characteristic sight to see in the darkness the effect of the brilliant light shining through the maze of scaffold-poles, rafters, and unfinished doors and windows, and the shadows of the workmen flitting about like so many elves.

In the Boulevard Saint Germain the new École de Médecine,—which occupies a site crowded with historic memories: in one of the houses demolished Marat was assassinated by Charlotte Corday,—is steadily progressing towards completion; the rising generation of medical students are indeed to be envied the new home that before long they will occupy, with its well-arranged lecture-rooms, museum, and other requisites to study. Though there has been a talk of enlarging the École des Beaux Arts, no steps have as yet been taken in this direction, nor has anything further been done to isolate, as has been urged, the Bibliothèque Nationale. Near Notre Dame the quay which replaces the site of the historic Hôtel Dieu,—of which, at the time of its demolition, we spoke at some length,—is slowly being completed; in the Rue Rivoli, by the side of the Hôtel Continental, the last gap in the long line of arcades stretching from the Rue du Louvre to the Place de la Concorde has at length been filled up, the site of the ruins of the Foreign Office, burnt during the Commune, being built over.\*

At the "West End," the district lying between the Champs Élysées and the Trocadéro is gradually filling up with huge private palaces and tall stone-built five and six story "dats," many of them erected by the insurance companies as excellent investments for their capital. The simpler style of architecture which is now in vogue makes these buildings exceedingly attractive features; throughout the architects have adhered to the general type with which all who know Paris are familiar. With a skill which merits praise, a diversity is insured,—even in the levels of the balconies, and certainly in the design of the *portes-cochères* with which every important house in Paris is provided,—that renders what might seem monotonous, agreeably varied. While the same type is retained in a long line, there is none of that sameness with which at home it is impossible not to find fault, when a new street or road has to be laid out; while of the interior arrangements with which the modern houses in Paris are now provided, it is difficult to speak too highly. The economy of room, the artful planning, the study of the conveniences which we now demand from the architect, and which, till within a generation ago in Paris were so lamentably neglected, merit, we have no hesitation in saying, the closest attention from the professional student. As is the case in the United States, each year marks a further improvement, not only in an artistic and decorative direction, but in the practical consideration of the requirements of modern existence, and that proper thrift which, combined with the due regard to luxury, is so marked a feature of French existence. The houses that are being built now in Paris are not such as the coming

\* It is in one of the houses in a quiet little street, No. 6, of the Rue du Mont Thoron, at the back of this new block of buildings, that the refined and romantic poet, Alfred de Musset, died in 1857, a house which the Paris Municipality have within the last few days determined to mark by a commemorative tablet.



generation will find "stuffy," "too small," "old-fashioned," and so on, criticisms which with us are commonly passed on the creations of the last twenty-five years; they are houses intended to last practically for all time; built of solid stone and iron throughout, with foundations that resemble Roman work, on the traditions of which, by the way, they are built by the sturdy Southern workmen. Commercially, also, these investments prove successful, and household property, so far from being a drug in the market, is at a premium. By the judicious division into "flats," not only is every inch of space utilised,—the amount of rent for unoccupied room in England it would be curious to calculate,—but all pockets are accommodated, from the prince who occupies the first floor, above the thrifty *concierge* on the *rez-de-chaussée*,—whose charge it is to open the door at night and keep, not only his or her own neat *loge* bright and clean, but the *porte-cochère* and the yard, with its pretty green plants and bright brass water-cock,—through the intermediate *étages* to the fifth or *cinquième*, with its healthy balcony, where the large family of the modest lodger can enjoy the air and view as a compensation for the sensible distance from earth. But all own in common, from the prince to the fifth-floor *employé*, bank clerk, or civil servant, the *porte-cochère*, through which rolls from the compact stables and coach-house in the yard at the back, the carriage of the "first-floor,"—and for all alike the entrances are kept clean, the lamps bright, the oak staircase well waxed; each in his respective and well-proportioned degree making up the very comfortable rental which *Monsieur le propriétaire*, through his agent, the *concierge*, receives quarterly from his tenants.

#### ART IN COSTUME.\*

COSTUME may be regarded philosophically from two points of view,—that of Health, and that of Art. With the former of these I do not propose to deal, except incidentally: our province is Art. The laudable attention now paid to sanitation might incline one to believe, perhaps, that the branch of the subject which we are about to consider is of inferior importance to the other; but however that may be, there is no doubt that it has the priority in point of age, for costume was introduced not from a care for health, but from a desire for ornament. The tales about savages who appear, shortly after the arrival of the white man, arrayed in all the simplicity of a top-hat and collar, have a foundation in fact, though many rashly suppose that they are only concocted by a feeble humorist. And it is only necessary to remind you that, in our own land, where we now find clothing indispensable to health, there lived, within the most recent times, geologically speaking, and under the same climatic conditions, a race of men who wore no clothing, but nevertheless gratified their love of ornament by a system of tattooing,—it is only necessary to bear this in mind, to realise that, with the savage, love of ornament is a stronger passion than anxiety for health.

That aspect of Costume, therefore, which relates to appearance is not without claims upon the attention of the greatest Philistine, and certainly ought to receive full consideration from us whose chief title to distinction from the rest of the building trade is that we cultivate the Beautiful and are inspired more or less with the spirit of Art.

I could quite sympathise with a plain matter-of-fact man who should come to me and say, "Don't trouble us about appearances; we are quite indifferent as to how we look, so long as we have clothes that will keep us comfortable and preserve our health"; and to such a person I should be inclined to reply, with words of assurance, "My good Philistine, you are not wholly devoid of sense; for, whatever may have been the original motive of clothes, their chief function now is to fulfil the behests of comfort and decency; and the object of a treatise on 'Art in Costume' is to show how comfort and decency may be combined with beauty." The sensible Philistine would then very naturally reply, "Comfort we know, and Decency we know; but what is Beauty? and what,—especially what,—is Art?"

What is Art? Art is much more closely allied to common-sense than is generally supposed, even by architects. There are many plain people who are quite overawed at the

\* A paper by Mr. J. A. Gatch, read before the Architectural Association on the 19th inst.

sound of the word. "What do we know about art?" say they. "No, let art be to them that understand it." There are not a few, on the other hand, especially in these days of "intensity," who believe that they do know all about art, and exhibit their familiarity in such wonderful ways as to imperil the reputation of their goddess. If all these worthy people would bear in mind how nearly related is art to common-sense, they would cease to treat her with such hopeless respect on the one hand, and such impertinent familiarity on the other. For the purpose of this paper, Art may be briefly described as "Common-sense made beautiful."

To define what Beauty is, is much more difficult. There is no such thing as absolute beauty. Beautiful is a relative term. What is beautiful under some conditions ceases to be so when the conditions are changed. What is beautiful to one person is ugly to another. Nevertheless, within certain limits we find that a majority of tastes agree, and that a broad standard of beauty has been established just as a broad standard of honor or of morals has been. One of the essentials of beauty is fitness, and on this, at any rate, we are competent to form a judgment. In matters of dress, as well as many others, fitness is a sure resting-place. Is everything suitable? Does everything fulfil its purpose? If so, the rest may well be left to the taste of the individual. If not, true beauty is incompatible with failure in these essential elements.

The two main principles, then, upon which all costume ought to be founded are,—(1) Comfort, (2) Beauty. I place comfort before beauty, inasmuch as, paraphrasing the lines of a living poet,—

"Beauty is a steep that few can climb,  
But comfort is a path that all may tread."

Every one knows when he is comfortable, but every one does not know when he is beautiful. If beauty and comfort clash, it is beauty that must give way; but there is generally a means of attaining both, and the art of costume is to do so.

The object of this paper, I may say at once, is not to insist upon ideals, but to examine and criticise our present style of dress, and to suggest certain alterations which might easily be made; some of these lie in any one's power to carry out, while others would almost necessarily have to await a further ripening of opinion, inasmuch as good taste forbids our making ourselves wilfully conspicuous. It will be necessary to illustrate a number of points by referring to the great store-house of History; but, except by way of illustration, it is not my intention to weary you with historical details.

One of the fundamental rules of architectural art is that the exterior treatment shall indicate the interior arrangement, and an ideal costume would follow the same lines. If, therefore, I were insisting upon an ideal costume I should have to call your attention at the outset to this, that whereas male costume admits the fact that human beings have two legs, female costume conceals it; and I should then have to urge upon your acceptance what an American society designates as a "garmenture of a dual form" instead of the prevailing skirt. That such a garment could be defended on historical grounds, as well as on those of convenience, comfort, and beauty, avails nothing against prejudice. The one sufficient answer to the advocates of this dual form is that women find they can do their work better in skirts. That being so, nothing remains but to see how we may improve the existing dress and leave these ideals to take care of themselves. For it must be remembered that costume is not a matter of conscience, but convenience; and however deeply we are convinced that some other arrangement than the present would benefit mankind and womankind, we need not make martyrs of ourselves, but may without sin bow down (undoubtedly under protest) with the rest of the world to the arch-fund, Conventionalism.

I have called Conventionalism an arch-fund, but I would not maintain that he is so always. Sometimes he is of great assistance to us, and he is certainly inevitable. It is only when he is blindly worshipped that he assumes his devilish guise. He is a good servant, but a bad master; and not only in Costume either. In all relations of life, whether daily, political, or religious, a blind worship of conventionalism stifles Thought, and Thought is the breath of the world. If, therefore, in matters of costume we enter into his temple, let us be careful to keep near the door lest the incense numb our faculties.

Let us now turn our attention to the costume of the present day, and see how far it is founded on right principles. Comfort and beauty have been laid down as the two main objects for which we ought to strive. How far do we attain to either of them? In male costume I believe there has never been a time in which, on the whole, comfort and convenience have been so cared for, and there never has been a time in which beauty has been so conspicuously absent. In female costume I cannot pretend seriously to judge either as to comfort or convenience; but from the length of time necessary for the toilette, I should conclude that convenience is not much studied; while from such experience as I have had in wearing petticoats (in connexion with the drama in my youth) I cannot recommend them for comfort; but then I was not brought up to them. In the matter of beauty, ladies have undoubtedly the best of it,—I mean in costume,—and there is no reason why in the present day they should not, with a little care, be as suitably and gracefully dressed as at any period of the world's history. When we look back a few years and remember the chignon, or a few more, and recollect the crinoline, it is really astonishing what strides we have taken in the right direction. What we have to do is to realise in what this improvement consists, and to take care that we plant ourselves so firmly on the solid ground of Art, that the next turn in the wheel of Fashion shall not whisk all our improvements away. Not that we need blindly condemn fashion, and be always "out of it"; but nothing can be feebler than blindly to follow it in defiance of the dictates of common-sense and beauty.

Before bringing our standards of fitness to bear more in detail upon modern dress, it will be necessary to define a little more accurately what we understand by comfort, and to indicate in what particular directions we must seek beauty. By comfort, then, we mean that dress must be useful in all its parts, with no needless and meaningless excrescences; it must allow free play to all the limbs, and to all movements of the body; no part must, by dangling about, or otherwise, interfere with the work of the wearer; it must be easy to put off or on, must be adapted to the weather, must be in harmony with all modern requirements, and must be economical. In the search for beauty we must bear in mind that it may consist both in form and colour; the colour will naturally depend upon the taste of the wearer, and cannot be rigorously defined: the form,—and in this we shall find the costume of the present day defective,—the form should be strictly founded upon the figure; that is to say, all the leading lines should have their origin from some exigency of the figure, and not be obviously manufactured. They need not follow the lines of the figure, but they ought to harmonise with them. There is nothing more beautiful than the natural human figure, and therefore to spoil it by tight-lacing, or by high heels or artificial humps, as was the fashion in the days of the departed "bustle," or by any kind of stuffing, padding, or meaningless excrescence, is contrary both to common-sense and art. Another element of beauty, which is too frequently overlooked, is simplicity. Finally, we must always remember that construction may be ornamented, but ornament should never be constructed. This constructing of ornament, this piling-up of decoration for its own sake, in defiance of comfort, has been a very wide-spread evil. Its wildest extravagances have, perhaps, been lavished on the hair, and reached their limit some 150 years ago, when coiffures were so elaborately constructed that they were preserved untouched for three weeks; the foolish martyrs to fashion sleeping meanwhile as best they could.

Having thus obtained a general idea of what we ought to strive after, and what to avoid, let us examine some examples. The first to which I will draw your attention is from a Greek vase, and is given in "Hope's Costume of the Ancients," plate 120. It represents Electra in mourning for Orestes. Here we see some of the essential principles carried out. The undergarment fits close to the figure, while the outer garment derives its folds from the exigencies of its position on the figure. The next two examples are fourteenth-century costumes, and show how it is possible to obtain a beautiful dress without having recourse to flounces and loopings and absurd fringes. They are by no means faultless, especially about the head, but the dresses have the merit of fitting the figure and depending



up in natural causes for their folds. My next example is a specimen of what should be avoided. The whole dress looks like a travesty of costume. The figure is spoilt by its tight waist, is disguised by the fantastic and bunched dress, which has scarcely a natural fold about it. The hat is absurdly large and overloaded with ornament; the shoes are ridiculously small and high-heeled. Throughout the dress there is no repose, everything is *bizarre* and inartistic, which is not a matter for wonder when we know that the date is 1782. The next is an example of male costume at the close of last century, when we see the first step towards modern trousers. The next three are recent examples from the pages of *Punch*. The man's costume in one of these is ridiculous, but the others are quite bearable, and one of them is actually graceful. Their beauty springs from the fact that the general outlines of the dresses follow the figure, there is no attempt at distortion, no desire to make the wearers look like either a wine-glass upside down, or a camel; the human figure is considered good enough for the purpose. That is a very important point, and if we can only realise the eternal fitness of it, we shall never be troubled again with crinolines, "Grecian bends," and similar abominations.

The treatment of the hair in one of these pictures from *Punch* is excellent. It is simple, natural, and graceful. The fringe is a matter of taste, as also is the exact finish at the back; but the excellence lies in the way in which the shape of the head is shown, and in the absence of constructed decoration, padding, obignon, and other nasty excrescences. The collar or frill is pleasant, too; and it is worth noting, *en passant*, that a good deal may be expressed by the "lie" of a collar, from the soft, coquettish frill, to the stern, spreading, white collar, suitable only for some of those severe pastimes which pass for business with the fair sex. The details of the dresses are less happy. As a rule, you will find the upper part treated well, the bodies fitted to the figure, and the sleeves sensible; but in the skirt we meet the chief defects which can be charged against modern female costume. All this looping-up and tying-round, all these flounces, and frills, and pleats, and bows, are radically wrong. Why? Because they are unnecessary,—indeed, often inconvenient,—and they are in direct violation of the rule that all the leading lines should spring from some exigency of the figure. Now these do not; they are added from an unwholesome desire for effect, and the effort obtained is more than offset by the effect of the *trifling* and the *excessive*, it is complex.

Folds in themselves are admirable, are indispensable. The beauty of pictorial costume lies in folds; but the folds must be judicious, and ought to spring from natural causes, and not be heaped up *ad nauseum* by a dressmaker, who wants to cram as much stuff into the dress as she can.

Compare a dress of this kind with that of one of Du Maurier's æsthetic girls. It will be at once evident that, however, in the latter case, the whole figure is overdone in its "intensity," the principle upon which it is draped is correct, and the effect of the folds (not of the *trifling* and the *excessive*) is more pleasing than that of the flounces in some of the other examples. The sleeve presents a difficulty. If too loose it gets in the way; if too tight it is uncomfortable. A mixture of the two resulting in great knobs at the shoulders and the elbows is ugly. If the sleeve can be tight from the wrist to the elbow it will display some of the most beautiful curves in the human body, and these curves are still more fascinatingly displayed if circumstances allow a wide, short, and open sleeve. The thinner the stuff of which the sleeves are made, the better to their inevitable wrinkles become, and there is no reason why the sleeves should not be made of thinner stuff than the rest of the dress, if judiciously managed.

There is room for improvement in the finishing of sleeves at the wrist. Frills are all very well, but they are artificial, and are merely tacked on as ornaments, being no integral part of the costume, *e.g.*, in the way that shirt-cuffs are. Facing, whether of velvet or a different kind of cloth, are feeble in conception and poor in effect. A more artistic and reasonable finish would be to turn under the end of the sleeve, which must be done to prevent its fraying, and then, instead of just stitching the two thick-nesses together, to work them together with an ornamental pattern, whose variety need only be limited by the invention of the maker.

The subject of bonnets and hats is one to be

approached only with the utmost circumspection: for the bonnet is to a lady the focus of her costume,—the very heart of her mystery. It has long been regarded as the most essentially feminine article of her dress, that on which man is incapable of forming any opinion worth the breath expended in uttering it. The fact is, that in this particular matter, feminine taste, or, let us say, dressmaker's taste, is a law unto itself. Anything they choose to decree shall be done. The bonnet is manifestly subject to no known law of nature, therefore, if they will, it shall be a flower-bed, or a bird's-nest, or anything else that is furthest away from the simple notions of barbarous man; it shall protect the chignon in preference to the head, or it shall act as a bridge between the two, and be, do, or suffer, whatever the caprice of the moment may dictate.

I beseech the bonnet-maker to pause and think. Caprice has no place in true art. The laws of art are eternal and immutable, but the method of embodying them may vary as fashion dictates. It is not so much fashion that does harm as the blindness and caprice of fashion. Is not a covering to the head recognised as necessary by all the civilised world? And if you choose to call that covering "bonnet," does that exonerate you from designing a bonnet in a manner most suitable to a covering for the head? Vary the shape as you will, but remember that the reason the bonnet exists is that it may protect a head. When you have satisfied yourself on this point, trim it according to your taste. If your labours invariably result in what you would call a "hat" and not a "bonnet," what then? It will only show that in so far as a bonnet differs technically from a hat it is indefensible, and bonnets must be discarded in favour of hats. If the result of your labours comes under your definition of a bonnet, so much the better. What I want to insist upon is that your work must be designed and ornamented on intelligible principles. Your construction may be decorated, but your decoration may not be constructed.

Let it not be forgotten that in trimming, or, as I should rather call it, decorating an article of dress, artificial flowers are inadmissible, so are stuffed birds, whether artificial or not, so also are bows.

Artificial flowers are inadmissible because they seek to deceive; they endeavour to persuade people that they are real. Utterly is the sworn foe of art. "It is not very wicked," you may say, "to wear a false flower; it harms no one, and often supplies a very needful piece of colour." To this I reply that there is no reason why you should not have the colour: as a rule, our dresses are too devoid of colour; but colour introduced in a false fashion does but aggravate the falsehood. Wicked, of course, it is not to wear false flowers, judged from a moral standpoint; but, judged from the standpoint of art, it is wicked, inasmuch as one of the very first demands of art is for truth. Conventional flowers worked on a dress or elsewhere are quite admissible, because they profess to be nothing but an ornament, and it is patent that they can be nothing else; but flowers stuck in the hat are a delusion.

Still more indefensible is the practice of wearing stuffed birds. It is conceivable that one might pluck flowers and adorn oneself with them; but it is not conceivable that one would hang dead birds about one's person. Birds, as birds, in distinction to feathers, have no business in our costume at all.

Then there are the bows. A bow is primarily an ornamental way of tying two ends of ribbon, and it is, therefore, a violation of truth to have a bow where it has not and cannot even be supposed to have, any such purpose. To manufacture bows, and then to stick them sporadically about a dress, or a hat, or anywhere else, is both false and feeble. The usual defence is set up that they are for ornament and colour. I say that ornament so feebly conceived is no ornament, and colour so crudely applied is an eyesore. If you must have ornament choose some other form than that which is devoted to expressing a particular way of uniting two ends of ribbon. It is mere laziness and lack of invention which leads to the ornamenting of dresses with false bows.

It may be urged against me that while I am very ready at tearing a dress to pieces, there is no such alacrity displayed in inventing something to take its place. Very likely: I am neither a tailor nor a dressmaker. I am a mere signpost, and a signpost would be neglecting the

very object of its existence if it were itself to go along the road to which it points others. But as a matter of fact, there is so much that is good in the costume of the day, and many of the defects are so easily remedied, that novel constructive suggestions are not much needed. Some of the hats now in vogue are beautiful, and the prevailing style of arranging the hair is admirable in many respects. Dresses are quite capable of easy improvement by simplifying the skirt and taking more care of the ornamentation. Worked borders offer a wide scope for the display of taste and ingenuity.

Much more advantage might be taken of difference in texture than is now the case in choosing materials. The large cloaks with fur-lining are excellent; and so, in some respects, are n'eters; but avoid false hoods as strictly as falsehoods. The dummy hoods, made only for show, and lined with a patch of blazing colour, are very despicable. At the same time, rich colours might very well be more abundant than they are, only they must be used with judgment and contrasted with taste. Indeed, the final arbiter in dress must be individual taste; and real art will never reign so long as every one meekly follows the fashion. Every lady should think for herself, should (as it were) make a study of herself. The graceful and the graceful, the thin and the fat, the tall and short, cannot all wear the same kind of dress with equally good effect. But by giving the matter careful attention and frankly recognising her own peculiarities, every one might become a walking work of art; we should see greater variety, more ingenuity, and less of that thoughtless fetish worship which is the most alarming feature in costume. True, the fetish at this moment is not so barbarous as in the past, but what guarantee have we that he will not again lead us into deplorable extravagancies, unless we thoroughly comprehend the great truths of which he is the distorted image, and resolve to be guided by them individually instead of meekly accepting the interpretations of the fashion-mongers?\*

#### "GREAT PAUL" ON HIS PROGRESS.

"GREAT PAUL" has shown considerable reluctance to charm London with his sonorous voice. His journey towards his cathedral home has been slower than one of those royal progresses which his march brings to mind. On the 17th of May he only advanced 100 yards towards London, and half this distance on the following day. Had the event occurred 600 or 800 years ago, when such a bell might perhaps have been cast, but when no Brindley, Telford, Macadam, or Stephenson had arisen to make plain the way for its transport, it would by this time have crystallised into legend; and a church of St. Paul *extra muros* would have probably arisen over that spot near Fenny Stratford where the wheels of the trolley that bore the great bourdon were, for a time "all but buried in the clay soil."

Far be it from us, however, to laugh at the trouble of the founders. The bell, from the best accounts, is a noble one, and it is especially natural for one who, like the writer, was born under the very shadow of the dome of the metropolitan cathedral, to desire to hear an external voice, of tone fit for the grandeur of the structure, sound forth from the belfry. By why was the risk of sending the bell by road incurred? It must be remembered that there is a distinct limit as to the size of the largest article that can be conveyed by railway—a limit which may be stated at about 10 ft. 6 in. in each dimension. But surely there is also a limit to the proper weight and bulk of transportation by road. On the last occasion on which we called attention to the public inconvenience caused by sending enormous structures drawn by traction engines on the ordinary roads, we incurred the wrath of a contemporary. Notwithstanding that, we must be permitted to say that such a practice is distinctly retrograde, and attended with cost, with inconvenience, and with danger. It is one which would have been impracticable before the abolition of the turnpikes, and of which, in consequence, the propriety has never been discussed. It is, we think there can be no manner of doubt, objectionable for many reasons.

It may be urged that the utmost saving which can be effected by the use of an iron

\* To be continued.



railway is known, that it affects road friction only, and that it effects a saving, as to this element of resistance, of perhaps five-sixths, which is capable of exact valuation; while the more important element of the resistance of gravity is unaffected by the improvement. That is true; true, that is to say, as compared with a good ordinary road. But what is left out of sight is, that while the facilitation afforded by the rail is definite, and cannot be increased, the amount of obstacle which may be incurred by the absence of the rail is capable of almost infinite increase. On a well-made Macadam road, in good condition, the resistance to traction on the level is about 45 lb. per ton. But this resistance rises rapidly with the deterioration of the road. On a gravel road laid on earth it is 140 lb. per ton; and in a case in which the wheels of a truck sink up to the axle, it is difficult to say what is the proportionate resistance.

Now, Great Paul weighs some 17 tons; the truck which carries him can hardly be estimated to weigh less than 4 tons. If this weight is put on four wheels, even if they were 18 in. wide, we only obtain some 72 in. of bearing surface, except by the depression of the road, so as to enable more of the circumference of the wheels to rest on it. But we thus get an initial pressure of 0.3 ton, or 672 lb. per square inch of road, or 6 cwt. per inch of this enormous tire, being 1.5th more than the allowance of Sir John Macnial. In fact, we are close upon the crushing resistance of ordinary brick, and the least lurch or inequality that would throw more than its fair share of weight on a single wheel would produce that crushing weight. Was it either wise for the transporters, or fair to the maintenance of the highways, to expose them to such a destructive action?

It has been answered by a contemporary that the bell could not be sent by railway, because its weight was too great for the works of any railway to support! Of course, the founders of the bell made no such mistake as this. Locomotives of more than twice the weight are used for express trains, and the weights on their driving-wheels are often far more than nine tons per pair.

We have not before us the exact dimensions of Great Paul, but we think that, if within the limits above stated, they are yet, no doubt, such as to require the construction of a special truck to allow, if carried by rail, of passage under the bridges. As to water carriage, we are not aware of the exact state of the communication with Leicester; but the Grand Union Canal runs through that town, and affords, we should have supposed, or ought to afford, the more convenient route for the transport of such an object. At all events, if it does not, it would be doing a public service, especially at the present time, to point out what hindrances exist to the performance of its proper function by this ancient line of inland transport.

Of course, the founders of the bell could have no object but to send their fine casting to its destination by the mode that would be at once the safest and the most economical. It is, therefore, of no small service to the bell-founder, the builder, the architect, the tradesman who deals with objects of great weight and bulk, in whatever materials, to understand clearly the limit which weight imposes on a transport by common road. And it is of no less importance to these persons, and to all the rest of the industrial public, to know what are the limits as to size imposed on our means of transport by rail and by canal. As to the road, if we allow 5 cwt. per inch for four 9 in. wheels, we have a weight of 9 tons, which we take to be the extreme load permissible for the ordinary road. As to the other routes, we shall be glad if these remarks elicit any information.

We are glad that the struggle with the soft place near Fenny Stratford has been overcome, and that the successive arrival of Great Paul at Dunstable and at St. Alban's was welcomed (like Jumbo by the smaller elephants in America) by the voices of the local bourgeois. We wish all success to his final ascent to his home, whence we hope that his voice will have been heard by the time that these remarks are in the hands of our readers. It will be inaugurating, let us trust, the commencement of a public service of many centuries if the journey of the bell leads to the clear determination of the true conditions of the inland transport of objects of colossal size and weight.

# THE ABC OF THE ELECTRIC LIGHT.\*

## ELECTRO-MAGNETISM—MAGNETO-ELECTRIC MACHINES—STORAGE OF ELECTRICITY—ARC AND INCANDESCENT LIGHTS.

In the year 1819 a Danish electrician named Oersted discovered that when a wire connecting the producing and collecting plates of a galvanic pair was passed over a magnetic needle, the current passing through it immediately deflected the north end of the needle, either to the west or east, according to the direction in which the current was passing. The following diagram

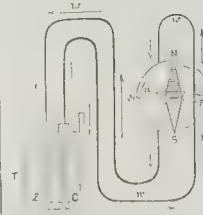


FIG. 4.

will make the matter clearer. T is the usual trough holding dilute sulphuric acid and the ordinary copper and zinc plates, C and Z. The connecting wire, w w w, which, in this figure, is represented as being continuous, passes first over and then under a mariner's compass, N E S W, the current taking the direction shown by the arrows. The dotted lines on the dial of the compass show the position of the needle as long as the current is passing. If we remove the wire and replace it by a bar-magnet with its north pole pointing to the north, exactly the same result will ensue. If, on the other hand, we dip the current-carrying wire, w w w, into some fine iron filings, they will adhere to it; in other words, a wire with a galvanic current passing through it has, to all intents and purposes, many of the properties of a magnet.

If, instead of the current passing up in front and down behind the compass, we arrange the wires so that it passes down in front and up behind, the compass-needle will swing to the east instead of the west. Every time that the connecting wire passes before and behind the compass needle, the effect of the current on the latter is increased, so that if a very delicately-hung needle is set to swing in the middle of a flattened spiral formed of many thousands of turns of fine wire, we have an instrument by which we can measure infinitesimal quantities of electricity. In such an instrument, the wire is covered with fine silk to prevent the electricity from passing from one turn to another. We thus have a ready means of knowing not only when a galvanic current is passing through a wire, but also of knowing in which direction it is going. The wire through which a current is flowing, if wrapped round a soft iron bar in a spiral form, immediately transforms it temporarily into a powerful magnet. Fig. 5 shows

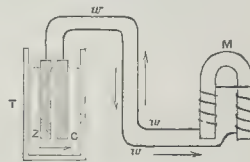


FIG. 5

how this is effected in the case of a horse-shoe electro-magnet.

T is the trough containing Z<sub>1</sub> and C the zinc and copper plates, and w w w is the closed conducting wire which passes round the two legs of a soft iron horse-shoe, M, which it temporarily converts into a very powerful magnet. In practice, the legs are covered with several layers of coiled wire protected by silk or cotton. The horse-shoe need not be made in one piece, but may be formed of two straight cylinders of soft iron united by a flat piece of the same metal firmly screwed into each leg. Such magnets are used in the construction of electric bells, and are the foundation of every machine connected with the production of current electricity by motion.

We see thus far that by using certain contrivances of a not very complicated nature we may convert galvanic or current electricity into

magnetism. Having proved this fact to himself from numberless experiments, it entered into the great mind of the illustrious Faraday that if we can convert galvanism into magnetism, we ought to be able to turn the tables, and convert magnetism into galvanism, and experiments soon proved the correctness of his supposition; for he found that by simply moving a magnet in close proximity to a coil of wire, part of which passed before and behind a compass-needle, a galvanic current was produced which caused the needle to swerve one way when the magnet approached the coil, and the other way when it was moved away from it.

This is shown in fig. 6, in which C represents a coil of wire with the united ends passing before and behind a compass N E S W. s m n is a bar-magnet, n being its north pole. Now, when

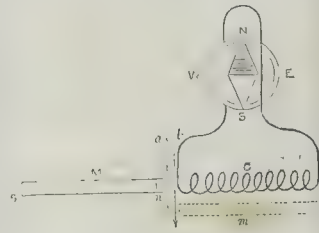


FIG. 6

M is passed before the opening of the coil C in the direction of the arrow a, a momentary current is set up in C, which, passing, let us say, before and behind the compass-needle, causes it to swing to the west. When the magnet is moved back again in the direction of the arrow b, another momentary current is set up, but in the contrary direction, swinging the needle to the east this time. If the magnet is thrust into the coil, and withdrawn, the same double effect takes place, or if it is moved into the position shown by the dotted line, and taken away again, the same double current is generated; in fact, almost any double movement of the magnet in close proximity to the coil will create a backward and forward current. Exactly the same thing happens if the magnet is kept stationary and the coil is made to move. It was further found that if a soft iron bar were inserted in the coil C, the effect was all the greater.

Figure 7 shows a magneto-electric arrangement in which a horse-shoe magnet, N S, turns upon an axis, C, in either direction, as shown by the arrows. L R is a horse-shoe of soft iron, the two legs of which are surrounded by a coil of wire, the rest of which passes before and behind a compass in the usual way. Now, when N S is rotated it is clear that N and S pass both L and R, and on each occasion a double current is produced. Now, let us suppose that instead of only one iron horse-shoe we have ten arranged concentrically round the centre C, and that we have also ten horse-shoe magnets arranged radially like the spokes of a wheel, and revolving several hundred times a minute, we evidently have the power of creating a very intense current. In practice, instead of only a single coil of four turns being wrapped round the legs of the soft iron horse-shoe, the wire, which would

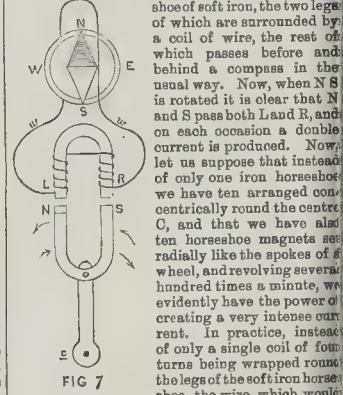


FIG. 7

be covered with cotton or silk, would be wound round each leg in several layers as closely as possible, so as to form a large number of rings, all wires from the ten left legs being joined together, those from the right legs being also joined. We have said before that it did not matter, as far as the principle went, whether the magnet revolved on the iron horse-shoe, with its coils of wire on each leg, so in most machines, such as that of the French Alliance Company, the coiled iron magnets are made to rotate. One of these consisted of an iron axle rotating in a suitable framework. On this axle were strongly keyed six brass discs, upon the circumference of each of which were fixed sixteen coiled soft iron horse-shoes. Around these were six sets of eight

\* See p. 603, ante.



fixed magnets arranged radially. Thus there were ninety-six iron coiled horseshoes revolving in close proximity to forty-eight permanent magnets at a rate of 400 revolutions per minute. Now, as the leg of each permanent magnet passed sixteen times before a coiled horseshoe at every revolution, sixteen changes of current were made during that time; that is to say, 6,400 in a minute, or over 100 per second, producing an amount of electricity capable of maintaining a very brilliant light between two carbon terminals. Such machines as these answered their purpose as far as they went, and were used both in England and France for the purposes of lighthouse illumination. They were, however, far from perfect, and very cumbersome, and soon gave way before what are now called dynamo-magneto-electric machines, or, shortly, dynamos, in which permanent magnets are entirely dispensed with.

It occurred to Dr. Siemens, Sir Charles Wheatstone, and, indeed, to several other electricians, almost simultaneously, that as an electric current passing round a bar or horseshoe of iron produced a magnet, if the wire *in* fig. 7 were passed round the permanent magnet N S it would increase its power, and that the power of N S being thus increased, the power of L R would also be increased, and so on almost *ad infinitum*. Experiment proved the supposition to be correct, for at each turn of the machine the power increased until both L R and N S would hold no more magnetism. At first sight this looks like a creation of force, but it is not so; for if we were to turn a hand-machine of this kind we should find it necessary to exert additional muscular power at each revolution, such muscular power being converted into electrical force. In accordance with this principle, most of the machines now in use are constructed without a permanent magnet, their place being taken by soft iron horseshoes, which, having been once touched with a permanent magnet, retain an infinitesimal charge of magnetism, which, however, is quite sufficient to begin with. In some cases it is not even necessary to touch these iron horseshoes with a magnet, as they contain sufficient magnetism, either from lying in the direction of the magnetic meridian,—that is to say, nearly due north and south, or from a small amount of magnetism being imparted to them during the process of forging. The idea of making the electric current react upon the permanent or temporary magnets which originated it, and so increase it, and the resulting abandonment of the use of permanent magnets, which were always getting weaker, necessitating continual remagnetising, have done more for rendering the electric light practicable than perhaps any other of the numberless inventions which have astonished the electrical world during the last five-and-twenty years.

Another great step in advance was the Gramme ring, which is the foundation of the dynamo-machine bearing that name. The machine which we have already considered gives currents alternating in direction as each leg of each magnet approaches and quits each leg of the coiled horseshoes, but the Gramme machine gives a continuous current in one direction only. The Gramme ring in its simplest form consists of a ring of soft iron of circular section, as shown fig. 8, *s, o, n, o*, surrounded by a continuous coil of covered wire not shown in the figure. A bare ring is cut through this covering right round the circumference, so that two conductors, *c, c*, may, so to speak, wipe against the bare metal of the coil at *o* and *n*, and so convey the current to the place at which it is wanted. The coiled ring is rotated rapidly in the direction of the arrows, and the strongest magnetic points of the ring, namely, those at *s* and *n*, where it is in close proximity to N and S, continually changing as it revolves, a continuous current is produced in the coil of wire, which is carried away by the two conductors *c, c*. In practice several coils are wound round the ring, and stationary soft iron bars are used to generate the current by virtue of the in-

finite amount of magnetism contained in them.

In the Brush machine, which is a skilful attempt to improve on the Gramme, the ring is made with a series of depressions, within which a number of separate coils are wound: thus the ring is only partially covered with the wire coil, and not wholly enveloped, as in the Gramme. The name of this machine is taken from that of the inventor, and not from the metal brushes which are used to collect the electric current. The generating ring turns at the rate of from 800 to 1,650 times in a minute.

In the Siemens machine the revolving coil is wound lengthways on a cast-iron cylinder, somewhat in the manner in which silk is wound on a netting-needle, the covered wire passing through two holes bored for the purpose, and lying in two longitudinal hollows cut in the iron.

London's machine consists of ten coiled cylinders arranged like the spokes of a wheel, revolving between the legs of a couple of soft iron pillars, coiled with several layers of covered wire. The current produced is led to a distributing machine, consisting of ten coiled cylinders fixed radially on a revolving shaft, which works inside a hollow drum containing the same number of coiled soft iron cylinders fixed to its inner surface.

It would be impossible to explain in detail the whole of the various machines at present in use, suffice it to say that they all work upon the same principle.

When sticks of carbon are attached to the wires connected with the generating and collecting-plates of a galvanic battery of, let us say, ten pairs, in the same way that the three pairs are connected in fig. 2,\* and the two pieces of carbon are united, the current will pass. If they are now separated a certain distance the current will still pass, but it will carry with it a stream of highly luminous particles of carbon, forming what is known as the galvanic arc. For some reason that has never been explained, the carbon from which the current is proceeding,—that is to say, the carbon connected with the receiving-plate of the battery,—is consumed very fast, while the carbon in connexion with the generating-plate of the battery is acted on only very slightly. For this reason alternating currents are used when dynamo-machines are employed, so that both carbons burn away at the same rate. Carbon rods burn away at the rate of about 5 in. an hour, and if some contrivance were not used for keeping the consuming ends at the proper distance from each other, the current would cease. Before the invention of the numerous dynamo-machines at present in use, batteries of fifty cells and upwards were used for generating the electric light, but at the present day, except under peculiar circumstances, dynamo-machines are almost exclusively used, as being cheaper and less troublesome. The carbons themselves are made of powdered gas retort deposit, mixed with a third of its weight of calined lamp-black and syrup, the mass being squeezed through a hole in a plate, after which they are allowed to dry and heated to a high temperature.

In the early days of the electric light, clock-work was used to keep the carbons at the proper distance from each other, and is still used in the Serrin lamp, one of the most efficient of all. Most of the others are regulated by an electro-magnet, which draws the carbons nearer to each other whenever the strength of the current slackens through the distance between them becoming too great.

Various contrivances have been devised from time to time to do away with the necessity for any sort of complicated regulator. In the Wallace-Farmer lamp two plates of carbon, 9 in. long by 5 in. broad, are kept apart by means of an electro-magnet, which attracts a plate, to which the upper one is attached as soon as the current passes, and keeps it at the proper distance. The light travels all over the carbon surfaces, the electric current taking the shortest road. These lamps burn for 100 hours and more, but require to be regulated every half-hour or so. In the Rapieff lamp four carbons are used, so placed as to form an inverted and upright  $\Psi$ , the light being produced at the point of intersection.

Jablochkoff's electric candle consists of two carbon rods, separated from each other by a strip of china clay or plaster of Paris. A chip of carbon is placed across the top, and as soon as the current passes this is fused and an electric arc is formed between the two points, which being

side by side, are always at the same distance from each other. The china clay melts with the intense heat, and forms a conductor between the two points. Alternating currents are used with the Jablochkoff candle. Wilde's candle is said to be an improvement on Jablochkoff's, and consists of two cylindrical rods of carbon mounted side by side in separate holders. The carbons are covered with a thin coating of lime to prevent the light from travelling down the contiguous sides of them. Wilde's candle, from its simplicity, seems likely to drive all others out of the field.

The simplest of all electric lights are the incandescent lamps of Swan, Edison, and others. They consist of a loop of carbon connecting the two wires supplying the electricity, and enclosed in a vacuum. The light is produced by the electric current heating the carbon filament to a white heat. The carbon having no air about it is not consumed, but although hardly thicker than a pin lasts for 1,000 hours before it crumbles away by the intense heat. The different incandescent lights only differ in the shape of the lamps and in the sources from which the carbon is obtained, Edison using carbonised bamboo, and Swan cardboard. The incandescent light is most undoubtedly the light for domestic purposes.

Of late, we have heard a great deal about what is popularly called the "storage of electricity," but, as we shall presently see, the term is an erroneous one. Going back to the Daniell's pair, shown in figure 3,\* let us suppose that we join up the wires and work the pair, so to speak, to death, until, in fact, no more electricity is evolved, taking care, of course, not to renew either the acid in the porous pot or the sulphate of copper in the copper vessel. We shall now have a strong solution of sulphate of zinc in the porous pot and dilute sulphuric acid in the copper can, the whole of the copper contained in the primary solution having been deposited on its sides in the form of metal. Now let us send through this worn-out pair a powerful current of electricity, either from another battery or from one of the dynamo-machines just described, but in a reversed direction. As the current circles round two things happen. First of all, the dissolved zinc gradually deposits itself on the zinc rod, and the copper deposited on the sides of the can begins to dissolve. If we keep the action up long enough, the whole of the deposited copper will be re-dissolved, a fresh solution of sulphate of copper thus being formed, while the whole of the zinc in solution in the porous cell is once more deposited in its old place. We have, in fact, renewed the life of our pair and restored it to its primitive state of vigour, once more ready to supply a current of electricity for a certain time.

We should hardly call the operation just described a "storage of electricity" yet in principle it is similar to the process adopted for making Faure's secondary batteries. It has before been said that when two metals are plunged into a liquid acting unequally upon them, a current of electricity is generated on the surface of the one which suffers most. This fact is not only true of dissimilar metals, but of the same metals and their oxides, when the latter are conductors of electricity. A description of the method used in the formation of Faure's secondary batteries will make this clearer. We must premise that there are three principal oxides of lead, the protoxide, known to most of us as litharge, which contains one dose of metal to one of oxygen; minimum or common red lead, in which the proportions are 2 to 3 or 3 to 4; and the peroxide, in which they are 1 to 2. The peroxide, it should be stated, is a conductor of electricity. If two plates of sheet lead be covered with a thick layer of red lead, plunged into dilute sulphuric acid, and a current of electricity driven through them, a peculiar change will take place. According to the direction in which the current is driven the red lead, on one plate will give up its oxygen, while that on the other plate will absorb oxygen, so that in course of time one plate will be covered with spongy metallic lead through the loss of oxygen, while the other will be covered with peroxide of lead through the absorption of oxygen by the coating of red lead. We have now a lead and peroxide of lead pair in dilute sulphuric acid. On disconnecting the battery or dynamo-machine, and joining up the wires, a current of electricity will be generated on the surface of the spongy lead, and will continue to flow until the spongy

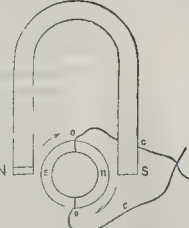


FIG. 8.

\* See p. 613, ante.

\* See p. 611, ante.



lead has once more become oxidised. The power of the pair may be once more renewed by again passing a current through it as before. The present mode of construction is seen in fig. 9, which shows the battery as seen when looking down upon it.

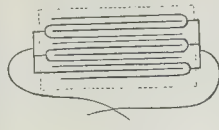


FIG. 9.

Six sheets of lead of such thickness that a square foot weighs 2 lb., are taken, five of them measuring 12 in. by 20 in. and one 12 in. by 10 in. The large sheets are folded into the form of a  $\Sigma$  as shown in the figure, a strip of lead being soldered on to the top of each curve as well as to the single sheet. The sheets are painted thickly with red lead on both sides, and against each surface is pressed a piece of felt, the face of which is also thickly coated with red lead, the proportion of red lead to metallic lead being about 3 to 2 in weight. These sheets are placed side by side in a water-tight case, which is filled with dilute sulphuric acid, the alternate sheets being connected together as shown in the figure. There is but little doubt that these secondary batteries will play a very important part in the electric lighting of the future.

#### THE ST. GOTHARD INTERNATIONAL FÊTES.

THE present week has witnessed the definitive opening of the St. Gothard Railway, and the celebration of the inauguration by a series of *fêtes* of unusual brilliancy, attended as they were by Ministers, Deputies, Ambassadors, and other distinguished personages belonging to the three nations principally concerned. Italy, Switzerland, and Germany were all influentially represented on the occasion. On Saturday last took place the departure of the invited Italian guests from Rome, and of the invited German guests from Berlin, both *en route* to Switzerland. The Italians on their way were entertained at a banquet by the Mayor of Genoa, whence they departed for Switzerland on the following day, arriving in Lucerne on Sunday night. About the same time the German guests likewise reached that city. The *fêtes* proper commenced the following morning (Monday, the 22nd inst.) by a trip over the charming Lake of Lucerne and the ascent of the Rigi Kulm, where the guests, who were 500 in number, were entertained by the St. Gothard Directors at a splendid luncheon. The ascent of the Rigi was made in seven separate trains. The guests were conveyed in the afternoon back to Lucerne by the two steamers, the *Italia* and *Germania*, which had brought them out in the morning.

At five o'clock in the evening the President of the Swiss Republic, M. Bavier, who, as we informed the readers of the *Builder* some time ago, is himself by profession a civil engineer, proceeded to the Hôtel National, and there, along with his colleagues of the Federal Council, received the invited guests from Germany and Italy. The Italians were introduced by Signor Tecchio, the President of the Italian Senate, while the Germans were introduced by Herr von Kendorff, the German Ambassador at Rome. Among the Germans present were the German Foreign Secretary, Count von Hatzfeldt, Ministers Heitner and Bötticher, Dr. Stephan, the Imperial Postmaster of Germany, ex-Minister Delbrück, and several other Ministers from the smaller German States, in addition to about two hundred members of the German Parliament. The Italian guests included, beside several hundred members of the Italian Senate and Chamber of Deputies, several Ministers and ex-Ministers, among them being Signors Baccarini and Mancini, Generals Menabrea and Minghetti. At half-past six o'clock the whole of the guests in Lucerne were entertained at a splendid banquet by the Swiss President, in the magnificent hotel, the Schweizerhof. Here the health of the German Emperor and the King of Italy was drunk amid the greatest enthusiasm, and speeches were delivered by leading persons belonging to each of the three nationalities. In the evening there were fireworks and an electric illumination of the lake, quay, and snow-capped mountain peaks around Lucerne, the effect being described as extremely brilliant.

The programme of the rest of the festivities included the grand trip of all the guests over

the new line, which took place on Tuesday, the 23rd. Before entering the great tunnel, the travellers were entertained at a luncheon at the Göschenen Station, at the north or Swiss end of the tunnel. They reached that place in three trains, which all left Lucerne at close intervals between seven and eight in the morning. After the luncheon the guests entered their carriages again, and proceeded through the great tunnel, which is nine miles and a quarter long, and, therefore, the longest in the world. The trip from Lucerne to Lugano is through some of the grandest mountain scenery in the world, and there is little doubt that the anticipations so freely expressed at these *fêtes* that the St. Gothard line would become the favourite route between Italy and Northern and North-Western Europe will be realised. It is expected that Englishmen in travelling to or from London and the East Indies *via* Brindisi will in future make use of the St. Gothard route, as it is the shortest as well as by far the grandest in Europe. The engineering difficulties have been frequently described, and it is not necessary here to say more on that subject than that they are such as to raise the St. Gothard line to one of the modern wonders of the world. The *fêtes* in celebration of the final opening of this railway concluded by a grand banquet in Milan on Wednesday, and the return to Lucerne, and a farewell festival in that city on Thursday.

#### THE LORD MAYOR.

THE last act of the Lord Mayor as the Right Honourable John Whitaker Ellis, was to entertain at dinner in the Egyptian Hall at the Mansion House, a large number of architects, engineers, and surveyors, with whom the Lord Mayor was acquainted, or had been connected professionally. There were also many ladies present. On the following morning the Lord Mayor received a letter from the Prime Minister informing him that her Majesty had been pleased to signify her intention of conferring upon him the honour of a baronetcy in connexion with the Queen's recent visit to Epping Forest. Returning to the dinner, the proceedings were understood to be, to a certain extent, private; but several speeches were made. Major Edis, architect, spoke for "The Reserve Forces." To the toast of "My Guests," Sir Joseph Bazalgette spoke for the engineers present; Mr. Horace Jones, F.R.I.B.A., for the architects; Mr. Edward Ryde, for the surveyors; Mr. Haskinson, of Nottingham, for the land agents; and Mr. R. C. Driver, for the Auctioneers. Sir J. A. Pictou, Liverpool, proposed the Lord Mayor's health, and Mr. Hardwick gave, and Sir John Humphreys, coroner, replied for, "The Ladies." Amongst the visitors present, besides those already named, were Mr. Whichcote, Mr. Arthur Cates, Mr. E. Woodthorpe, Mr. F. Porter, Mr. Penrose, Mr. John Clifton, Mr. G. Godwin, Mr. Hawksley, Mr. Sturge, Mr. Gore, Mr. R. C. Driver, Mr. H. Currey, Professor Hayter Lewis, Mr. Fenwick, Mr. Cundy, Mr. Vigors, Mr. D. Watney, Mr. E. Tawson, Mr. Ritchie, Mr. G. B. Williams, Mr. Farmer, Mr. E. Norton Clifton, Mr. Sqaerey, Mr. E. Fox, Mr. Deputy Hammaock, Mr. Chadwick, Mr. Coverdale, Mr. F. W. Goddard, Mr. Chatfield Clarke, Mr. Penfold, Mr. Chinnock, Mr. Garrard, Mr. Galsworthy, Mr. C. W. Driver, Mr. H. Ellis, Mr. T. H. Staples, Mr. Peebles, and Mr. Innes. The Lord Mayor's Deputy in his ward is appropriately an architect, Mr. James Edmeston, who was also present. Mdme. Matilda Ziméri sang very charmingly several songs.

The Right Hon. John Whitaker Ellis, of Byfleet, near Weybridge, Surrey, and of Westbourne-terrace, Lord Mayor of London, upon whom her Majesty has been pleased to confer a baronetcy in commemoration of her recent visit to Epping Forest, is the son of the late Mr. Joseph Ellis, of Richmond, Surrey (a staunch friend of the late John Britton, F.S.A.), where he was born in the year 1829. He was educated at Richmond under the care of the Rev. William Allen. At the age of fifteen he was articled to Messrs. Masgrove & Gadsden, land agents and surveyors, of Old Broad-street. In 1854 he became a partner in the firm which is now known under the style of Farebrother, Ellis, Clark, & Co., Mr. Alderman Ellis being, however, now the sole representative. In 1858 Mr. Ellis married Mary Ann, youngest daughter of Mr. John Staples, of Belmont, near Salisbury. He entered the Court of Common Council in 1854, having previously served in

various offices connected with his parish. On the resignation of Alderman Sir John Masgrove, Mr. Ellis, at the invitation of a large number of the inhabitants of the ward, came forward as a candidate for the vacant gown, and was unanimously elected. He is one of her Majesty's Lieutenants for the City of London, and in November last was chosen to fill the office of chief magistrate of the City. He is a member of the Court of the Merchant Taylors' Company, and has been for many years engaged in agricultural pursuits in the parish of Byfleet.

#### CONGREGATIONAL CHURCH, Highbury QUADRANT.

THE group of buildings shown in the illustration consists of a church seating 1,200, lecture-hall in the rear for 650 adults, and the necessary vestries and rooms for committees, ladies' meetings, infants, &c., and a service.

The facade of the church is in the large and practically unobstructed area, the supports of the centre lantern being so placed that they only obstruct the view of the pulpit from the passages between the seats.

To keep these piers, of hard York, as light as possible, a wooden superstructure was adopted, covered on the outside with Lascelles's red concrete slabs, oast to a special design; and the whole of the timber framing is so trussed and tied that all strains are resolved into dead weight on the piers.

The school is planned, as an irregular octagon, for a large number of classes (twenty-six), and also to be readily used as a lecture-hall; and it has been found in practice to answer its double purpose remarkably well.

All the timber work is of pitch-pine, wrought in the interior, and without varnish, on the outside left with saw-cut face, and coated with Stockholm tar. The walls inside are faced with hard cream-coloured "gaults," and outside with deep red Suffolk bricks, relieved by moulded work to the openings and dressings of the hard Bath stone.

The roofs are covered with slates, and the windows filled with tinted cathedral glass, in geometrical patterns. The warming is by a high-pressure hot-water apparatus.

The whole of the buildings, owing to their extent, are necessarily simple in detail, and have been well carried out at an expense of from 11,000l. to 12,000l., by Mr. J. Chessum, of Great Eastern-street, under the supervision of the architect, Mr. John Salaman, of Farnival's-Inn, Holborn.

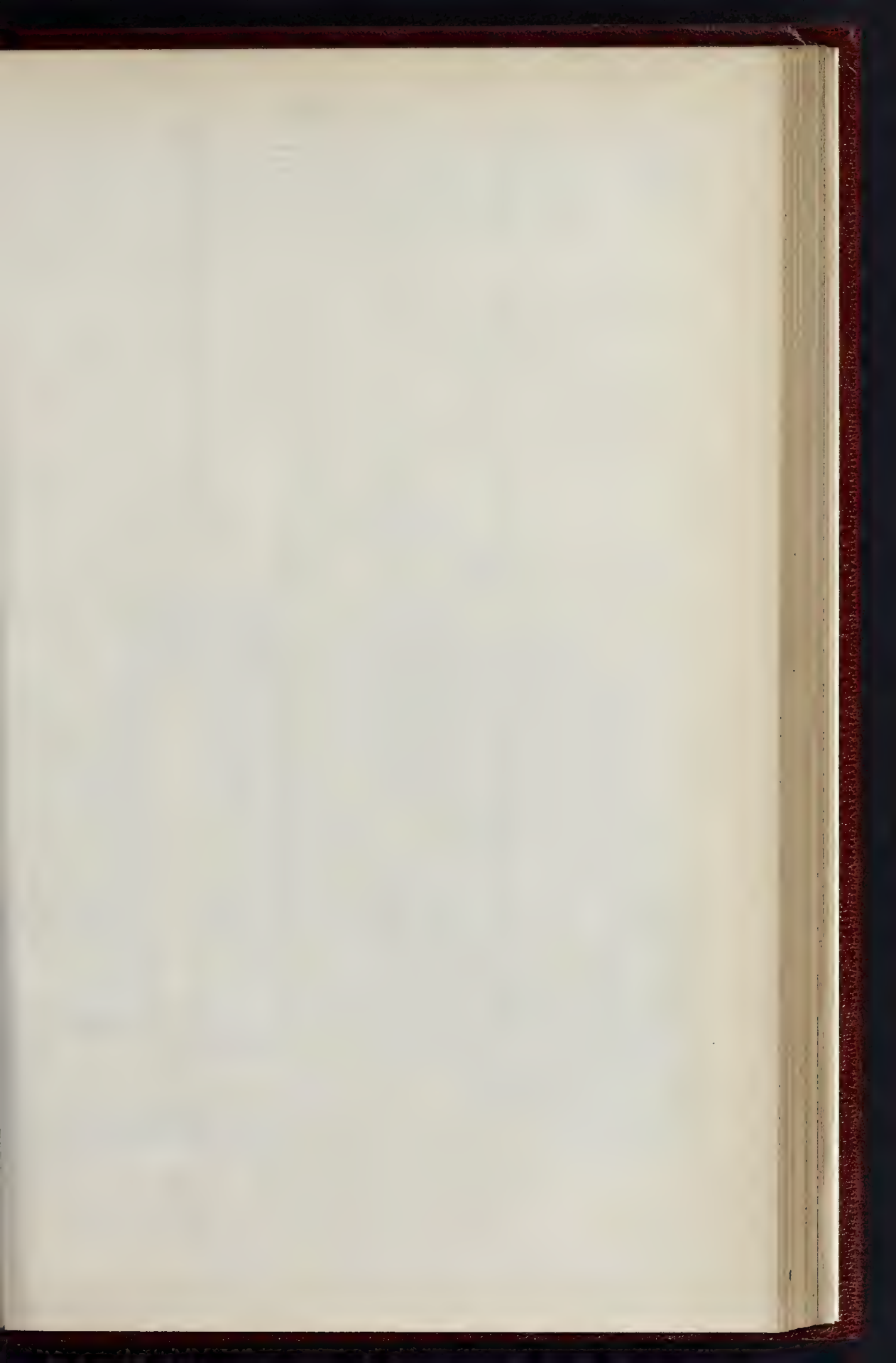
#### MEVAGISSEY CONGREGATIONAL CHAPEL, CORNWALL.

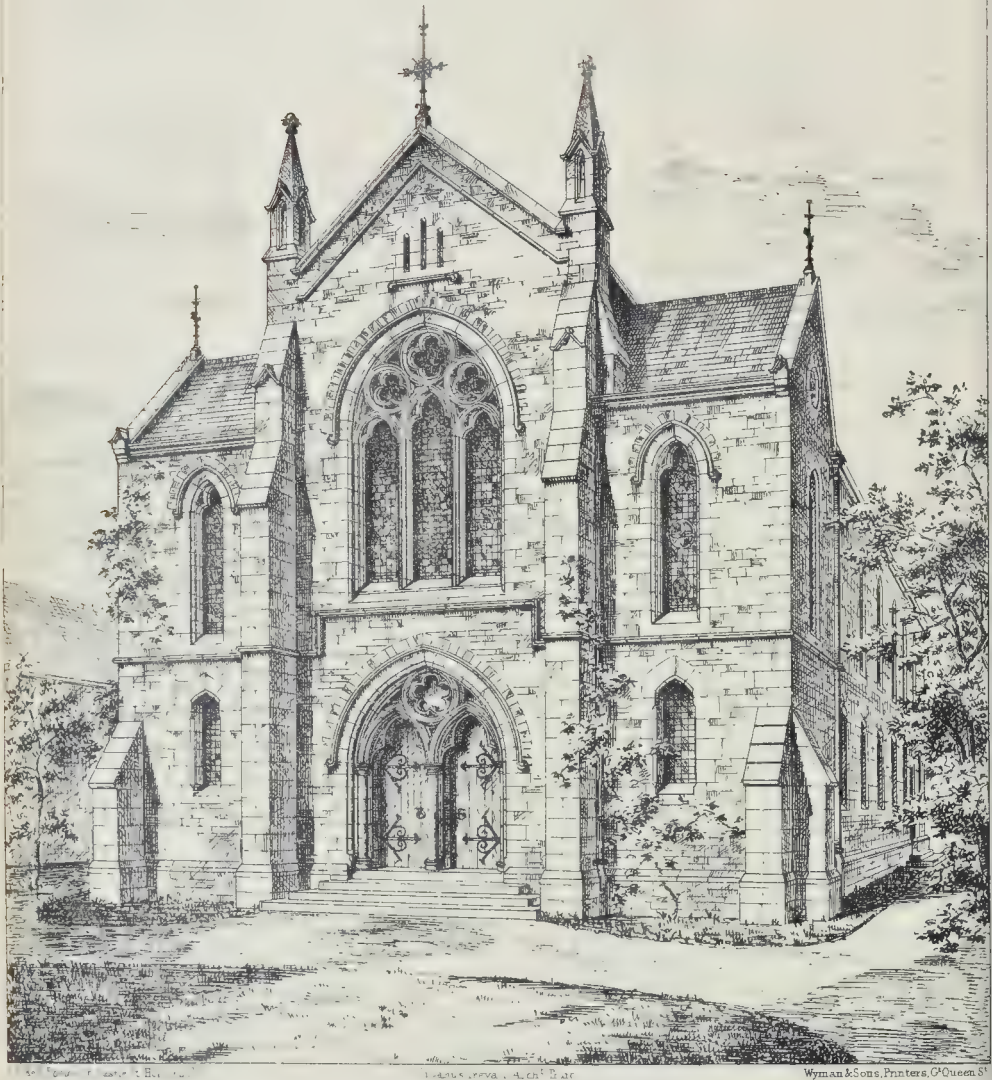
THIS building is being erected in the romantic little fishing town of Mevagisey, on the south coast of Cornwall, and replaces a chapel of much earlier date belonging to the same denomination. Accommodation is provided for 400 persons. A gallery runs completely round the building; the roof is partly open and of pitch-pine, and the pews and all other joinery are of the same wood. The external dimensions are 66 ft. by 40 ft., and the amount of the contract is 1,257l. The architect is Mr. Silvanus Trevail, of Truro; and the builder, Mr. Benjamin H. Roberts, of Mevagisey.

#### THE STADT-THEATER, LEIPZIG.

IN our present number we give a view of the portion of the Stadt-Theater, which abuts on the Schwanenteich (Swans' Lake). The imposing edifice here rises upon a massive substructure. A semicircular bastion, flanked by stairs broken in the angle, serves as the base for the rear façade of the centre portion of the building, to each side of which is attached a covered balcony with brick columns. The windows of the first story are flanked by colossal caryatides, over 25 ft. high. Above the centre portion rises the "galerie," of plain elevation, but necessary for drawing up the scenery. The height of the stage from the lowest level to the roof is 140 ft. The stage itself is 100 ft. wide and 80 ft. deep; the proscenium opening 51 ft. wide and 48 ft. high. In the auditorium,—of the usual horseshoe form, and which contains, besides pit and stalls, four tiers rising above each other as in an amphitheatre,—there is room for 1,900 persons, of whom 1,450 are provided with seats.

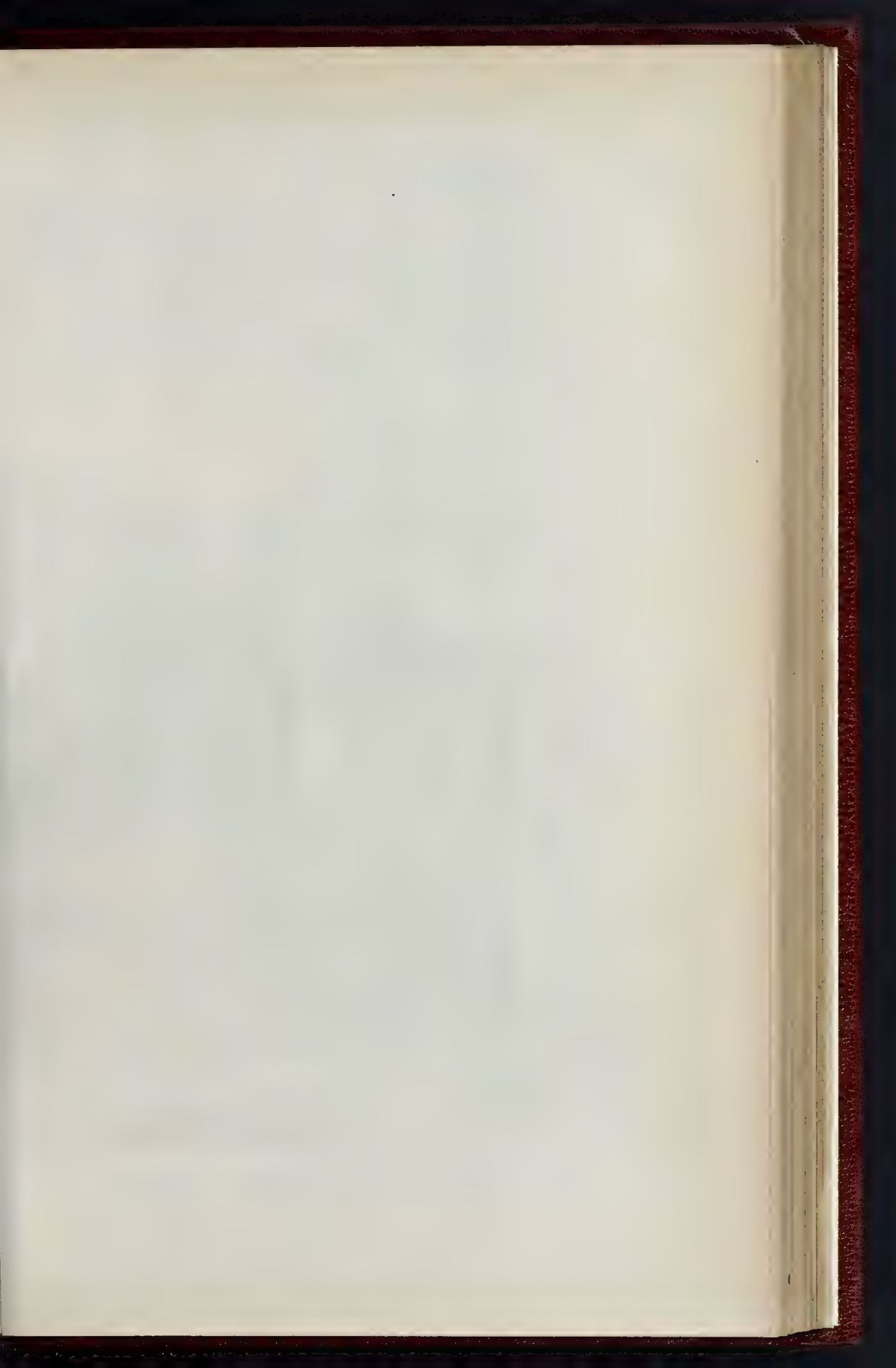






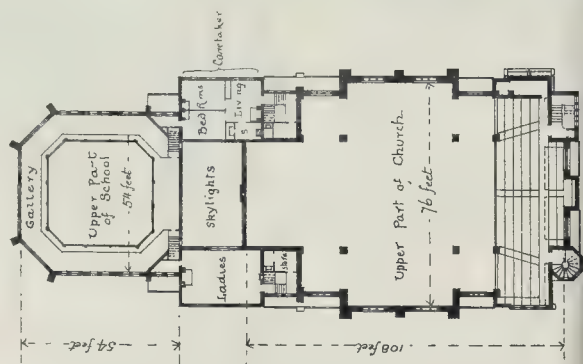
CONGREGATIONAL CHURCH,  
MEVACISSEY, CORNWALL.



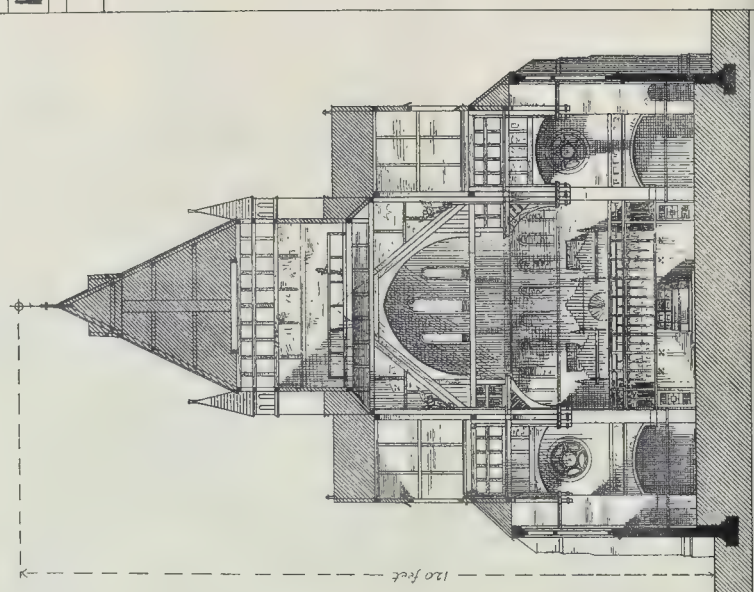
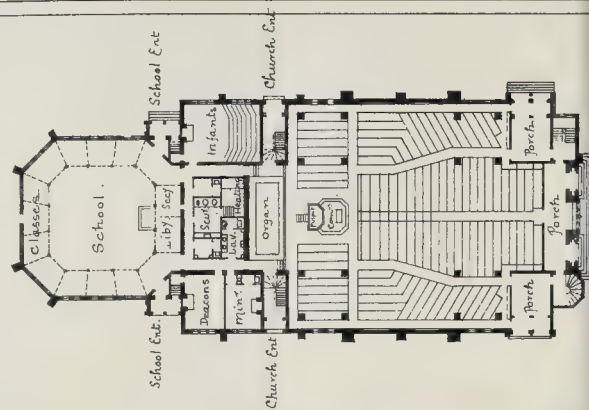


THE BUILDER, MAY 27, 1882.

# CONGREGATIONAL CHURCH & SCHOOLS



# HIGHBURY QUAD? LONDON: N.







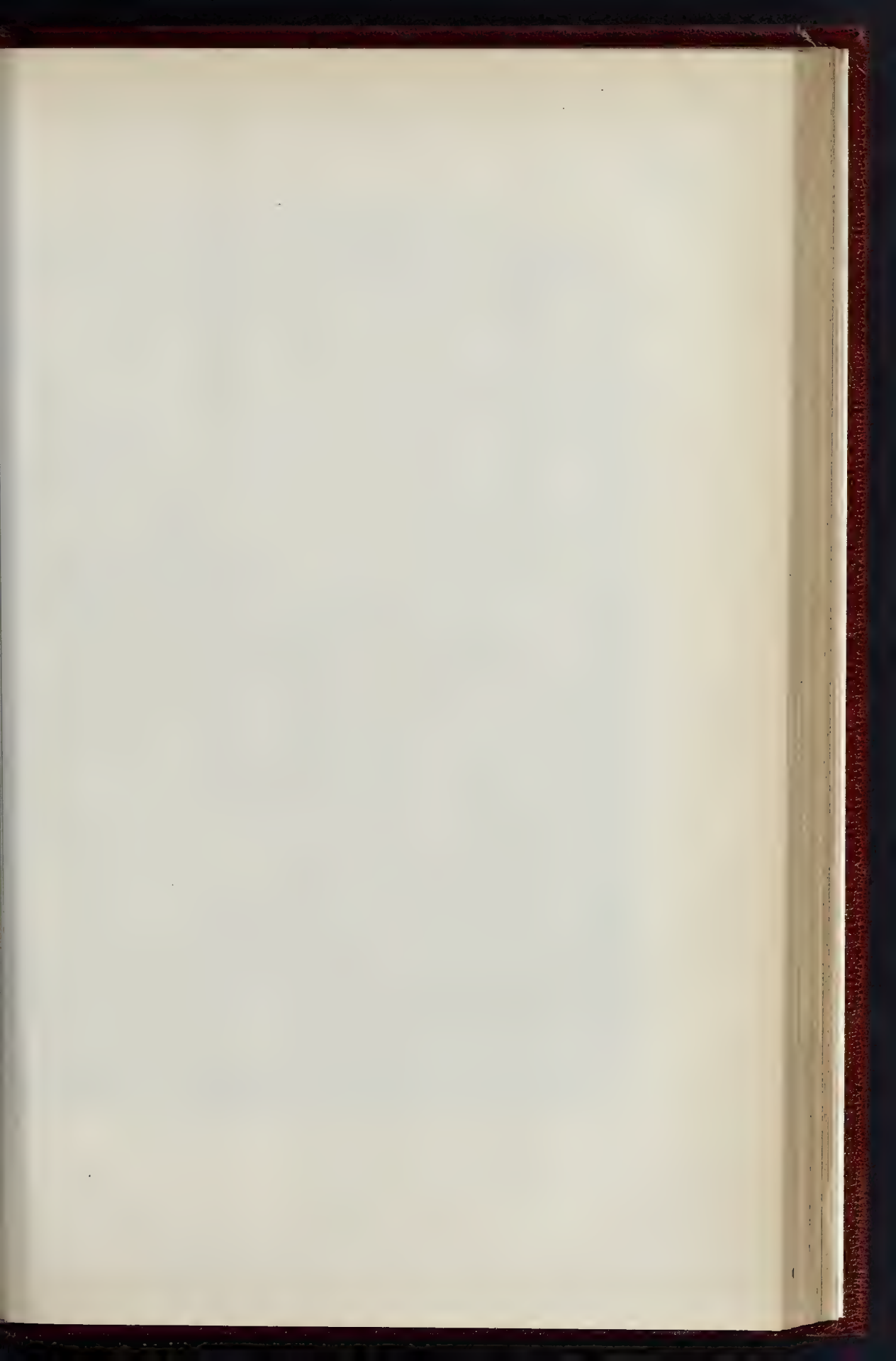
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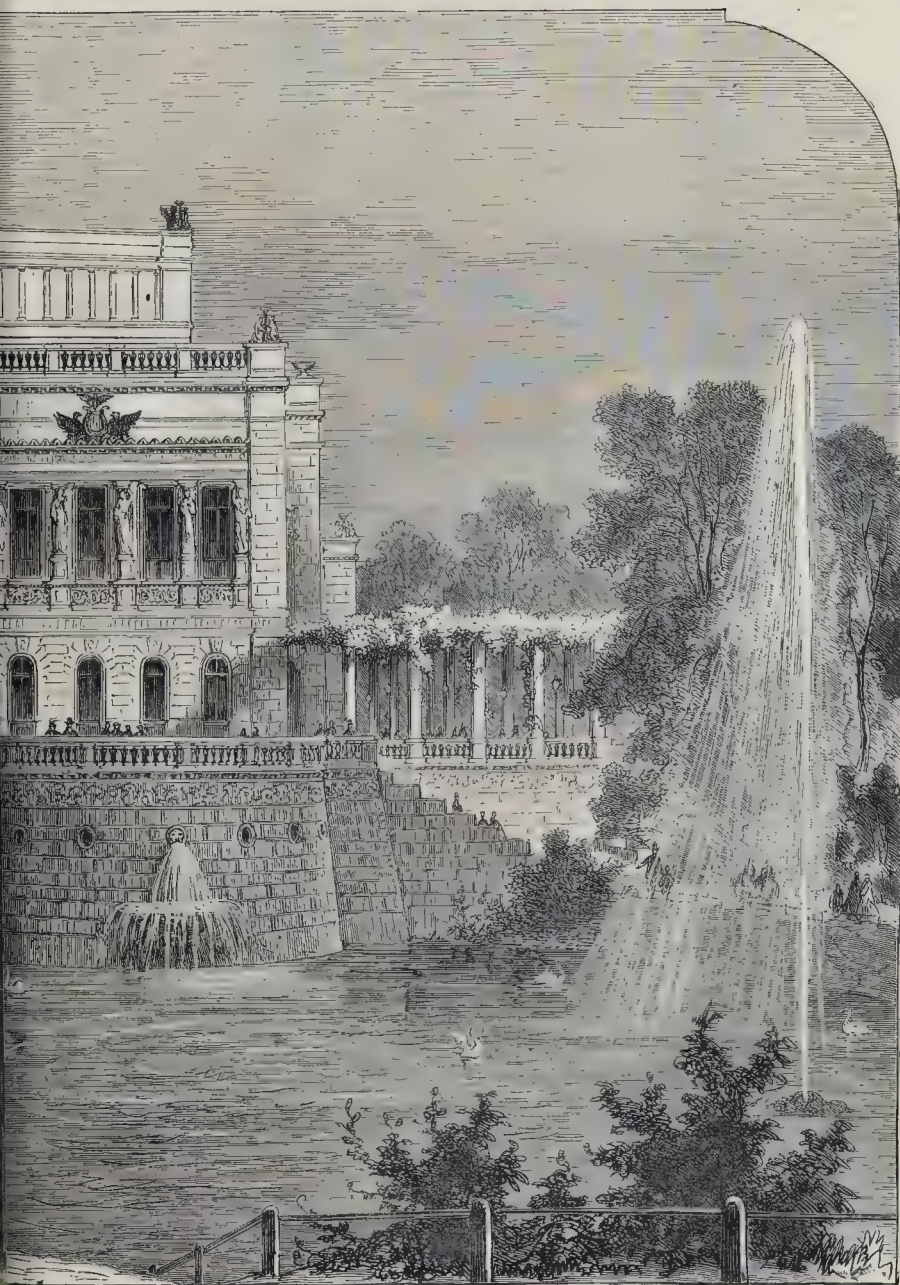










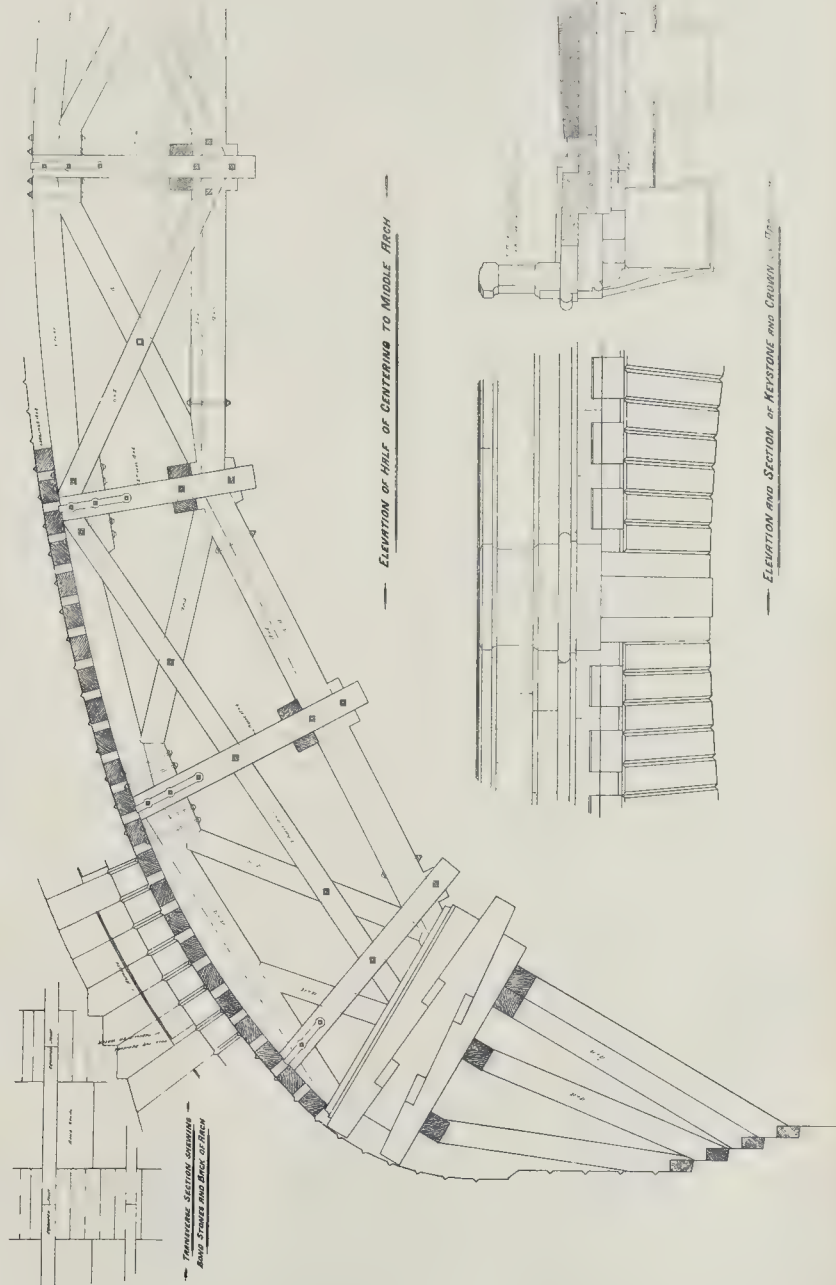






DRAWING NO 3

DESIGN FOR A STONE BRIDGE.



Whitcomb & Bas. Pat. Law 236 H. H. Holton





## PRIZE DESIGN FOR A STONE BRIDGE.

We add, as promised, to the illustrations of Mr. H. Phelps Draw's design for a stone bridge, to which the Grissell Gold Medal has been awarded, an additional page, showing, amongst other things, the centering for the middle arch.

## A CHAT ABOUT HOUSE BUILDING.\*

## Roofs.

It seems a pity that our roofs cannot be finished when the house is built once and for all, and that as soon as the workmen have cleared away the roof begins to go wrong, and to the end of our lives worries us continually. We get a heavy rain. "Please, sir," says the servant, with the breakfast tray, as immortalised in *Punch*, "there is such a damp spot on my bedroom ceiling." The sparrows build their nests in our down-pipes,—how they manage to escape drowning I could never make out, but the overflow and the damp will show us what they have been at. After a windy night we find a slate or two sticking in our flower-beds, we all know what that means. We are awakened by the wind in the middle of the night. "I do hope," we say, "that chimney-stack is quite safe, the wind is this way, and if it should come over it will fall right across our bed."

Let us see if we cannot scheme something that would, at all events, mitigate these troubles and make our roofs a little more like what a good roof should be.

Flat roofs are very convenient. Iron girders and joists, as already described, faced with slabs and concrete, and finished with asphalt, with a fall for water, make a very good roof, and if the rain-water is not wanted to be saved in a tank for domestic purposes, a rock garden can be planted on it, and many plants of the Alpine species will grow well, and give no trouble; or a glass roof can be put over the flat, and a roof greenhouse be thus constructed. It might be said the glass would blow away in no exposed place; but I have tried it, and I do not think for ten years I have had a broken pane of glass; this forms a capital ventilator, for the house staircase leads to the flat roof, and by leaving the door open, a continual current of air is drawn up through the house by the heat of the glass, and escapes through the laps or the ventilators.

One advantage of this system is, it gives a room where an hour or two after the other rooms have become too dark for reading or drawing, the work or amusement may be carried on. I know where rooms constructed in this manner have been put up for artists, not on the top of the house, but on lower premises at the side of the building. The principle, however, is the same.

The oldest roof, perhaps, in existence is made of concrete, of a dome shape, and in one piece, like an inverted basin, and appears now to be as sound and perfect as it ever was. It has been covered with copper, but the copper has gone long since, and the concrete alone remains, defying the weather, as it has done for twenty centuries.

Many ancient roofs were covered with heavy tiles, about 2 ft. each way, and 1½ in. thick, and turned up at each end with a half-round tile to cover the junction. The great advantage of this system was that they would sustain the weight of a man, and no wind was likely to disturb them.

Our old cathedrals are covered mostly with lead, cast in sheets, thick and soft, wonderfully durable and pliable, and costing very little to keep them in order.

Some old houses in out-of-the-way places in England are still roofed with thin stone flags, the larger ones next the eaves, the smaller near the top.

All these systems have the advantage over tiles or slates, that the wind or the passage of workmen is not likely to displace them, although the weight is greater, and strong roof timbers would be wanted to support them.

In country districts where good views are likely to be obtained, I must say I lean towards the flat-roof system, especially with the glazed structure over to keep the roof from blacks, but where this is not wanted, then I prefer the heavy tile, that when put in its place cannot be disturbed by wind or rain, and that you can rely on without fear of any damage.

Long ladders for getting on the roof should be dispensed with; every roof should have a door, and means should be contrived by which workmen should be able to get at all parts for examination or repairs.

It would be quite easy to make roof tiles in concrete, and to cast in them stepping-pieces, whereby any workman could reach any part of the roof without ladders; all these are matters of detail, which might be adopted or not, but I would lay down the principle that all roofs should be fireproof, the rafters being of iron, that no tiles or slates that would not bear the weight of a man, or that can be blown away by the wind, should be used, and that all parts of the roof should be accessible without the aid of long outside ladders, and if these matters were embodied in the construction of our roofs, I see no reason why they should require repairs from one end of the year to the other.

## Chimneys.

The value of an upcast-shaft in every room is so great that I would have double the usual number of flues in every chimney-stack. For the division in flues, freclay is an excellent thing; the object is that the heat of the smoke-flue shall warm the air in the adjoining flue, which should be an extractor to draw off the barst and vitiated air from the room in which the fire is burning. The inlet should be near the ceiling, and I have found a slight turn in the bottom of the flue prevents the down-draught when the fire is not in use. It is also very handy to have an extra smoke-flue or so, and if it should be found advisable to divide a large room, or to put up a conservatory or other addition, the value of such extra flues will be found.

When the chimneys are being built it adds very little to the cost to put plenty of flues: they are no harm if not wanted, but if they have to be added afterwards the cost is a great consideration.

In exposed places chimneys should be kept in the inside of the house, especially the kitchen chimney and the rooms where fires are mostly kept; they will be found to draw much better than when exposed, and even in cold weather to warm the house and to keep up a circulation of air that is most desirable.

Chimneys are not usually made high enough above the roof, the higher a chimney the better it will draw, and the negligently made-shafts, such as chimney-pots, would not then be required. The objection to a tall chimney is its liability to be blown over, but there are two ways of obviating this. The first is to make it much larger than is usual; extra flues, as I have already explained, may become very useful, and if not used are in no way objectionable.

Brickwork should always have a tie of iron when used for chimneys, at its junction with the roof; if a slight iron rod or gas pipe, or even a piece of stout hoop iron, was carried up at each corner of a chimney and built out in the brickwork, it would give the vertical tie that is required, and a chimney thus built could not blow down unless the iron on one side broke, and such a contingency is highly improbable, and by increasing the strength of the iron may be made impossible.

The mortar joint usually put is no tie at all, the weight of the brickwork is not sufficient to withstand sudden gusts, and all chimneys, especially if carried higher, as I would recommend, should have a vertical iron tie.

## Heating and Ventilation.

Fire-clay is sweeter and more wholesome than iron, and open grates are better than stoves.

Shallow fires are more economical than deep ones, and fire-clay bottoms are better than iron gratings. It is a pity that there is always such a burnt-air smell with an iron stove, but there is no getting over it, wherever fire-clay can be used it will be found the best. Open grates should always be used for rooms, because they require a large supply of fresh air, owing to the rapid current up the chimney. This supply is drawn in through the chinks of the windows and doors, and so the air in our room is constantly changed. It seems curious, but although we should not build a stable without a manger, or chain up a dog without seeing that food and drink was within his reach, we construct a chimney to carry away the air and make no provision whatever for its supply; in fact, by tight-fitting doors and windows we do our best to prevent the fire getting any. The gas and the occupants all require a large supply of

fresh air without any provision whatever being made for its admission.

Grates in the basement should have a hit-and-miss ventilator fixed on outside in connexion with the air-space under the floor; a similar ventilator should be put in the outer wall, so that a continual current might by this means be kept up.

There is no reason why appliances should not be provided in a newly-built house, by which means fresh air, either hot or cold, should be turned on to any room in the house. If people took half the care of themselves they take of their plants, it would add greatly to their enjoyment.

The simple law that regulates all heating and ventilation is,—hot air rises, cold air falls. By bearing this in mind, mistakes would seldom be made.

Every well-built house should have in its basement a warming apparatus. Any hot-house boiler or hot-air stove will do; some are better than others, but any will answer the purpose.

To supply this stove, one of the extra flues I have recommended for my chimney should be connected with it, and to prevent the smoke being drawn down the chimney-top should be closed, and a hole the size of the flue out in the chimney-shaft near the top, by preference on the north side, with a grating over it to keep out the birds. This air is sweeter and purer than air near the ground. If the stove is a hot-air stove, the air simply passes through it, and is ready for delivery; if a greenhouse stove, a coil of pipes filled with water will be required.

Bearing in mind that cold air falls, the air in the shaft will readily be drawn into the hot-air chamber, and when warmed this same air will rise, and flow into any room of the house in which it may be wanted.

By utilising another of our spare flues, the air can be carried to the top of the house, and by having doors in the chimney-breasts to fall into the rooms, it can be admitted simply and inexpensively. This air should not take the place of grates in the rooms, but be merely an auxiliary supply; and in very cold weather, when air for the supply of the fire and ourselves must be admitted into our rooms, it is better that it should be warmed than cold, and will be found to make the entire room more comfortable, and free from draughts. It would be well to have an outlet from the warm air-chamber into the stairway, as, by raising the air in the stairs and passages to an equal temperature with the rooms, no draught will be felt on opening doors.

You may, perhaps, think I am somewhat bigoted about draughts, but a long-continued draught will kill any living thing; even plants placed in a draught will dwindle and die, and a dry house filled with pure air, and free from draughts, is as yet a desideratum.

Having now shown how a house in the winter time can be warmed, and having provided warm fresh air for ourselves, our fires, and our lights, with an extracting-flue to carry away the used-up air in the upper part of our rooms, we will now see how we can cool our rooms in the summer time, so as to increase our enjoyment all the year round.

It is usual to have in one of the rooms in the roof a water-tank for the supply of the house, into which water is forced when there is no water inside, or pumped where none exists.

I would have two of those tanks, one within the other, the inner one say 2 ft. each way smaller than the outer one. Suppose, for instance, the outer tank is 8 ft. long, 8 ft. wide, and 4 ft. deep; the inner tank should be 6 ft. long, 6 ft. wide, and 3 ft. deep; the outer tank would contain the water and the inner tank would be empty. Now, you will see by this simple means I get a volume of air much cooler than the ordinary temperature, and if cooler, therefore heavier, and if I cut a hole through the bottom of the two tanks and carry a pipe through the side of the flue, the cold air would so surely fall wherever it is carried, as the water in the tank will fall wherever it is led. This room should be connected with the spare flue and a grating near the top of the chimney-shaft, which we have provided to supply the fire with air in cold weather, and by reversing the action of our hot-air shafts, bearing in mind that hot air rises and that cold air falls, we can admit a stream of cooled air wherever we like.

In very hot weather the temperature of the water will be raised, and when most wanted it will act most sluggishly. To remedy this, blocks

\* By W. H. Lassolles, Builder. See p. 621, ante.



in an excellent manner by the contractors, Messrs. John Aird & Sons, and their total cost, including the enlargement of an existing reservoir and some other works not mentioned, will be about 60,000*l*. (This is altogether exclusive of the outlay at the Hammersmith pumping station.) The works have been designed by and executed under the supervision of the engineer to the company, Mr. Thomas Hack, M.Inst.C.E., who expresses great satisfaction with the Staffordshire blue bricks supplied by Mr. Hamblet, and with the square pipes supplied by the Aylesford Pottery Company. From the foregoing necessarily brief description it will be seen that the works now completed possess some points of special interest.

#### STONE-WORKING BY MACHINERY.

The working of stone of all kinds for building purposes by suitable machinery is a matter which largely engrosses the attention of master-builders and contractors, and as one of the most useful and economical machines, the rubbing-bed or surfacing-machine, has of late years come into peculiar notoriety. The saving in time and labour by the use of these machines is a fact beyond dispute, and the increasing favour in which they are held is demonstrated by the call for larger machines. When first introduced, machines of this description, with revolving tables of 7 ft. 6 in. or 9 ft. diameter were, for the most part, employed. Then, when their utility had been fully established, and large contracts, such as the new Law Courts, required an immense quantity of stone to be manipulated, machines with tables of 11 ft. diameter were required. This was again increased to 13 ft., of which size many machines have been made during the last two years.

More lately a 13-ft. machine with the large rubbing surface which it presents is found insufficient, and Messrs. J. Rotheroe & Co., of King William-street, have just completed a machine with a table 14 ft. diameter for one of the largest stone-merchants in London. This is, we believe, the first machine of so large a diameter that has been manufactured, and it is satisfactory to know that the trial has been quite successful. Means are employed to secure the greatest steadiness and truth when revolving; and the quantity of rough stone that can by this means be surfaced to a perfectly even finish places the stone-rubbing bed in the forefront of masons' machinery.

#### BOYLE'S SYSTEM OF VENTILATING SHIPS.

As we announced a week or two ago, Messrs. Robert Boyle & Son, of the Holborn Viaduct and Glasgow, were awarded the prize of 50*l*. offered by Mr. ex-Sheriff Burt for the best system of ship ventilation exhibited in connexion with the Shipwrights' Company's very interesting and valuable Exhibition of Ship Models recently open at the Fishmongers' Hall. We append a few notes explanatory of the system, which has the great merit of being automatic. To properly ventilate any apartment, whether it be a theatre or the saloon of an ocean-going steamer, provision must be made for the inlet of fresh air as well as for the exit of foul air. Ventilation in its true sense cannot be effected by the omission of either of these desiderata, although it is often attempted. Messrs. Boyle, as ventilating engineers of experience, have, it is needless to say, steered clear of any such mistake or omission, and their system of ship ventilation provides both for the inlet of fresh air and for the exit of vitiated air. The fresh air is admitted by their patent down-cast ventilators, standing well up from the surface of the top deck, and, by preference, to the fore of the extraction shafts, so that the passage of the vessel across the sea may as far as possible be made to aid in the work of ventilation. The mouths of the down-cast ventilators are constructed so as to readily deflect and direct downwards with some velocity the air impinging upon their interior, and the air thus deflected is carried downwards and forwards through main trunks or pipes, disposed as occasion may necessitate, and tapped at intervals by vertical tubes with open ends some 4 ft. above the level of the floor of the saloon, engine-room, or other part of the ship. The mouth of Messrs. Boyle's down-cast ventilator, as applied to ships, is ingeniously constructed so as to allow of the immediate escape (through

a series of louvres) on to the deck of any rain or sea water that may find its way down the mouth of the ventilator. These inlet ventilators, it may be stated, are fixtures, have no movable parts, are perfectly water-tight, and can be kept in action in any weather. So much for the means taken to supply fresh air to the various parts of the interior of a ship. It only remains to be said that the extraction of the vitiated air is effected by means of Messrs. Boyle's self-acting air-pump ventilators, fixed above the deck, and directly communicating by shafts with openings made in the ceiling of the saloon or other parts of the ship. These air-pump extraction ventilators possess the great merits of being fixtures, having no movable parts; of being capable of producing and maintaining a powerful up current, whatever may be the direction of the wind; and of being free from down-draught, owing to the arrangement of the louvres. With these extracting ventilators fixed about the inlet ventilators, the circulation of air into and out of the ship is naturally facilitated by the passage of the vessel. The system is applicable to both sailing vessels and steam vessels, but is particularly adapted to steam vessels, as the rapid motion of the latter is calculated, even in calm weather, to cause a plentiful and continuous supply of air to impinge against the mouths of the inlet-ventilators, and to be carried down into the ship, while, at the same time, the effectiveness of the air-pump or extracting ventilators will be increased.

Messrs. Boyle's system of ventilating ships is but an adaptation, with one or two necessary modifications, of their system of house ventilation. It is, we should say, likely to come into extensive use, and has already, we understand, received the favourable notice of many distinguished experts and authorities in shipping and naval matters, including H.R.H. the Duke of Edinburgh.

#### ENGINEERING IN SUFFOLK.

The following letter, with stamped envelope for reply, has been sent to us in perfect good faith. We omit the writer's name; it is the system, not the persons, we object to—

Sir,—I am a farmer deputed by the parish to superintend the building of a bridge (in lieu of old one) across a river the bottom of which is a bog.

Can I do better than devise an arch of semi-circular form? I would not mind sending 2s. 6d. for the best kind of drawing for such purpose. It requires to be 11 ft. span, rising not more than 4 ft. 6 in. Some years ago (twenty) I was very successful in constructing a break-water of 10 ft. fall on a pure sand, which has stood the floods since. Perhaps you can direct me to some book of drawings.

I am not a regular subscriber to your paper.  
Badingham.

#### THE GRECIAN THEATRE FOR SALE.

On Monday last the lease of the well-known East End theatre the "Grecian" was offered for sale at Messrs' Hall Tavern by Messrs. Tabernacle & Co. The sale included the Eagle Tavern, together with the Assembly Rooms, ball-room, and pleasure-grounds attached, the whole of the property occupying an area of about one acre. The theatre was rebuilt only a few years ago, a view of the interior of the building appearing in the *Builder* at the time. It was stated that the auditorium is capable of accommodating 5,000 persons, exclusive of eighteen private boxes. All the scenery and fixtures of the theatre and the grounds, except the refreshment-bars, were included in the sale. The whole of the premises were said to be held for terms expiring in September, 1898, at rentals amounting to 365*l*, but it was explained that the underlettings amounted to 441*l*, showing an annual profit rental. These underlettings were stated to consist of the stables, billiard-room, gallery in the theatre, weighing-machine, and shooting-gallery, and the cash taken in the cloak-room, this last item being set down at 141*l*. The particulars stated that the vendor, if desired, would take from the purchaser an under-lease of the theatre and ball-room in the rear, at a rental of 1,000*l*. a year for the remainder of the term, the purchaser to have the exclusive right of supplying all refreshments, and the vendor undertaking to keep the theatre and ball-room open during the term of the under-lease. The auctioneer, in introducing the pro-

perty, adverted to the great success which had uniformly attended the management of the theatre, for many years past, under the proprietorship of the Messrs. Conquest and others, observing that Mr. Clark, the present proprietor, and now the vendor, had been equally successful. The biddings commenced at 12,000*l*, and by advances of 1,000*l*. and 500*l*. each the property was brought up to 18,000*l*, when the biddings stopped, on which the auctioneer said the property could not be sold for that sum. It was then withdrawn, the auctioneer naming 21,000*l*. as the reserve.

#### REGENT'S CANAL AND DOCKS RAILWAY.

On Tuesday, after an investigation which occupied seventeen days, the Select Committee of the House of Commons declared the preamble of this Bill proved. In sanctioning the undertaking the Chairman announced that the Committee had decided that in constructing the railway no part of the waterway of the canal should be interrupted for more than ten days at a time, and that no such interruption should occur more than twice in one year. The Committee further stipulated that the waterway was to be kept open for the full twenty-four hours daily, with the exception of Sundays. The Committee also made it a condition that the tolls on the canal should not exceed those actually taken during the last twelve months, and they were, from time to time, to be subject to the revision of the Board of Trade, and the Railway Commission.

It was stated in the committee-room that the cost of the seventeen days' inquiry will amount to about 10,000*l*., of which the fees paid to the formidable array of counsel engaged, and the several eminent engineers who appeared to give evidence for and against the Bill, will form a considerable proportion. The cost of the undertaking is estimated at 8,000,000*l*., or about half a million per mile.

#### A RESPECTED CLERK OF THE WORKS.

We mentioned briefly last week the premature death of Mr. Jas. Bubb, the clerk of the works at Truro Cathedral: he had but reached his 36th birthday. The burial took place on Saturday in last week. His aged father from London, and three sisters, followed him to his last resting-place; and, headed by the Lord Bishop, so did almost the whole of Truro's inhabitants, all mourners in the true sense of the word. The cathedral choir assembled in their robes, and sang two hymns over the coffin as it lay, not many yards from the corner stone laid two years ago. Then, the Bishop spoke some suitable words to the 110 cathedral workmen, who, all arrayed in white aprons trimmed with black ribbon, stood around. In the cemetery the service was read by Canons Mason and Harvey and Chancery Whitaker, the Lord Bishop pronouncing the benediction. Canons Phillpotts and Vautier, as well as ten other clergymen, were also present in their robes; and amongst the mourners were Mr. Pearson, B.A., Mr. Shillitoe, the contractor, and Mr. T. Shillitoe, Mr. Harry Hems, and others. The coffin is of oak, and was hidden by the wreaths of flowers laid upon it. Mr. Bubb had been in the service of Mr. Pearson from boyhood. Amongst the principal works he had carried out is a church at Speke, near Liverpool; St. John's Church, Red Lion-square, Holborn; and St. John the Baptist Church, Dartington, Devon. Mr. Robert Swaine, who has been acting as Mr. Pearson's new Church of St. John, Norwood, opened on Monday last (May 22), will take Mr. Bubb's place. The choir is now built up some 25 ft. to 30 ft. above the nave floor-line.

**The Bute Docks, Cardiff.**—The preamble of the Bute Dock Bill has been proved before a committee of the House of Lords. The profits of the docks during the last twenty-seven years have only been 34 per cent., but the value of Lord Bute's land in the vicinity of the docks has been increased to a fabulous extent. The present lord and his father have (according to the *Mining Journal*) spent two millions and a half of money on the docks, and it is proposed to spend another 500,000*l*. on the Roath Dock, for which powers are now being asked to enable the work to proceed.



## BUILDERS' BENEVOLENT INSTITUTION.

The fifty-seventh election of pensioners on the funds of this Institution took place on Thursday, the 25th inst., at Willis's Rooms, St. James's, Mr. Thomas F. Rider, vice-president, in the chair. For the four vacancies which existed there were six candidates, whose names, and the number of votes they received, were as follows:—William Adams, aged 63, 340 votes; John Cooper, aged 79 (second application), 1,672 votes; Robert John Dutton, aged 60, 175 votes; James Keyes, aged 77, 988 votes; Jonathan Parsons, aged 67 (second application), 986 votes; and Charles Wood, aged 60, 209 votes. The successful candidates were therefore declared to be Messrs. Adams, Cooper, Keyes, and Parsons. Votes of thanks to the scrutineers, checkers of votes, and chairman, were moved, seconded, and adopted, the gentlemen taking part in the proceedings including Messrs. Thos. Stirling, T. G. Smith, W. Scrivener, — Head, and Crutenden.

## STREET VENTILATION.

SIR,—I observe that in your issue of the 13th inst. some very simple and well-recognised principles as to the necessity of arranging streets, where practicable, so that they shall be well ventilated, are founded upon some alleged statistical facts as to the prevalence of heart disease and dropsy in certain conditions, which are of a much more doubtful character. Most persons who have any practical acquaintance with returns of deaths, especially in large districts, where opportunities exist for comparing the values of these documents, know how utterly unreliable are the statements which they contain as to these two causes of deaths in particular. Apart from the considerations that dropsy is in all cases only a collateral symptom, and never a primary cause of death, that both it and heart disease may be due to a variety of causes, and that the term "heart disease" is itself so vague as to have no definite value at all, it is within my own experience at least that the use of these terms is very much a matter of intellectual idiosyncrasy on the part of the certifying doctor. Some doctors see heart disease in most of the persons they attend, especially in the case of elderly people, whilst others are more discriminating in their diagnosis, and look behind the heart symptoms to their causes. Hence it may happen that in the same locality the death certificates of one doctor might indicate an alarming prevalence of heart disease, whilst those of another would show only a normal quantity. How utterly absurd, then, it is to attempt to base any trustworthy generalisations upon such unsubstantial foundations as these. I have no hesitation in saying that any inferences as to the prevalence of heart disease or dropsy drawn from the records of mortality as they are available at present, are not worth the paper on which they may be written.

A MEDICAL OFFICER OF HEALTH.

## LOCAL GOVERNMENT BOARD APPOINTMENTS.

SIR,—Will some one kindly inform me whether a Local Board have the power to appoint a clerk of works on sewerage works, and whose appointment has to be verified by the Local Government Board, without the appointment being duly advertised; or whether it is competent for a Local Board to appoint any one, and in any manner (as a clerk of works) they may please, and at the high salary (for a town of 5,000 inhabitants) of three guineas per week, well knowing that the person appointed has private practice as an architect and surveyor in two places, as well as another public appointment.

Also whether, when a member of a Local Board gives notice that at the next monthly meeting of the Board he shall propose the name of a certain person for the appointment of clerk of works, at a special meeting a fortnight after notice has been given, the Board can legally make such appointment, and thus frustrate the intentions of ratepayers from protesting against such an appointment being made without a person being advertised for to devote his whole time to the duties required?

J. R.

The Prince and Princess of Wales have kindly consented to open, on the 25th of June next, the Convalescent Home for Poor Children, which has been erected on West Hill-road, St. Leonard's-on-Sea. Messrs. Fowler and Hill are the architects, and Mr. C. Hughes, of St. Leonard's, is the builder.

## GARSTON WESLEYAN CHURCH, BANKS ROAD.

New premises being required, the trustees requested the architect of their old building to compete for the new building with the "Inspector of Nuisances" to the Local Board, which distinction the former having declined, plans by the latter were at once accepted, together with estimates, amounting to nearly 14,000l.

The following memoranda from the plans, &c., will be enough to give an idea of the proposed structure:—Proportion much very short. Trauspts (the entire width of the site) deep and narrow, and what are called the "isles" 3 ft. wide. School-room behind the chapel only 29 ft. by 20 ft., and yet 26 ft. high, whilst the span of the roof is lengthways to the room, and the light only from a dormer at each end, the eills of which are about 14 ft. above the school floor. Infants' room adjoins the school-rooms, and has large folding door or screen between, the windows on one side opening principally into the boiler room, the upper portion only being free to the light and air. There are also six small class-rooms and keeper's cottage, three of the former entered only from the schoolroom, and two lighted from the roof; class-rooms and schoolroom alike being entered from passages but 3 ft. wide, and some of the inner doors are to have one or more steps in the openings. What, however, is very remarkable as emanating from the Local Board's "Inspector of Nuisances" is the fact that all the school-yard and w.c. space consists of passages 3 ft. wide or thereabouts, an arrangement eminently calculated to secure the permanent attention of the official in question.

ARCHITECT.

## PROVINCIAL NEWS.

Preston.—In the course of last year the Manchester and County Bank purchased a site for a new bank in Church-street, nearly opposite the Town-hall, adjoining the Legs of Man Hotel, and extending some distance down Main-street. The designs for the new building have been prepared by Messrs. Mills & Murgatroyd, architects, of Manchester. The building will cover about 400 square yards of land, and will have a frontage of 41 ft. 6 in. to Church-street. It is intended to provide not only apartments for the business of the bank, but also a residence for a clerk or caretaker: hence the main front will be three stories towards the street, and carried to a height of about 48 ft. above the footpath. The style chosen is late Tudor, verging on Jacobean. The contract for the building has been let to Messrs. R. Neill & Sons, of Manchester.

The new County Offices are approaching completion. They are intended to provide requisite accommodation for the several departments of the clerk of the peace, the treasurer, the auditor, and other officials engaged in county business, besides the several offices for these departments. The buildings in course of completion have a frontage towards Fishergate of 57 ft., and towards Pitt-street of 152 ft., exclusive of an adjacent small building in that street intended for a residence for a caretaker. Including this building and an intervening gateway, the extent of frontage in Pitt-street is 184 ft. Towards Fishergate the façade is continuous, and groups with that of the head-quarters of police. The Pitt-street façade is similar in character, but somewhat differently treated. The character of the design is a modification of the style prevailing in this country in the reigns of Elizabeth and James I., partaking rather of that known as Jacobean than of that of the earlier period. It is simple in detail, the external faces of the wall being of red pressed brick, with stone strings, cornice, window-quoins, mullions, and other dressings. In order to utilise to the greatest advantage the area of ground afforded by the site, an open inner court is formed, around two sides of which offices and other apartments are grouped. On the first floor a court-room is provided, 62 ft. by 45 ft., and 36 ft. high, with an open timber roof in character with the style of architecture of the building. The court is lighted by a lantern-light in the roof, and by large windows with semicircular heads, having stone mullions and transoms. These it is proposed to glaze with lead-lights of suitable design, containing some heraldic glass by Messrs. Shrigley & Hunt, to whom it is intended to entrust the decorations of the walls and the roof of the court. The floors of the corridors and the record rooms are carried on brick arches, the corridor floors being laid with marble concrete of a grey tone by Mr. Oppenheimer. The court and the corridors are warmed by hot-water pipes, the apparatus in use being that of Messrs. Metcalf & Dilworth, of Preston, with their patent boilers. Mr. John Walsley, of Preston,

is the general contractor for the erection of the building; Messrs. David Tullis & Son have done the mason's work as sub-contractors to Mr. Walsley; Messrs. Walsley & Co. have done the plumbing, plastering, &c., also as sub-contractors. The furniture for the building is being provided by Messrs. Bell & Conpland, of Preston. The total expenditure on the County Offices will be 25,000l. of which 2,500l. is for the land. The Constabulary Offices cost 19,000l. Thus the cost to the county of the entire block is 44,000l.

Chard.—At the quarterly meeting of the Chard Town Council, the mayor (Mr. Sumner Toms) proposed that a Corn Exchange should be provided for the town. He anticipated that the corn dealers and those interested in the sale and purchase of corn would receive the proposal with thanks, and the market would be thereby much improved. A movement is on foot with the corporation to build a large public hall for the town, which will be utilised for all public purposes, and the cost of which will be nearly 1,000l. The proposed Corn Exchange will be built in connexion with the same scheme, a committee being appointed to obtain plans and specifications, &c.

## Books.

Die Sicherheit der Person im Theater. By Prof. A. PROKOP. Brünn: R. M. Rohrer. 1882.

This is a reprint, in pamphlet form, of a series of articles which appeared originally in the *Österreichische Verbands-Feuerwehr-Zeitung*. The safety of theatre-goers is being generally treated, and a great deal that has been said by M. Fölsch and others on the subject is here repeated. The practical part of the pamphlet, dealing with the construction of theatres, also travels over much of the same ground. The little work is a good résumé of all that has been written on the question. It includes a number of plans and sections of existing theatres, together with details of iron curtains.

## Miscellaneous.

Suggested Duplex Bridge over the Thames.—Last week a number of gentlemen assembled by invitation at the offices of Mr. Grace, Nicholas-lane, Lombard-street, for the purpose of inspecting the model of a patent duplex bridge proposed to be erected over the Thames east of London Bridge. The plan is substantially the same as was shown a few years ago when the question was before the public. Such a bridge would, it is urged, insure uninterrupted continuity of vehicular and general traffic, at the same time affording facility for passing the largest ships and steamers with highest masts to and from the wharfs between it and London Bridge. The vessels would be admitted at either end, whilst the road-traffic would be diverted only for a few moments, when the swing portion of one end of the structure would be opened or closed; but in no case would the traffic be stopped; and even a diversion would be comparatively rare, as it was stated that the average number of ships which would pass during the day was not above sixteen. The height of the bridge above high-water mark would be 29 ft. 6 in., the roadway would be 60 ft. wide; the gradients on the north side 1 in 100, on the south side 1 in 35 at present, but when Bermondsey improvements are effected will be about 1 in 45. The material is proposed to be iron and steel. The width of the waterway for high-masted vessels would be 50 ft. or more, up to 70 ft. if required; the length between the swing-bridges would be 300 ft., but would admit longer vessels; the height of the bridge at high water, under any navigable part, would be about 29 ft. The cost, it is estimated by competent persons, would be under 400,000l., including the bridge and its approaches.

International Electrical Exhibition at Vienna.—It is proposed to hold, this autumn, an electrical exhibition at Vienna, the Rotunde, in the Prater, having been placed by the Austrian Government at the disposal of the influential committee which has been formed. The leading electricians of Austria, Belgium, England, France, Germany, and Holland, have promised their support. A member of the Vienna committee will shortly arrive in London to make the necessary arrangements with intending English exhibitors.



**Society for the Encouragement of the Fine Arts.**—A lecture, by Dr. Fuené, on "Historical Outlines traced in Early Art Symbolism," was delivered at No. 9, Conduit-street, on the 25th of May. The lecturer approached his subject in the first instance by illustrations of art symbolism in connexion with recorded historical events. Taking a few letters of several Oriental alphabets, and showing from their original names and forms that they were merely the outlines of weapons, or pastoral or domestic objects, names of trees, boats, &c., he proceeded to point out that the indications they gave of warlike, pastoral, maritime, arborescent, or other occupations of the people using such alphabets, were supported by historical accounts of those nations. Thus, the Assyrians were warlike, the Egyptians contemplative, the Phœnicians were navigators, the Irish dwelt in primeval forests, &c. Taking a secondary view of the same letters, he showed how they represented the forms and emblems of their deities, and, in some cases, of their worship. Thus the circle would be the sun, the eye of God, and eternity, the great O (Ω), A (Aleph) representing a head of horned cattle, became the horns of Astarte or Isis, and followed by B (Beth), the house, became Beth-el, the House of the God, &c. The hieroglyphics, as indicated by the name, represented the objects of worship in animal, vegetable, and mythological existences, astronomical, and probably other scientific formulae. Passing on to their architecture, he showed the sedate, sombre disposition of the Egyptians in their heavy style and gloomy retreats, telling throughout of the tomb; and the daring aspirations of the Greeks. These features exhibited the characters of each people.

**The London Unemployed.**—The Committee in course of formation for the benefit of the unemployed in London met in conference on the 22nd of May, at the Cannon-street Hotel. Lord Thurlow occupied the chair. Some twenty fresh letters of sympathy from gentlemen of position were laid on the table, and ten fresh names were added to the Committee, including three peers and three members of Parliament. Lord Thurlow made some remarks on the condition of the masses, and pointed out at least the impossibility of this country feeding its own people by home produce. Emigration was, he said, the only cure, and he was in favour of State emigration, but feared that it would not be brought about yet. His opinion was that a self-supporting association would work well, and he was studying a scheme which he hoped soon to submit to the Committee. His communication with the Canadian Government was highly satisfactory. Several clergymen and ministers having spoken, the Committee adjourned until after the Whitsuntide holidays.

**Proposed New Workhouse Accommodation for the Holborn Union.**—Allusion has lately been made to the extremely unsatisfactory condition of the old buildings of the Holborn Union in Gray's Inn-road. We now learn that a meeting of the General Purposes Committee of the whole Board of Guardians has been held, at which Mr. H. Saxon Snell, the architect, submitted plans which were approved for the erection of new buildings at the City-road workhouse, to provide accommodation for 528 inmates at a cost of 15,840*l.*, and a dining-hall to hold 650 at a cost of 3,000*l.*, making a total of 18,840*l.*, exclusive of the furniture, &c., but the sudden break-up of the Board at their meeting last week,—a break-up resulting from "a scene" of great disorder arising through a personal matter,—prevented the subject from being brought forward.

**Lead Poisoning.**—Dr. Rennett, of Frankfurt, has been making investigation into the hygienic condition of eleven families, with seventy-nine children, living in a village in Hesse, where the larger part of the inhabitants are employed in the glazing of earthenware, and who suffer largely from chronic lead poisoning. He attributes to this cause the high mortality, amounting to 50 per cent., of the children during the first five or six years of life; the survivors suffer from hydrocephalus, an enormous size of the head.

**Radcliffe.**—The Co-operative Society is now engaged in extending their boundaries by erecting a new branch store at Chapelfield. They are also about to build fifty new houses, which they will sell to their members on deferred payments. The architects are Messrs. Maxwell & Tuke, of Princes-street, Manchester, who erected the central store a few years ago at a cost of over 13,000*l.*

**Remarkable Charge of Fraud.**—At the Highgate Police Court, Mr. James Wesley Reed, calling himself an architect and surveyor, of Tollington Park, Hornsey-rise, was charged with obtaining 17*l.* from Mr. Henry Cooper, builder, of Finchley, on the pretence that Mr. Cooper was employed by him, as agent for one Williams (whose Christian name the defendant said he did not know), to build a house at Barnet for 1,383*l.*, whereas no house was intended to be built. Mr. Wells, solicitor, prosecuted; Mr. Williams, solicitor, defended.

Mr. Wells said at the end of last year or the commencement of this, Mr. Cooper was applied to by the defendant to know if he would tender for the erection of a house at Barnet Common. If he would, he was to send 5*s.* to him for the bill of quantities. Mr. Cooper replied that he would tender, sent the 5*s.*, and duly received the bill. At the foot of the bill it was stated that the surveyor's charges for the quantities would be two per cent., to be paid out of the first instalment, and 5*l.* 5*s.* in addition for incidental expenses. On January 17th last, Mr. Cooper delivered the tender to Mr. Reed. He did not hear from the defendant until February 21st, when the defendant informed him that his tender for 1,383*l.* was accepted. Mr. Cooper asked him for whom the house was to be built. The defendant replied that it was for a client of his named Williams. Mr. Cooper remarked, "I suppose he is all right," to which the defendant replied, "He is a very good man indeed." After advancing 17*l.* on account of the payments for quantities, Mr. Cooper discovered that no such house was to be built. The Bench committed the defendant for trial at the June Sessions of the Central Criminal Court, but agreed to accept bail, himself in 40*l.*, with two sureties in 20*l.* each, or one surety in 40*l.*

**"Great Paul."**—Just before going to press on Thursday evening, we made inquiries at St. Paul's Cathedral as to the progress made towards getting the great bell into its destined position. We found that it had been got fairly inside the doorway of the tower (with only about half an inch to spare, after cutting away the masonry at the bottom of each side of the door), and that, still on its wooden platform, it was being pushed by powerful screw-jacks up the inclined way (necessitated by the rising of the arch of the crypt) to the centre of the lower landing of the great staircase. This position it was expected to reach an hour or two later. The two ropes, each 6 in. in circumference, and which have been lent by the authorities of H.M. Ordnance Department, Woolwich, are, with the other tackle and appliances required, in position ready for hauling up the bell, which operation is expected to be commenced this (Friday) morning, the 26th, and to last from eighteen to twenty-four hours. The operations are being carried out under the superintendence of Mr. F. C. Penrose, the surveyor to the Dean and Chapter, who has been unemitting in his anxious labours. Mr. Taylor, of Longborough (a member of the firm from whose foundry the bell comes), is also present to render help.

**Royal Italian Opera House.**—A genuine delight was expressed by a very crowded house on Monday last with the opera "Mignon," as produced at Covent Garden. Madame Albani (*Mignon*) was truly in full song, and well deserved the applause bestowed. Her acting also was in good keeping with her vocalisation. The lateness of the hour when the opera would terminate was no doubt the reason why mere *encores* were not enforced. We must also offer a word of praise to Madame Valleria (*Filina*), and also to M. Gailhard (*Lotario*). There appeared a nervousness on the part of Signor Lestellier (*Guglielmo*) which caused a weakness in his voice. The opera was well mounted, but the dance of the Gipsies might be improved. The main interest, however, on Monday evening centred in the *Mignon* of Madame Albani, which was a truly delightful performance.

**King v. The Mayor, Corporation, &c., of Leamington.**—On this special case being called on, in the Queen's Bench Division of the High Court of Justice on Tuesday last (before Mr. Justice Manisty and Mr. Justice Watkin Williams), Mr. Webster, Q.C., on the part of the plaintiff, was happy to inform the Court that an arrangement had been come to between his learned friend, Mr. Mellor, Q.C. (who appeared for the defendants) and himself, and judgment would be entered by consent for the plaintiff for 1,000*l.*, each party to pay their own costs. The action was brought to recover the balance of an account for and labour done, &c., under a contract to erect waterworks at Leamington. The defendants contested their liability on the ground that the contract was not under seal, and judgment was so entered accordingly.

**Queenborough Pier, near Sheerness, the property of the London, Chatham, and Dover Railway Company, by whom it was used for their Continental traffic via Flushing, was totally destroyed by fire on the afternoon of the 19th inst. The cost of the pier is stated at 60,000*l.* Unfortunately, one of the employees of the Company, named Harry Histed, met his death in the disaster. At the inquest held on his body, evidence was given to show that the fire originated under the baggage-room, but there was nothing to show how it occurred. There was no luggage in the room, and there were no inflammable goods on the pier. The inquest was adjourned for a week.**

**Diachromos.**—This is the name given by Mr. Henry Chalk Webb to the results of his patented invention for staining wood, for the sale of which a limited liability company, with offices at 43, Finsbury-pavement, has been formed. The invention consists in so staining wood as to resemble specimens of hand-painting or inlaid wood, at one-fourth the cost of the latter processes. As the name signifies, the colour perforates the wood, rendering it practically indestructible. It is applicable to every species of decorative household furniture. It is especially suitable for flooring, and contracts have already been entered into for thus ornamenting two churches, besides many banks and other buildings.

**Helliwell's Patent Roof Covering.**—The weak places in roofs covered with corrugated or plain galvanised iron sheets are where holes are punched in them for the rivets and nails used for fixing them; the metal there begins to corrode and wear away. By Mr. Helliwell's new patent system none of these holes are required, and these materials may be used in many cases in lieu of slated roofs with much advantage. The system adopted seems a very good one. It allows for contraction and expansion, and the work can be easily taken to pieces for removal.

**The Mersey Tunnel.**—On Tuesday, the Select Committee of the House of Commons sanctioned a Bill for the construction of a railway on each side of the river in continuation of the tunnel. The railway on the Liverpool side will pass from its connexion with the tunnel, under St. James-street, Lord-street, and Church-street, and form a junction with the Midland Central Station. On the Birkenhead side the railway from the tunnel will form a junction with the Chester and Birkenhead line, the joint property of the London and North-Western and Great Western Companies.

**The Leamington New Theatre.**—The memorial stone of a new theatre at Leamington has been laid by Lord Brooke, M.P., in the presence of a large assembly of spectators. The new building is in Regent Grove, near the Holly Walk. Messrs. Osborn & Reading, of Bennett's Hill, Birmingham, and Mr. Phipps, London, are the architects; and Mr. John Fell, of Bedford-street, Leamington, is the contractor. The contract is for a little over 7,000*l.*, and it is intended to open the theatre early in the autumn.

**Blythburgh Church, Suffolk.**—An endeavour is being made to raise funds for saving this church. It is in the eastern part of the county of Suffolk. The secretary of the committee writes,—"It is one of the finest specimens of semi-Florian thirteenth-century architecture in this country, and the committee seek the assistance of those who would regret to think that such a fabric should become a ruin, and this will be inevitable in the course of a very short time unless an immediate effort be made to avert such a catastrophe." Mr. A. W. Blomfield, M.A. has been spoken to on the subject.

**Liverpool.**—At the meeting of the Mersey Docks and Harbour Board, on the 11th inst. Mr. Guion stated that the pressure on the Board's accommodation for vessels was unprecedented, and notwithstanding the large area of dock accommodation recently opened at the north end of the city by the Prince and Princess of Wales, the Board was still short of the space that was required at their hands. Under these circumstances it had been arranged that the Hercules Dock should be devoted to the use of shipowners pending the decision of the Board as to deepening it.

**The Female School of Art.**—The prize gained by the students of this school were distributed by Sir Phillip Canliffe Owen on Wednesday last. We will give some particulars in our next.



**Alleged Jobbery in the Rotherhithe Vestry.**—Readers of local journals published in the suburbs of London are but too familiar with the reports of unruly proceedings at the meetings of vestries, boards of guardians, and other authorities. The Rotherhithe Vestry has acquired an unenviable pre-eminence for disorderly "scenes," and therefore not much weight will not be attached to the insinuations made against the surveyor of that body at its last meeting. Referring to the St. Helena Gardens Estate, Mr. Williams charged a member of the Vestry with instructing the surveyor to look after his interests in reference to this estate. At a later period in the proceedings, Messrs. Finney, Bruff, & Co., appeared before the Vestry with plan and application to build on the St. Helena Estate. Mr. Hames said they (Messrs. Finney, Bruff, & Co.) had obtained the sanction of the Metropolitan Board to their proposal, but that sanction had been afterwards withdrawn through the influence of the surveyor of that parish.—Mr. Legg said the Board were not aware that they (the applicants) were proposing to enclose a part of the public right of way. Some mutual recriminations having taken place between Mr. Hames and Mr. Legg across the aisle, Mr. Williams charged Mr. Legg with acting for a member of that Board in order to make his property more valuable.—Mr. Legg said the fact of the matter was that Mr. Williams was suffering from pique because he could not obtain what he wished in reference to property in which he was interested.—Mr. Hames said Mr. Bulmer had written to him, stating that Mr. Legg represented him in a certain piece of land.—Mr. Bulmer said the facts of the case were very simple. When Mr. Bruff purchased this property (St. Helena Gardens), he wrote to him (Mr. Bulmer) stating that he wanted to buy a piece of land in his possession. He (Mr. Bulmer) saw Mr. Hames, and showed him the piece of land. They could not agree as to price. He made an offer for an exchange, which he (Mr. Bulmer) did not think was a satisfactory exchange, and offered him a price which he could not take. Finding he could not come to terms himself, he told Mr. Hames that he had placed the matter in the hands of Mr. Legg, and if he could agree with him, he (Mr. Bulmer) would be satisfied. That was a business transaction, and nothing more.

**The Architectural Association.**—At the meeting of this Association on the 19th inst., Mr. E. G. Hayes was nominated as President for session 1882-83.

## TENDERS

For the erection of school-buildings, Old Bedford-road, Luton. Messrs. J. R. Brown & Humphreys, architects. Quantities by the architects:—  
W. Dunham, Luton ..... £1,400 0 0  
Friesley & Gurney, London ..... 1,375 0 0  
Underwood, Wellingborough ..... 1,361 0 0  
Twelvetree, Biggleswade ..... 1,365 0 0  
White, Dunstable ..... 1,354 0 0  
Bass, London ..... 1,345 0 0  
Jones & Co., Gloucester ..... 1,338 0 0  
Foster, Bedford ..... 1,241 0 0  
Robinson, Dunstable ..... 1,239 0 0  
Ireson, Northampton ..... 1,229 0 0  
D. Dunham, Luton ..... 1,221 0 0  
Redhouse, Baldock ..... 1,191 0 0  
Lissman, Leamington ..... 1,170 0 0  
Smart Bros., Luton ..... 1,160 0 0  
Spencer, Atherstone (accepted) ..... 1,120 0 0

For the erection of school-buildings, Hitchin-road, Luton. Messrs. J. R. Brown & Humphreys, architects. Quantities by the architects:—  
Friesley & Gurney, London ..... £4,570 0 0  
Twelvetree, Biggleswade ..... 4,478 0 0  
W. Dunham, Luton ..... 4,375 0 0  
Underwood, Wellingborough ..... 4,369 0 0  
White, Dunstable ..... 4,285 0 0  
Foster, Bedford ..... 4,285 0 0  
Ireson, Northampton ..... 4,195 0 0  
Jones & Co., Gloucester ..... 4,190 0 0  
D. Dunham, Luton ..... 4,040 0 0  
Redhouse, Baldock ..... 4,038 0 0  
Robinson, Dunstable ..... 3,913 0 0  
Smart Bros., Luton ..... 3,900 0 0  
Lissman, Leamington ..... 3,881 0 0  
Spencer, Atherstone (accepted) ..... 3,670 0 0

For rebuilding the Wyndham Arms, Windmill-lane, Emswold, for Messrs. Watney & Co. Mr. C. W. Bovis, architect:—  
Patman & Fotheringham ..... £4,473 0 0  
Anscombe & Co. ..... 3,980 0 0  
Spencer & Co. ..... 3,887 0 0  
Taylor ..... 3,847 0 0

For alterations to the Victoria public-house, Chalfont, Bucks. Messrs. J. R. Brown & Humphreys, architects. Quantities by the architects:—  
Spencer & Co. ..... £2,675 0 0  
Jackson & Todd ..... 535 0 0  
Pitts & Co. ..... 418 0 0  
Lamble ..... 412 0 0  
Stead, Bros. ..... 372 10 0

For making new roads and sewers on the Hengistbourne Estate, Boscombe, for the Boscombe Conservative Co-operative Land and Building Society, Limited. Mr. R. G. Finner, surveyor:—

	Roads.	Chalk.	Keeling and Gutting.	Sewers.	Twenty-one Cutchpits.	Manhole.	Yardland Shuts (each).	Concrete Casing, per yard run.	Total.
H. Pond .....	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Hoar Bros., & Welden .....	272 0	102 10	271 8 3	474 2 2	43 0 0	6 6	2 3	5 0	1,170 13 6
W. H. Saunders (accepted) .....	390 0	139 0	303 9 4	221 18 0	61 18 8	9 6	2 0	2 8	1,128 14 8
W. H. Saunders (accepted) .....	199 5	100 10	299 3 4	179 0 0	47 5 0	10 10	2 0	4 0	838 2 4

For additions and alterations to printing and lithographic works in Tonic-street, Hanley, for Messrs. Albert & Daniel, Messrs. Kates & Bradford, architects. Quantities by the architects:—  
J. F. Ledoux, Hanley ..... £1,173 0 0  
T. Godwin, Hanley ..... 1,158 0 0  
J. Roberts, Hanley ..... 1,100 0 0  
O. Cornes, Hanley ..... 1,099 17 6  
J. Gallimore, Newcastle-under-Lyme ..... 1,035 0 0  
H. & R. Insip, London ..... 1,035 0 0  
J. T. Clark, Hanley ..... 1,010 0 0  
J. Grosvenor, Tunstall ..... 950 0 0  
E. Gibson, Tunstall (accepted) ..... 844 8 0

For the erection of two houses, Regent-road, Great Yarmouth, for Mr. J. N. Arton. Messrs. Bottle & Olley, architects:—

**Bricklayer's Work.**  
J. Harbord ..... £900 0 0  
T. Howes ..... 658 0 0  
W. House ..... 615 10 0  
Beech & Cork (accepted) ..... 620 0 0

**Carpenter's Work.**  
Springall ..... £384 0 0  
Ward ..... 397 0 0  
Isaac ..... 373 0 0  
Bray ..... 349 0 0  
Darey ..... 340 10 0  
Harbert (accepted) ..... 291 0 0  
Kingsley ..... 258 10 0

**Plumber and Painter's Work.**  
Rainer ..... £62 18 0  
Green ..... 60 18 0  
Dyson (accepted) ..... 46 19 0

For making up Carlisle-road and Lancaster-road South, for the Horney Local Board. Mr. T. De Courcy Meade, surveyor:—

**Carlisle-road South.**  
Strachan & Co., Wood-green ..... £212 10 0  
Dunmore, Crouch-end ..... 93 0 0  
Pizzey, Horney ..... 85 0 0  
Hawkins & Son ..... 80 0 0  
Bloomfield, Tottenham ..... 78 3 0  
Jackson & Son ..... 79 0 0  
**Lancaster-road South.**  
Strachan & Co., Wood-green ..... £219 0 0  
Dunmore, Crouch-end ..... 197 0 0  
Pizzey, Horney ..... 165 0 0  
Hawkins & Son ..... 165 0 0  
Bloomfield, Tottenham ..... 168 8 0  
Jackson & Son ..... 159 12 0

For building a villa residence at Woodford Walls, for Mr. D. Schwagerl. Mr. Edward Brown, architect:—  
Marr ..... £1,335 0 0

For alterations at the Bear's Head, Stratford, for the Alma Brewery. Mr. Edward Brown, architect:—  
Belcher & Ulmer ..... 350 0 0

For proposed new mission hall, Earle-road, Liverpool, comprising large hall to seat 500 people, with class-rooms, &c., and with octagon spire, covered with oak shingles. Mr. James W. Crofts, architect. Quantities by Mr. J. B. Bardsley:—  
Roberts & Robinson ..... £3,245 0 0  
Hughes & Stirling, Bootle ..... 2,992 0 0  
R. Ritchie, Birkenhead ..... 2,903 9 0  
W. H. Forde, Birkenhead ..... 2,870 0 0  
E. Gabbutt ..... 2,855 0 0  
Blackley & Son, Birkenhead ..... 2,800 0 0  
W. Tomkinson & Sons ..... 2,797 0 0  
J. Reddie, Emsbury ..... 2,720 0 0  
J. Henshaw ..... 2,648 0 0  
H. Yates ..... 2,633 0 0  
Brown & Brockham ..... 2,628 0 0  
T. Tyson ..... 2,628 0 0  
Thornton & Sons (accepted) ..... 2,685 0 0  
Nicholson & Ayre (accepted) ..... 2,478 13 6

For the construction of tramways between the pier and Tyne Docks, a distance of 2½ miles, the total length taken at a single line being 3½ miles, gauge 3 ft. 6 in., for the Corporation of the borough of South Shields. Mr. Matthew Hall, borough engineer:—  
J. Gowan, Edinburgh (accepted) ..... £12,244 1 6

For office-fittings of the Bedford branch of the London and County Banking Company, Limited. Messrs. Usher & Anthony, architects:—  
Rider & Son ..... £320 18 0  
Wells & Co. (accepted) ..... 254 8 0

For alterations and additions to the South Norwood Board Schools for the Croydon School Board. Messrs. Rutley & Blackwell, architects. Quantities supplied:—  
R. Ward ..... £2,363 0 0  
J. & C. Bowyer ..... 2,298 0 0  
Maiden & Harper ..... 2,287 0 0  
Howard Bros. ..... 2,246 0 0  
Heale & Son ..... 2,178 0 0  
Castle ..... 2,170 0 0  
Martin Taylor ..... 2,138 0 0  
Marriage ..... 2,040 0 0  
Page ..... 1,910 0 0  
Hollidge & Stuart ..... 1,847 0 0  
Smith & Sons (accepted) ..... 1,818 0 0

For alterations and additions to residence and farm buildings at Chelham, Surrey, for the Rev. S. B. Crowther-Doyon. Messrs. Rutley, architects:—  
R. Ward ..... £600 0 0  
R. G. Battley ..... 594 0 0  
Hunter & Bryant ..... 551 0 0

For residence on the Bayhorse Estate, Horley, for Mr. R. B. Evered. Messrs. Rutley, architects:—  
J. & C. Bowyer ..... £2,945 0 0  
R. G. Battley (accepted) ..... 2,724 0 0

For the erection of new premises in Broad-street Reading, for Mr. John Belcher. Messrs. Brown & Albury architects:—  
Higgs ..... £2,850 0 0  
Denton ..... 1,789 0 0  
Simonds ..... 1,779 0 0  
Lewis ..... 1,769 0 0  
Kingerlee ..... 1,689 0 0  
Wernham (accepted) ..... 1,650 0 0

For the erection of new show room in rear of Nos. 108 and 109, Broad-street, Reading, for Messrs. Heales, Sons & Co. Messrs. Brown & Albury, architects:—  
Sheppard ..... £1,369 0 0  
Woodroffe ..... 1,370 0 0  
Bottrell ..... 1,368 0 0  
Wernham ..... 1,148 0 0  
East & Sons ..... 1,148 0 0  
Kingerlee (accepted) ..... 1,085 0 0

For the erection of a residence at Milverton, Leamington. Messrs. Brown & Albury, architects:—  
G. F. Smith ..... £1,390 0 0  
W. Sissman ..... 1,197 0 0  
W. Gascoyne ..... 1,030 0 0  
R. Bowen ..... 893 0 0  
T. Mills (accepted) ..... 875 0 0

For additions and alterations to the "British Workman" Abbey-square, Reading, for A. Sutton, Esq. Messrs. Brown & Albury, architects:—  
Searle ..... £2,188 0 0  
Higgs ..... 2,070 0 0  
Weaver ..... 1,970 0 0  
Denton ..... 1,880 0 0  
Kingerlee ..... 1,868 0 0  
Strong Bros. ..... 1,830 0 0  
Bottrell (accepted) ..... 1,792 0 0

For alterations and additions at the Shirland Hotel, Shirland-road, Maida Vale, W., for Mr. Dickinson. Mr. George Treacher, architect. Quantities by J. F. Wesley:—  
Oldrey ..... £1,649 0 0  
Slater ..... 1,454 0 0  
J. Beale (accepted) ..... 1,290 0 0  
Chapman ..... 1,287 0 0  
**Prefering.**  
Ellen ..... £84 17 0  
Watts ..... 84 7 0  
Feather ..... 80 0 0  
H. T. Warren (accepted) ..... 68 0 0

For proposed residence for Mr. R. Green, Woburn. Messrs. E. W. Stephens, architect:—  
Timothy Godwin (Reading) ..... £3,375 0 0  
William Woodbridge (Maidenhead) ..... 2,891 0 0  
Silver Sons & Fildewood (Maidenhead) ..... 2,866 0 0  
George H. Gibson (High Wycombe) ..... 2,655 17 6  
Charles H. Hunt (Amersham Hill) ..... 2,673 0 0

For the erection of a Working Men's Club House in the Fyves, Acton, for the Rev. C. M. Harvey, M.A. Mr. Edward Monson, Jun., architect:—  
Henry Hunt, Barnes (accepted) ..... £874 0 0

For the erection of stabling, &c., at Brewery House, Hayes, for Mr. Joseph Shepherd. Mr. Edward Monson, Jun., architect:—  
William Hunt, Hayes (accepted) ..... £397 0 0

For building house, also stores, stable, cart sheds, &c., at Wellingborough, for Messrs. Truman, Hanbury, Duxton & Co.:—  
Underwood (accepted).

For the erection of a screen wall at No. 211, Marylebone-road. Mr. Robert Wiley, architect:—  
Outwaite & Son (accepted) ..... £239 0 0

For alterations at "The Poplars," Seven Sisters-road. Messrs. Gordon & Lowther, architects:—  
Phillips & Son ..... £2,185 0 0  
Patman & Fotheringham ..... 1,900 0 0  
Clarke & Bracey ..... 1,964 0 0  
Taylor & Parfitt ..... 1,859 0 0  
Little ..... 1,823 0 0  
Dye (accepted) ..... 1,700 0 0

For completing two semi-detached residences in Beaumont-road, Bedford Park Estate, Turnham Green, for Mr. Samuel Warde. Mr. Frank Goldring, architect:—  
Grover ..... £450 0 0  
Wright ..... 426 0 0  
Roberts (accepted) ..... 395 0 0

For the erection of the Royal Courts of Justice Chambers, in the Strand. Mr. Wemble and Mr. Goymour Outburt, joint architects:—  
Adamson & Sons ..... £53,446 0 0  
Hall, Beddall, & Co. .... 53,420 0 0  
Cole & Son ..... 53,298 0 0  
Brass ..... 53,219 0 0  
Scribner & Co. (accepted) ..... 52,978 0 0  
Fish & Co. .... 52,760 0 0  
McLachlan & Sons ..... 52,470 0 0  
Ashby & Horner ..... 51,898 0 0

For new infirmary, West Bromwich Union. Mr. W. Heenan, architect, Birmingham. Quantities by Mr. Chas. Henman, junr.—

H. Smith & Son, West Bromwich.....	£13,300 0 0
Bradbury & Co., Wolverhampton.....	13,215 0 0
J. Lowndes, Malvern.....	12,997 0 0
J. Smith & Son, Birmingham.....	12,980 0 0
Jaffery & Son, Birmingham.....	12,980 0 0
W. Bennett, Birmingham.....	12,753 0 0
W. R. Loxon, Birmingham.....	12,680 0 0
T. & H. Herbert, Leicester.....	12,550 0 0
G. H. Marshall, West Smethwick.....	12,514 0 0
J. M. East, Birmingham.....	12,490 0 0
W. J. Webb, Birmingham.....	12,391 0 0
J. Gaskill, Salford.....	11,858 0 0
R. Price, Shrewsbury.....	11,900 0 0
J. Jones & Son, Sedgley.....	11,715 0 0
C. A. Horton, Breckley Hill.....	11,688 0 0
W. F. Fennot, Birmingham.....	11,470 0 0
J. Mallin, West Bromwich.....	11,397 0 0
E. Gibson, Tunstall.....	11,340 0 0
Trow & Son, Wednesbury.....	11,196 0 0
C. Widdowson, Salford.....	11,060 0 0
Stockton & Son, Oldbury (accepted).....	10,800 0 0

For rebuilding Nos. 35, 37, and 39, Aldersgate-street, for Mr. B. Dorrington. Messrs. Taylor & Locke, architects; Mr. H. Lovegrove, surveyor.—

R. Conder.....	£10,028 0 0
----------------	-------------

For further additions to Christ Church Schools, Newcastle, for the trustees. Mr. Arthur Plummer, architect.—

Burnop.....	£391 12 0
Mitchison & Co.,.....	375 10 0
Burton.....	360 0 0
Southern.....	349 0 0
Bastion.....	345 6 0

For alterations and repairs to St. James's Church, Hampstead-road. Mr. Ernest Shum, architect.—

Langmead & Way (accepted).

For a manse, called Culyers, at Petersfield, for Lieut. Colonel Shuttleworth. Messrs. Bateman & Keates, architects. Quantities by Mr. Potter.—

Norris, Buntingford.....	£8,360 0 0
Colls & Son, Cambridge.....	8,222 0 0
Elliot, Newbury.....	7,522 0 0
Kimberley, Banbury.....	7,009 0 0
Brill & Sons, Southampton.....	6,921 0 0
Cook, Southampton.....	6,917 0 0

For the erection of the first portion of the infants' school, St. Andrew's, Plaistow, Essex. Mr. James Brooks, architect. Quantities supplied by Messrs. K. L. Curtis & Sons.—

Hearle & Son.....	£1,383 0 0
Cox.....	1,362 0 0
Orton.....	1,360 0 0
Morley.....	1,365 0 0
Reed.....	1,320 0 0
Gregory.....	1,320 0 0
Stann & Fotheringham.....	1,309 0 0

For bridge over the river Stour at Tuckton, near Christchurch, Hants, with approaches, for the Tuckton Bridge Company. Mr. Tom Stevens, engineer. Quantities supplied.—

Butler, Leeds.....	£1,100 0 0
Dixon & Thorne, London.....	4,037 0 0
Dyke, Biele, & Co., Newport.....	3,548 0 0
Perkins, Loughborough.....	2,984 0 0
Jones, Colston, & Co., London.....	2,904 0 0
Hearle Bros. & Walder, Bournemouth.....	2,637 0 0
Jenkins & Son, Bournemouth.....	2,738 0 0
Vernon & Ewart, London.....	2,760 0 0
Hill & Co., Gosport.....	2,750 0 0
Shaw & Co., London.....	2,465 0 0
Hayter, Portsmouth (accepted).....	2,200 0 0

For additions to factory at 128, New Kent-road, for Mrs. Thwaites. Messrs. Muggidge & Powell, architects.—

Riddell.....	£422 0 0
Burnan.....	369 0 0
Fisher (accepted).....	350 0 0

For alterations to shops, Nos. 33 & 35, York-road, Bath, for Mr. Marshall. Messrs. Muggidge & Powell, architects.—

Fisher.....	£240 0 0
Riddell.....	237 10 0
Burnan (accepted).....	214 0 0

For alterations at the Prince of Wales, Kentish Town, for Mr. Wells. Mr. Edward Brown, architect.—

W. Pringle.....	£497 0 0
Martock Bros.....	485 0 0
J. Oldis.....	449 0 0
H. Marr.....	425 0 0
Belcher & Ullmer.....	390 0 0
S. Salt (accepted).....	350 0 0

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J. G. Edwards.....	£21 0 0
R. Pringle.....	60 18 0
W. Rogers.....	54 3 0
T. Heath (accepted).....	54 10 0

For alterations and repairs at No. 94, Earl's Court-road, South Kensington. Mr. J. H. Rowley, architect.—

Asby.....	£272 11 0
W. H. Smith.....	230 0 0
Homann & Son.....	215 0 0
Lucas & Son (accepted).....	205 0 0

For repairs to premises, Leek-street, Leighton Buzzard. Mr. Frederick Gotte, architect.—

T. P. Webb, Leighton Buzzard.....	£430 0 0
W. Whiting.....	257 7 0
David Cook & Sons, Leighton Buzzard.....	239 0 0
Thomas Gibbs, Leighton Buzzard.....	213 10 0

For alterations to Nos. 48, 49, 50, & 51, Camelford-street, Wandsworth-road, for Messrs. H. & A. Phillips. Messrs. Muggidge & Powell, architects.—

Taylor.....	£277 15 0
Burman.....	954 0 0
Castle.....	914 0 0
Fisher.....	869 0 0
Tyerman.....	849 0 0
Whitty.....	814 0 0
Whitty.....	760 6 5

For rebuilding stabling at rear of King William the Fourth Tavern, Grosvenor-road, Piccadilly, for Mr. Thomas Barrett. Mr. Charles Jones, architect.—

Winsor.....	£187 10 0	Less.....	£7 0 0
Coulthard.....	436 0 0		28 0 0
G. T. Smith & Son.....	419 0 0		49 0 0
Hooper.....	314 0 0		34 0 0
Pickering.....	393 0 0		29 0 0
Heath (accepted).....	338 0 0		21 0 0

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# The Builder.

Vol. XLII. No. 2022.

SATURDAY, JUNE 7, 1902.

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### Potable Water and the Public Health.

FRIEND of the writer was riding over a mountain pass in Algeria, when a faint mist seemed to rise over part of the landscape. In a few seconds fair towns and villages, which had formed conspicuous features in the view, were no longer discernible. The rider rubbed his eyes, and thought he was dreaming;

he feared that he was struck with blindness, or with some new form of disease. But do all that he could, the fact was this,—the towns were gone!

A sharp, short shock of earthquake had taken place, of which the movement of the horse had prevented his rider from becoming aware, and the result had been the overthrow of the towns in question. It was not until he reached one of them, or, at least, its ruins, that the traveller was reassured as to his own perfect sanity.

It would be an over-statement to say that an equal effect was produced on our minds by the debate on the analysis of potable water at the Institution of Civil Engineers (of which a proof has just been issued, in anticipation of the next quarterly Journal of the Proceedings of the Institution). But those who have been, like ourselves, old supporters of sanitary reform, will share in our feeling of bewilderment at the form of the debate. It was not that science was contending with ignorance, grotesque as are the contrasts often presented in such a conflict. It was not that ignorance was contending with ignorance, of which we have instances yet more common and yet more droll. But it was science on horseback contending with science on horseback,—a sort of tournament in which all the knights were good, and all did their best, but no real aim of warfare was attained or proposed. Nay, it was worse than that. It was an academical debate, by able and educated men, in which two opposite views were supported, either of which, if established in its naked truth, would render it a hopeless question to obtain potable water except from the still.

We do not exaggerate. Nor do we think it easy to exaggerate the mischief that is done by the advocacy, on the part of able and learned men, of views that, whether founded on truth or not, their propounders can never have seriously attempted to fit to the possibilities of actual life.

"Chemists," said Mr. Folkard, the able writer of the very clever but equally unpractical paper discussed, are "powerless to help the sanitarian in discriminating between wholesome and unwholesome water." "Microscopists and biologists," he goes on to argue, are no better helps. "The only safe course, in the author's opinion, is to reject all sources of supply unless they stand the test of absolute freedom from organic substances so far as can be ascertained; or, preferably, of rigid examination by tracing the water from the time it falls to the earth as rain till it enters the reservoir or well." And where are these sources to be found for 4,000,000 of Londoners? Professor Tyndall said that "he had a cascade near a little house on the Alps, 7,000 ft. above the sea, and although it was charged with water coming from the snow-fields of the Alps, if he took a drop of that clear water and infected an organic infusion with it, in forty-eight hours the infusion would become putrid, and swarming with organisms." Alas for the pure flood of the Dora Grossa at Turin!

Dr. Tidy, on the opposite side of the question, "maintained that a distance of ten miles was sufficient for the purification of water under proper conditions" (p. 27). Thus, according to the debates on one side, river-water can never be, and can never be made, fit for human consumption. According to the opposite view, river-water is so naturally self-purifying that we are almost always safe in using it. And this is the year 1882! And these are chemists, doctors, microscopists,—men steeped to the lips in science! How is any one to survive? Or, rather, how is it that any one is yet alive?

The cause of sound and practical sanitary reform is seriously injured by the assertion of such extreme views; and that all the more so from the portion of truth with which they may be united. True, neither analysis nor the microscope can solve certain questions. But how many are there that they can and do solve? And what wisdom is there in underrating a mighty engine of science because it is not almighty? True that decomposing organic matter is wholly destroyed when brought in contact with an adequate dose of oxygen, and that nature has provided, in the fall of the cascade and in the rush of the torrent, a means of affording the requisite oxygen to the running waters. But does it follow that, when we have to deal, not with a peat-coloured mountain stream, but with an artificially restricted water-course, into which the civilisation of the nineteenth century throws abominations which the pagan of the time of Hesiod would have considered it to be a direct provocation of divine displeasure so to treat, we can expect nature to act as a manufacturer of Cond's Fluid, and to become at once scavenger and chemist? The absurdity of riding these notions to death, whether in the one or the other direction, becomes apparent on the slightest reflection. What practical aim do the advocates of those views propose in their enunciation?

There is one consideration which we would humbly request all persons who come forward with very sweeping principles on the subject of potable water to bear in mind. London must drink. Her enormous population, increasing at a rate which doubles itself in forty years, must have a certain quantity of water. How much will be required is not matter of vague estimate. In 1890 so many million gallons, in 1900 so many, in 1910 so many, the statistic can tell with the utmost precision, on the assumption that the rate of growth of the past half-century is maintained for the half-century that is to come. And the controlling consideration is this. We know what is the summer flow of the Thames at Gravesend. We know that that flow consists of all the water collected from springs, brooks, wells, rivers, or other sources within the area of the water-shed, which is not evaporated, or which escapes in a mode that has not yet been traced to the sea, whether this water has or has not passed through the animal system of man or of beast, as a certain portion of it certainly has done. And we know that the date may be fixed, and that not in a very remote future, when the whole of this water, so measured in its minimum discharge, will not be 30 gallons a piece for the inhabitants of the Thames valley. Whence is the supply to come for the future increment of the population? Where is the sense of picking here, and choosing there, and straining at a gnat in a third place, when we are likely to be face to face with a water famine?

We have before now referred to the subject of this actual limitation of the earth-springing waters of the London Basin, however they may be dealt with, and from whatever source they may be derived. It is no doubt a somewhat similar consideration that has led one projector to endeavour to tap the sources of the Severn, another those of the Wye, and a third to decant Ullswater lake into London cisterns. These great schemes, in spite of their cost, and their great political and military risk, have all the same fatal defect of limitation of yield, in face of progressive increase of demand. There remains but one source of supply which can be regarded as permanently adequate to the demand. Towards utilising that source, therefore, it behoves every practical man to turn his attention. And that all the more so because, seeing that in, let us say, 1950, it will be absolutely necessary to impound the rain-water, it is not a day too soon to begin the study of the best method of utilising it. We are providing for a certain want,—if the continued existence of London be regarded as certain,—and the moment that a true solution of the problem be arrived at, there will be a demand for the utilisation of the scheme.

One, two,—shall we say three?—centuries hence, if no convulsion or change in the order hitherto known intervene, life in London will be impossible if the inhabitants have not a good mode of impounding, rendering clear, brilliant,





and wholesome, the rain as it falls, and of doing, probably in minute detail, for this supply what Nature herself does in the provision of her purest fountains. Is it not somewhat foolish to lose time now in debating about tracing this brook to its source, or rejecting the water of that well,—all petty, individual, transitory details,—and leaving untouched the great master problem which will some day demand solution? While Dr. Thudichum wants "the water from the downs of Hampshire, filtered through hundreds of feet of chalk," while Mr. Homersham requires "uncontaminated spring water, derived from a considerable depth below the surface of the earth"; while Dr. Tidy sticks to the Thames, on the ground "that water purified itself in a running river he was as certain as he was of his own existence"; while Mr. De Rance "points out the utility of the construction of 'dumb wells';" while Mr. Robinson thinks a duplicate supply feasible and desirable,—the fact remains that each and all of these competing sources will shortly be quite inadequate to supply the wants of London. If, indeed, as Mr. Latham remarked, "as all sources of water supply are due to atmospheric causes, and as the author had stated that it was useless to look for purification by any mode which could be adopted by the engineer, such as filtration or percolation (because the germs could pass a thousand abreast through a filter); therefore, if the rain-water was impure at its source, how could it ever be purified?" What then? The only answer to this terrible dilemma,—which is, perhaps, a sufficient one,—is afforded by the census. People do live, and do drink water. But, apart from imaginary evils, the great question of quantity is assuming, or promises to assume, a no less serious aspect than that of quality; and it is to be regretted that a discussion such as that to which we have referred should have had so very little of a really practical bearing on this part of the subject.

#### HEATING, LIGHTING, AND WATER SUPPLY IN RUSSIA.

RUSSIANS are in some matters exceedingly conservative, and this applies in a marked degree to the mode of heating their dwellings. The apparatus used for that purpose throughout Russia by the middle and upper classes is still the so-called Russian stove, which is, however, a misnomer, as it is of undoubted Dutch origin, having been introduced from Holland by Peter the Great. It is a large clumsy brick structure, faced with common white glazed tiles, erected in one corner of the room, weighing from 1½ ton to 8 tons, and reaching almost to the ceiling, the fuel used being chiefly birch, pine, and fir. Yet the Russian stove is the most impractical, if not the least comfortable, of all the means by which human ingenuity has contrived to generate an artificial heat. So unsightly is it, that in the houses of the wealthy it is concealed as much as possible by mirrors and other articles of furniture. Then in the poorer dwellings there is the *tschoogonka*, something like an English ironing-stove, which is apt to get red hot, rapidly raising the atmosphere of the room to a suffocating heat, and as rapidly chilling it when the fuel is consumed. Great efforts have been made to arrange the Russian stove so as to be able to use pit coal or coke instead of wood, which is every year becoming dearer. On the authority of Mr. Piotzky, a member of the Russian Technical Society, and lecturer at that institution, there would be a great advantage in the use of mineral fuel, as he calculates that half a cubic fathom (7 ft.) of 14 in. wood-billets required for one stove per month can be substituted by 8 poods (1 pood = 36 lb. English) of English coal at 20 cop. per pood (31s. per ton), and one cubic fathom of firewood costing 20 roubles (60s.), answers to 80 poods of coal costing 16 roubles (48s.). In employing mineral fuel the above gentleman points out that the grate or fireplace should be of comparatively small dimensions, as when it is large, like in the old-fashioned stoves, the fuel does not concentrate itself in a heap, but becomes scattered and burns badly. He also recommends the adoption of hermetic doors, at the same time regretting their costliness in Russia, which precludes their coming into general use. It would therefore seem that there is a wide field open in Russia for some of our manufacturers with a practical invention of an inexpensive effective stove to be heated with coal or coke, and at

the same time answering the requirements of Russian taste.

The stove most in vogue in Russia for cooking purposes is what is called the *paitch*. It resembles the peasant's stove, which is something like a baker's oven. The cooking is done principally in sheet-iron baking-dishes, earthenware and common cast-iron pots; bread is also baked in the *paitch*. This is the real Russian stove, and dates from time immemorial.

In the capitals and the larger towns the cooking is done on a stove called a *plitha*. It is a thick iron plate, say 6 ft. long by 4 ft. wide, set in brick and faced with glazed tiles. There is no boiler, and only an oven at the side for baking. The doors, both of the fireplace and oven, are made of sheet iron. Altogether it is a very clumsy contrivance, and takes up a considerable space in the kitchen. The system of heating for cooking purposes is, like that of our own country, very extravagant, the arrangement of the *plitha* being such as to consume an inordinate quantity of fuel.

Modern heating apparatus include fireplaces and stoves, hot-air, hot-water, and steam calorifères, the methods employed for ventilation also coming under this head. In the province of heating by hot-water and hot-air, and ventilation on a large scale, a good deal has been done by the St. Petersburg Metal Works in establishments such as barracks, hospitals, churches, laundries, &c. All this work has been executed,—based upon scientific data,—with artificial moistening of the air, and with arrangements for regulating the supply of heat according to requirement. Baron Derscha has introduced heating by steam, with an invention of his own,—an electro-magnetic thermometer, which rings on a certain degree of heat being reached. In vogue are also calorifères of cast iron, of various constructions, copied from foreign models.

In the ventilation of the rooms of private houses little or nothing has as yet been effected. A system of ventilation, without draughts and exposure to cold, which would remove the noxious results of the excessive heating customary in Russia, would be much appreciated for the private dwellings of the enlightened classes. Among the stoves manufactured in this country, and which have found favour in Russia, may be mentioned the well-known Gurney stove, which has been adopted in several private and public establishments. The greater part of the heating apparatus referred to above are made in the capitals. The raw materials in this industry are cast iron and sheet iron. The former in its crude form is obtained from England, and until lately, by a certain manoeuvre, duty free.

Three ineffectual attempts were made to light the city of St. Petersburg with gas. The first was during the reign of Alexander I., when, just as all arrangements were complete, the buildings caught fire, and the plan was abandoned for some years. The second attempt was made after the accession of Nicholas I. The high and ungainly building intended for the gasometer was injudiciously placed near the Winter Palace, and formed so prominent a deformity that the Emperor, in 1838, was glad to buy up the whole of the premises belonging to the company, for the purpose of having them pulled down. The company then went to work again, and in the autumn of 1839, when people were beginning to look forward to a light winter, the whole illumination was opened and closed on the same day by a frightful explosion, by which the gasometer was destroyed, a number of people were killed, and the money of the shareholders was lost. At last a manager, Mr. Ayliffe, was sent from England, who in a short time brought everything into proper order, and the company again started, and has been prosperous, we are told, ever since.

There are now three gas companies at St. Petersburg, with a constantly-increasing business. At the time of the Crimean War, and for some time afterward, St. Petersburg was very imperfectly lighted. In many of the streets there were only oil-lamps, and in many more no lamps at all. At present, taking it all in all, the gas-lighting of the capital is thorough and brilliant. Whether it is the result of atmospheric influence or not, but it is noticeable the gas in the streets seems to burn brighter than in London, yet it is made exclusively of British coal. The lamp-posts, which are of a more ornamental and solid kind, are placed closer together than in the London streets. It should be remarked that up till now there still exists a prejudice

against using gas in rooms of private dwellings. It is confined chiefly to the yard, entrance-hall, and corridors. As to its adoption in churches, such an act would be deemed by the orthodox the height of sacrilege. Shops, hotels, public buildings, &c., of course avail themselves of this mode of lighting; but the gasfittings are frequently of the most unsightly and common kind.

The lighting with naphtha and kerosene oil has had a considerable share of attention. It is well known that Russia possesses in the Caucasus an inexhaustible supply of mineral oil, especially at a place called Baku, on the Caspian, where the naphtha bursts forth in copious springs. Several towns of the interior, especially those situated on the Volga, are lighted with naphtha-gas, among which is the large town of Kazan. It is used also at the St. Petersburg Imperial Mint, where the entire apparatus for producing it, together with 367 burners, cost 1,500l. Many factories and works situated at great distances from large towns have also adopted this mode of lighting, which is considered exceedingly economical. Some experiments have been recently made at St. Petersburg of a novel apparatus of very simple construction, for making gas from crude naphtha. The light of one burner was equal to the light of seven candles, and the product of 1 pood (36 lb.) of naphtha burned 700 hours, the cost per hour being 0·17 of a copec. Out of 1 pood of naphtha were obtained 350 cubic feet of gas; the lighting power of one cubic foot being equal to fourteen normal candles. Out of these 36 lb. of naphtha a light was derived equal to 4,900 candles; one burner equal to seven candles consuming half a cubic foot of gas per hour. Coal-gas, however, we believe, is still destined to hold its own in Russia, especially when the produce of her extensive coal fields can be carried profitably into the interior of the country. In the coal-producing provinces of the south, such as the Government of Yekaterinoslaf and the country of the Don Cossacks, and the neighbouring provinces where Russian coal finds its way, there is a demand for gas-making apparatus for private use and for factories, &c. In the forest governments there is a request for apparatus for making gas out of wood, and especially of forest-rubbish, such as broken branches, roots, fir-cones, &c., and, in the North, of peat; apparatus for making gas from oil is also in demand here and there. The cost of manufacturing coal-gas from British coal at St. Petersburg is as follows. We will take works producing 12,000 cubic feet per twenty-four hours, and supplying 500 burners: coal at 12 copecs per pood (22s. 6d. per ton), 1 rouble 17 copecs (3s. 6d.) per 1,000 ft.; at 30 copecs per pood (60s. per ton), 18 roubles 60 copecs (8s. 6d.) per 1,000 ft. The introduction of gas into Russia being of recent date, the gas-apparatus industry in that country is yet new; they are supplied to a great extent by England, Germany, and Belgium. As to the general arrangements of gasworks in Russia, they are much the same as in this country; there is this difference, however, with the gas-holders, they are contained in a separate enormous brick building with sheet-iron roof, in order to protect them from the snow and severe frosts of the winter. This plan necessitates a number of smaller gasholders than would be required if they could be placed in the open, and all this naturally adds considerably to the cost of construction. Owing to the initiative of the town councils and the new institution,—the *zemstvos*, or provincial assemblies,—the introduction of gasworks has been extended to several of the sea-ports and some of the provincial towns.

The Moscow Gasworks Co. is an English company, now noted for the conscientious manner in which it executes its contracts, both with the town council and private consumers of gas. Our countryman, Mr. Bowyer, has a wide reputation in Russia for the manufacture of gas apparatus of every kind. It is a fact that we seldom if ever hear of an original invention of any moment coming from Russia. That the

\* The early history of this company, if we understand rightly, is not a creditable one. Coals, it was stated, were bought in large quantities when not wanted, merely that agents might get their commission, and the whole affair was so managed that the original shareholders, at least those of them that we know, never received a shilling or a word of explanation. A correct account of the company would be valuable, and might lead some English investors to pause before sending their money into foreign parts. Mr. Leslie, our late consul in Moscow, was at one time manager of the works.



capacity of inventiveness is little developed among the Russians cannot be doubted when we consider that during two decades the number of patents granted to *bond fide* Russians amounted only to 200. But, however few may be the original contributions of Russians to science and art, they are quick to appropriate and profit by the discoveries of the West. Yet it must be admitted that latterly a greater self-reliance and originality is noticeable, especially in the province of electric lighting. The Jablochkoffs and Raypoffes have gained no mean reputation as pioneers of the new system,—shall we say, the light of the future? We may here notice also Colonel Shpakoffsky's invention of a valuable and practical application of lighted naphtha dust produced by a powerful blast, and used for rapidly heating boilers, &c., which has been successfully applied by him to a steam fire-engine and a steam launch of iron construction. In the form of a spray-it produces a most powerful light. It is worthy of notice that already in the Caspian and on the Volga some of the steam companies use no other combustible than naphtha refuse. It supplies fuel also for stationary steam-engines. Paraffin, or, as they call it in Russia, kerosine, has been also applied for household cooking purposes. A Moscow manufacturer advertises two apparatus for cooking dinners, boiling coffee, &c. No. 1 (single), at 6 roubles, 18s.; No. 2 (double), at 8 roubles 50 copeks, 11. 5s. 6d.; the consumption of fuel is estimated at less than one copek per burner per hour. Stoves are also made for heating purposes on the same principle, but on an extremely modest scale. Cooking by means of gas has never been popular in Russia, owing partly to the comparatively high price of gas, but principally to the belief that the latter imparts a disagreeable flavour to the viands. It is not at all improbable, however, that were the Russian public acquainted with some of our improved gas ranges the prejudice would be gradually overcome.

There is another Russian invention deserving of notice,—the so-called "Neptune's Lantern,"—devised by Colonel Von der Weide, and used in connexion with all kinds of subaqueous operations. The principle consists in introducing a light below water, which is made to burn in artificial air,—of oxygen and hydrogen gas. The apparatus is considered to be a rare combination of cheapness and durability, is practical, and will throw a ray of light to a distance of 40 metres. It consists of the following parts:—an iron cylinder forming the lantern, with convex glass lamp and powerful reflector. This is connected by means of gutta-percha tubes, with two copper cylinders; one charged with oxygen gas, the other with hydrogen, which are conveyed into the lantern under water; weights and counter weights for holding the lantern in a vertical position.

One of the most useful innovations that have been introduced into the interior organisation of the capital is the establishment of water companies. Until a few years ago in none of the houses was the Neva water laid on by means of pipes; but in each house there was a large water-but, and the men, whose exclusive business was to fill these reservoirs, were busily engaged all day long with their water-carts, drawn generally by one horse. From the reservoir the water had to be carried by the *dvorniks* or yard-men to the various lodgings right to the top sometimes of a five-storied house. It is needless to point out how precarious was this mode of supplying water, and that the cost was very considerable. The poorer classes in some parts of the town are even now compelled to fetch their water from the river or canal-slides in pails slung on a yoke. In the winter holes are cut in the ice for that purpose. This mode of water supply still prevails in all the small towns of the interior.

Since the establishment of waterworks there is naturally a demand for cast and wrought iron pipes, in which latter article we hear the Germans and Americans are able to compete with this country. The plumbers' trade has received a marked extension, and lead pipes for the water supply within the houses are in great request; the duty is only a nominal one (5d. per cwt.). Some of the St. Petersburg plumbers are introducing lead pipes covered inside with a layer of tin as a sanitary precaution. It is found that the soft Neva water, with the action of the atmospheric air, tends to oxidise the common lead pipes, which is so injurious to health. With the new system of water supply, water-closets and baths have been introduced, but only

in the houses of the very wealthy, in first-class hotels, &c.

The importance of pure, filtered water is fully recognised, and water filters of various systems, both ancient and modern, are used in almost every household. But in the spring these purifiers are absolutely indispensable; for at that time of the year, when the snow melts, the river for a time loses its accustomed purity, and the want of clean water becomes a subject of general lamentation.

We should here notice a filter of German manufacture in the shape of an inverted cone, which is coming rapidly into vogue since the water has been laid on by means of pipes. It is attached to the water-pipe above the kitchen-tap, and is deemed very practical, and will supply a large quantity of filtered water for domestic use. It has been adopted in hospitals, barracks, hotels, and factories. The apparatus being rather expensive, arrangements are per annum. The filtering material is some sort of an artificial composition, more efficient, it is to be hoped, than some of the compositions used in England.

The large number of fire-engines shown at recent exhibitions held in Russia demonstrates the great extension of that branch of machinery construction due to a certain extent to the increased demand for pumps required for the water supply of railway stations of the numerous new lines in the course of construction, and partly to the extraordinary measures taken by the provincial assemblies and the Government for the protection of buildings in case of fire. Besides, the productions of pumps and small fire-engines can be effected in workshops of limited extent, which do not require expensive mechanisms, and in which the work can be executed by hand with the assistance of a foot-lathe.

Hand-pumps of various systems are being rapidly introduced in the small towns. They are manufactured in the capitals and larger towns of the interior, St. Petersburg, Moscow, and Warsaw being specially noted for their production, among which are also garden-engines, hydro-pulps, &c.; they are of the usual types seen in this country and on the Continent. Among the pumps imported from this country may be mentioned the California, Hollman's steam cannon pump and portable steam pump, Tyler & Son's deep-well pump, with horse-gear, and Thompson's centrifugal pump. The American Bridgewater Co.'s pumps are also used. Most of the large factories and works in Russia have adopted precautions against fire by having a reservoir of water at the top of the building connected with a system of pipes with hydrants and hose. Water-carts on the English model have superseded the old-fashioned casks on wheels.

The questions of heating, lighting, and water supply are burning questions in Russia, and are claiming the serious attention of the Government, the municipalities, and learned societies; to this may be added the question of drainage, which practically does not yet exist in either of the capitals or any of the other towns of Russia, large or small. In conclusion, we cannot but remark that our manufacturers appear to neglect certain opportunities of acquainting the Russian public, the inhabitants of the capitals and large towns, with their productions and the improvements made in them from time to time. In this respect the Germans are far in advance of us. They avail themselves largely of the Russian press for advertising their wares, and wherever there is an exhibition their articles are sure to be there; especially has this been the case with apparatus connected with heating, lighting, and water supply. At the late Moscow Polytechnic exhibition, England was not only not represented in these departments but scarcely represented at all. Yet British goods, especially of metal, have still a reputation in Russia far beyond those of any other country. Besides there is a growing desire among the consumers in Russia to enter into direct business relations with the producers of this country. There are now facilities for this, which did not formerly offer themselves,—a widely extended net-work of railways,—the institution of numerous local banks for foreign trade, and an increased and more varied demand for all kinds of goods; towns are increasing rapidly in area, and villages are becoming acquainted with the necessities of civilised life. Like business men of any other country, the Russian dealers see the advantage

of going to the cheapest market, especially since the existence of the low rate of exchange, and the compulsory payment of the duties in gold, which makes a difference of fully 50 per cent. on the former payments in paper money.

## ILLUSTRATED EXHIBITION CATALOGUES.

UNDER this general heading we may group three small volumes that are before us,—the "Illustrated Catalogue of the *Salon* of 1882," published under the editorship of M. Dumas,\* and "Academy Notes" and "Grosvener Notes" for 1882, brought out by Mr. Blackburn,† who has now acquired a reputation in connexion with this method of retaining a record of annual picture exhibitions, which he was the first to introduce.

The French and the English productions in question differ in one essential point. The catalogue of M. Dumas offers no comment upon the works exhibited, one way or another. It supplies the purchaser with key-plans of the *Salon* galleries, with a catalogue of all the artists exhibiting, and the names of their works, and with about 400 facsimiles of artists' sketches of their works, including those which were most important or seemed best adapted for reproduction in this way; probably the selection has partly been decided by the readiness of some artists to furnish sketches, as compared with others of their brethren. It gives the titles of the works in French, with an English translation, occasionally of a very wonderful kind; for instance, a statue of "Le Physique," intended for the observatory at Nice, is administered to the English reader as "Physic!" But beyond this the French editor does not go; and though we would suggest that on another occasion he should get an Englishman to overlook his translations, these errors are harmless and only amusing; and we at least commend his reticence in refraining from imposing any expressed opinion upon any of the works on his purchasers. In this respect we strongly recommend Mr. Blackburn to follow his example in future "Notes." No one who is capable of thinking for himself about pictures likes to have even the most intellectual criticism obtruded on him in a catalogue, which he buys merely for reference and record. Mr. Blackburn's critical recommendations, when he does introduce them, are not remarkable for depth, and to the best class of visitors (intellectually) appear simply impertinent, while affording no reliable guide to the more ignorant. To us it has been a source of considerable annoyance to see foolish people, who have no understanding of pictures, going about the rooms with these books in their hands, and repeating, like parrots, remarks from their printed guide, which in one sense certainly are about suited to their intellects. We advise the editor in future to content himself with the French system of simply cataloguing and giving illustrations (which was adopted this year by the Royal Society of Water-colour Painters in a charming catalogue which they issued).

The question of the artistic value of the illustrations is another matter. On the whole, there is a marked improvement in the illustrations to Mr. Blackburn's catalogues, and from the large preponderance of sketches marked with an asterisk, he seems to have succeeded in inducing a much greater number of artists to contribute sketches of their own works than formerly. His illustrations are all in the same method of execution and in the same tone (black); in the *Salon* book there are great variations in this respect, some of the illustrations being in warm red and brown tints, apparently according to the taste of the artist; some are rather finely finished, some are mere rough scratches. This idiosyncrasy gives a greater interest to the *Salon* book; but the more equable manner in which the illustrations in Mr. Blackburn's notes are produced has its advantages, as enabling one work the better to be compared with another in this memorandum form, and giving the whole book a somewhat neater and more carefully prepared appearance. Regarding the illustrations in each publication as *fac-similes*, it would seem that the French artists who contribute aim more at effect, and at conveying the feeling of their work, the English more at accuracy of line. On the

\* London: Hamilton, Adams, & Co.

† London: Chatto & Windus.



whole, we should say that the figure illustrations in Mr. Blackburn's books are more carefully and cleverly drawn, and have more the appearance of accuracy, than those in the *Salon* catalogue, though they make a far less effective "picture-book," when we come to look at it in that way. The landscapes, on the other hand, are far more effective in the *Salon* book, partly on account of the employment of delicate brown tones, in which some effect of aerial perspective can be conveyed, which is hardly possible in slight sketches in black.

The difference between the general character of subjects, in turning over the Academy and the *Salon* book, is remarkable. There are some decidedly vulgar things among the *Salon* memoranda, and one or two that are worse than vulgar. But one cannot help being struck by the large proportion of subjects of an ideal and poetic class, — works which really suggest something to the mind, as compared with the exceedingly prosaic nature of most of the Academy subjects. Such a fine delicate little fancy as that embodied, for instance, in M. Burger's picture called "The Duet," where a child in some freak of fancy is playing on a pipe in front of a classic statue employed in the same way, seems out of the scope of English art. It is a trifle, but it is a trifle which sets the fancy going, and suggests a number of pleasant wanderings to the mind; and the same may be said of other ideas embodied in the *Salon* collection. French art includes so much that is spiritual; in England, we have not the phrase, and have very little of the quality, and what we have is mostly owed to suggestions from French art.

#### OUR SCANDINAVIAN ART-ANCESTORS.

The interesting paper read by Mr. Harris Stone at a recent meeting of the British Association, — and printed in these columns, — describing the Viking ship lately discovered in Norway, eminently served to draw attention to a period of history and a civilisation which, closely connected as it is with the civilisation and history of our own country has too long been left even by archaeologists, in undisturbed oblivion. And now comes an exhibition at the South Kensington Museum of ancient relics gathered from the countries grouped in modern times as Scandinavia, which can scarcely fail to bring it prominently before the public mind. The great Scandinavian nation after a glorious and conquering era of existence has sunk into comparative insignificance, driven back to the bleak regions from which its heroes centuries ago sallied forth, sailing South, and East, and West, across even, — so tradition states, — the Atlantic to the still "undiscovered" America. With a past as glowing in great deeds, it is little wonder that archaeology is a popular branch of study in the North, keeping alive, as it does, the memory of the great days when the Scandinavian nations were united in their conquests and their power, when their civilisation made them the brilliant superiors of countries which then were plunged in barbarism, though now their masters and oppressors. The field is a rich one for the archaeological student, and has already in Denmark, Norway, and Sweden yielded an ample harvest of information. The literary remains of the *Sagas* and *Eddas* have long been known, but a new light was thrown on the subject by the study of the widely-scattered Runic inscriptions, the old laws, the store of folk-lore in which the Scandinavian nations are peculiarly rich. Still more recently a further advance has been made in the attention paid to the long-neglected architectural and other remains scattered over the Scandinavian peninsula, Denmark, and their dependencies. The story of a past civilisation, all trace of which was considered as lost, has been found; it is to Scandinavia that we owe the most recently introduced branch of antiquarian study known as prehistoric archaeology, and which has opened up such a wealth of unsuspected information. The period of their history which has most interested the northern archaeologists, and on which less doubtful sources exist than the earlier epochs, is that in which the power of the Scandinavians was greatest, when their vessels bore their conquering Vikings not alone to our shores but to those of France, the whole Baltic, Greenland, Iceland, and the still less congenial Mediterranean.

Some months since our learned contemporary,

the *Revue des Deux Mondes*, published a long and able article from the pen of M. Alfred Maury, on the subject of the civilisation of Scandinavia. In view of the present Exhibition we are disposed to think that a summary of this article will be acceptable, relating, as the subject does, to the civilisation of a people on whom we may justly look as in a large measure "flesh of our flesh and bone of our bone."

From the Romans we gather but scant information respecting the Scandinavians. The Romans had been unable to conquer either the inland Vindes or the maritime Saxons, whose supremacy on the sea presaged the fame that their descendants have to this day retained. United with their neighbours of Jutland, Schleswig, and Frisia, the Angles, the Jutes, and Frisians, themselves hardy sailors, their armed fleets penetrated every corner, every estuary of maritime north-western Europe. When this race of bold corsairs had finally settled down, some in the interior of Germany, others on our fertile shores, they were replaced on the sea by a fresh race of depredators from Scandinavia, and known to the unfortunates on whom they constantly made their descents as Normans, or men of the North. More adventurous than even the Saxons, they advanced further afield. The Low Countries, France, and Great Britain, from the eighth to the tenth century, were frequently a prey to their rapacity. The declining power of the Romans in Albion and the Gaul was unable to resist the invaders, whose descents became yearly more frequent and ruinous. The churches and monasteries even were not spared. French ecclesiastical annals are full of lamentations as to the Norman pirates, whose vessels bore their crews far up the great rivers into the very heart of the country.\* Paris itself, in the ninth century, was besieged by these Northern conquerors, and on one occasion capitulated to their chief; and it is an historical fact familiar to readers, how eventually the Normans settled down in France, and founded the province that to this day bears the name of Normandy. It is a feature worthy of notice that these settlers, the pirates of old, soon took a foremost place among their neighbours.

No feeble followers of the debased Roman traditions, their genius struck out for them a new path, and as Englishmen we feel no shame in owning as our ancestors the warlike yet civilised Normans, whose renowned leader was in later years to place the crown of England on his head. An origin for this superiority of the Normans must be traced in their Scandinavian origin, as it is in that of the Danes, who invaded our coasts, where they eventually settled down. The imprecations heaped on their heads, the reputation they bore for their ferocious and barbarous piracy, we feel were exaggerated, and it is interesting to trace from the studies of modern archaeologists the proofs of their civilisation, and its origin, of the hordes the appearance of whose fleet was the signal, if we are to believe the chronicles, of a terrified flight from the coasts inland. The proofs which research has furnished the modern Scandinavians in their patriotic task, are ample to show us that in the ninth and tenth centuries the population of Denmark, of Sweden, and of Norway lived on in the enjoyment of a social system which in industrious activity and refinement may be fairly said to bear comparison with that of the Christian nations of the West. As long ago as 1852 M. Worsaae published a learned work on the Danish and Norwegian rule in the British Isles, and in which he most satisfactorily showed the share due to this Scandinavian conquest, in the civilisation of our Anglo-Saxon ancestors. By means of his research we see the Danes, who ruled us under Sweegen and Canute, or Cnut, in a position of importance that no English historian had shown; and the picture of the Danish power in the eleventh century was a preparatory step to the same author's subsequent rehabilitation of the dreaded Vikings, the *Sœrauber*, as the Germans call them, and the study of whose civilisation, overwhelmed and maligned by the establishment of Christianity, has been followed in their own home. Long before the Germans had learned to cultivate their poetry, the Scandinavians possessed a literature of their own, a mythology in which modern erudition has clearly traced another bond of union existing between the

racés of Europe and those of Persia and England.\*

The Scandinavians, inhabitants of a bleak country, and living under a churlish climate, were by nature forced to seek abroad their very necessities, and from the earliest times a hardy, warlike, and maritime race was developed. All the great races of antiquity were warriors, and their civilisation has invariably followed their progress in the art of war. The Vikings as warriors and pagans, were looked on by their Christian enemies solely as pirates, and, no stranger having ever visited their country, their barbarism was a settled point in the minds of their enemies. This was, we now learn, but comparative. By their vessels we see they had arrived at a high degree of civilisation; each vessel, so far from being manned by a crew of pirates, was a portion of a well-armed fleet, commanded often by a prince; these true "ships of the line" bore various names, some, from their length, termed *Drageske*, dragons; winged serpents, *Lindarne*; serpents, *Snækar*; in addition to the traces existing of such vessels in Scandinavia, we know that the Normans descended on our coasts in regular "liners." We have seen, from the recent paper of Mr. Harris Stone, describing the discovered remains of an antique Scandinavian vessel, that the art of wood-carving figure-heads, &c., and probably of painted decoration, was known to the "Vikings." The chronicles speak of the Normans' vessels as adorned with brilliant figures, often gilt; the sails of the leader's vessel of silk. This degree of luxury and skill in naval architecture is not the sole proof of the civilisation of the "Vikings" in the ninth and tenth centuries; the costume worn by their chiefs, and relics of which have been discovered in their unearthed tombs, point to a further degree of civilisation. A *tumulus* existing in Jutland, dating from the end of the Pagan period, is described by M. Worsaae as containing, among other objects, a woollen mantle with a fur-edge, the stuff woven with a pattern of death's heads; with the mantle was found a belt of gold-woven silk, as were also two bracelets, likewise of silk and gold. That these objects were of Scandinavian origin, — the silk and gold alone excepted, — there remains no doubt.

The commercial relations of the Scandinavian were considerable, and their wealth must not solely be set down to their piracy. With the East they held constant communication, the presence of Oriental coins in Norway, and discovered in the Baltic Islands, as also the Oriental character of the pieces of jewelry found with the dead are conclusive proofs of this fact. It was from the East that the Scandinavian obtained the silver which the native jewellers worked up, and which appears to have been more used than even gold. The discovery of Byzantine coins in the Scandinavian peninsula, proves that commercial relations existed between the North and the Eastern Empire as early as the fifth and sixth centuries of our era, and that these relations were particularly active in the tenth and following century. It was from the East that came the gold-embroidered silks that the chiefs used as their mantles. In the discovery also of a large number of Anglo-Saxon coins of the time of the Heptarchy show an active traffic between our country and Scandinavia. We have proofs here that it was not invariably as pirates that the "Vikings" sailed to our coasts. At the close of the ninth century Eric, son of the King of Norway, had received the surname of *Mercant*, from the fact of his vessels trading with foreign countries.

The Scandinavians exchanged the few products of their soil, and their fisheries, for the objects of which they were in need; but, as we find so often in ancient times, commerce and piracy went hand in hand. Canute the Great concluded with different nations treaties of commerce. To every point of the still-undiscovered compass, these hardy sailors pushed, the Baltic was familiar to them, — Wulfstan, in the time of Alfred the Great, visited the Gulf of Finland, — and far west the Farøe Isles, the Shetlands, the Orkneys, the Hebrides, and Iceland were explored by the Scandinavians; Greenland in the tenth century was colonised by the Norwegians, as numerous Runic inscriptions and remains of dwellings attest. That the Scandinavians reached America is a tradition which no proof to the contrary has yet come to

\* Depping's "Histoire des Expéditions Maritimes des Normands" will be found to supply many details of these incursions.

\* See an admirable work by Dr. Wagnar, translated into English and edited by Mr. Anson, "Asgard and the Gods," etc. 1880. 8vo.



overthrow, and is more than probably founded on fact.

With a commerce and warlike exploration thus extended, a marked progress in the civilisation of the Scandinavians might justly be expected, and such as throughout ancient history we find to be the case. Excavation has brought to light a large number of objects belonging to the ninth and tenth centuries, jewels, ornaments, clothing, arms, and utensils, the proofs of a state of elegance and refinement of, however, marked a Scandinavian character, not purely of Scandinavian origin; Byzantine and Latin influences are traceable. At the epoch which the northern archaeologists have termed the Iron Age, commerce had already brought to the shores of the Baltic objects of western and southern origin, which served as models to the native workmen, a fact ably shown in a paper read some six years since by M. Engelhardt on the "Influence of Classic Industry and Civilisation on those of the North." The earliest productions of this Northern art are, as might be expected, crude and coarse. But of however strictly foreign origin the art of the "Vikings" may be, it none the less is thoroughly Scandinavian; there exist, indeed, few arts of a purely original character; the art of each country can be traced to some foreign source, but in each case, after a due lapse of time, and subject to local influences, a character special to each is developed. This is the case with the Scandinavian nations, whose ornamental surroundings were not alone those acquired by purchase or force from other lands, but in many instances of strictly native origin. Those not rich enough to wear jewels and gold, contented themselves with bronze, often gilt, and the fibulas found are of extreme elegance; in many cases we meet with a favourite form of Scandinavian ornament,—the serpent or dragon,—these being of a date previous to those works in which the decoration is more complicated, and in which, for instance, will be found worked out à jour figures of men and of animals. Such fibulas were worn by the chiefs; others, again, were worn by the women, these bearing a distinctive character, decorated often with figures of doves or ravens. During all the period which the northern archaeologists have termed the "Middle Age of Iron,"—extending between the years 500 to 700 of our era,—we find the Scandinavians displaying in their decoration an extreme degree of wealth. In the tombs unearthed, in addition to numerous necklaces, bracelets, earrings, and medals, have been found glass beads of varied colours, mosaics, rock crystal, amber, and even bronze, for in these early ages the male sex will be seen to largely share their helpmeet's love of ornament. The Scandinavians of the Viking period wore, like the Gauls, gold rings and bracelets, and the Copenhagen Museum contains many treasures of the jeweller's, and the gold and silver smith's art of this early epoch. That in such a society the arms and armour of a warlike race should likewise have received the attention of the decorator is only natural; silver damascened hatchets, inlaid in some extant specimens with rubies and gold, heightened with *niello* work, though rare, exist. Little wonder that such treasures became in the families of their owners heirlooms, and the workmen who had forged and adorned them famous and honoured. The bucklers were of wood, covered with leather painted, even gilt; their armour resembled that in use contemporaneously in the West,—helmets and coats of mail have been discovered. Thus on land, as at sea, these hardy warriors were redoubtable enemies.

The use of cavalry was not unknown to them, their horses being shipped from home; and the decorative character of the harness in use furnishes a further proof of the refinement of these "sea-robbers"; to the custom of the burial with each chief of his war-horse to bear him to the brilliant *Walkalla*, we owe the preservation, in many cases, of specimens of the harness used by the Scandinavian chiefs; it is often garnished with gilt bronze, often gold, often silver. In Southern Norway was unearthed some years back a spur of solid gold, weighing no less than 11 ounces, and decorated with purely Scandinavian motives; and the same refinement was carried through all the trappings both of horse and chariot. As a curious proof of the native origin of this decorative art, in a tumult near Yiborg was recently discovered by the side of a number of such

trappings in *repoussé* work the very tool used by the workman for his purpose, and elsewhere various other ornamental motives were discovered in the workshop of a contemporary blacksmith.

The art of the locksmith had acquired a like degree of refinement; keys of the most delicate workmanship have been brought to light; a relative degree of perfection in such a branch naturally implies a like refinement in most of the surroundings of our Scandinavian ancestors, in their furniture and in the construction of their houses, at that time built entirely of wood; contemporary literary authorities speak of great halls decorated with skillfully carved images, mostly of a religious character. The utensils discovered in the course of the excavations have all denoted a high degree of civilisation; goblets, cups, and many objects such as in the present day would come under the head of plate, all of extreme beauty of design and execution, still exist to show us the domestic refinement of these "pirates" at home. In their burial this same refinement was largely carried out, and the tumuli have supplied the archaeologists with a rich store of suggestive objects of study and admiration. The monuments which were placed over these graves when containing some chief, while showing no highly-developed architecture, prove the Scandinavians not to have been much inferior to the Romans of the decadence; these monuments usually consist in an upright stone bearing Runic inscriptions, a field of study much followed in the North, and which has already yielded many most interesting results.\*

With the introduction of Christianity, the characteristic art of Scandinavia was to receive a fresh influence, while, at the same time, the native element still strongly shows its existence, and long after the old religion was dead the remains of its art are traceable; the wealth of curved lines interwoven, the introduction for decorative purposes of human figures, quadrupeds, flowers, and serpents, continued all through the Christian middle ages, and as M. Vedel, an eminent Northern antiquary has shown, can still be traced to this day in the carved work produced in many of the remote valleys of Sweden and Norway. How deeply enrooted in these countries of the North are the old myths and traditions, is amply shown by their literature and their rich folk-lore, which have furnished so many materials to the modern poets of Germany, England, and America.

If we are to believe M. Warsaë, his researches on the Danish occupation of Britain show us the Danes, so far from spreading far and wide through our island their barbarism, largely serving to develop our civilisation. They were, indeed no barbarians whose aid Alfred sought, and alliance with whose princes was made by our reigning kings. Canute we see reigning at the same moment over his Scandinavian possessions and his Anglo-Saxon kingdom, in the history of which he has left a revered name for his wisdom and justice. Later on, the bonds with the nation across the German Ocean were broken, but we preserved our Danish population, which, while it mingled with its Anglo-Saxon brethren, still bore its own marked peculiarities, and these we trace throughout all the early history of our island. M. Warsaë has endeavoured in his history above mentioned to trace the presence of the Scandinavian in the British isles, in the north and east of England the Danes,† in Scotland the Norwegians, and again in Ireland; everywhere we meet with the ruling trait of the Scandinavian character, the genius of domination, still strongly developed in our British nature, for the Normans who conquered England were themselves of Scandinavian origin.

The spirit of domination and the genius of colonisation which stamped this sturdy Scandinavian race long existed after they had lost, either through conversion to Christianity or contact with other nations, the original and vigorous character of their old organisation. Little by little the peoples over whom they had long ruled drove back to their home the race of the "sea kings"; if still in many countries

visited by the Vikings we can trace their presence in the names of towns, in local idioms or in local customs, all trace of their political influence has long since disappeared with the development of the civilisation they once enjoyed, and the power they wielded, just as we see in the case of so many of the great nations of antiquity. Thus it was with the Egyptians, the Greek rule but enfeebled their tottering power ruined for ever by the Arab conquest. In our own time we see the Turks, whose power once made all northern Europe tremble, which overcame many a brave Christian army, lose, one by one, their European provinces, driven slowly back to the home whence they came; but long after the Turks have been forced back across the Hellespont, there will exist traces in Europe of their presence to tell the tale of their once brilliant power and prosperity. What will happen for the Turk has happened with the Vikings of old. When Christianity spread to the Scandinavian peninsula, the civilisation of the sea kings was overcome and buried with its representatives, and now the archaeologists exhume its remains to point out to the present generation the traces in their midst of a once ruling power, and a society, the character of whose existence and refinement has been too long overlooked.

#### FROM THE BANKS OF THE SEINE.

WITHIN the last twelve months there have been considerable changes in the old Faubourg St. Germain; the Boulevard is now almost completed; several of the conspicuous corner houses at the western end, then in the hands of the workmen, are now occupied, and form very important features. In the aristocratic Rue St. Dominique, one of the old *hôtels* is being rebuilt, and is just now enveloped in clouds of dust and a forest of scaffold-poles, while within the year the historic Hôtel de Mailly, which stretched back from the Rue de l'Université to the Boulevard St. Germain, has disappeared, and on its site an entire street, the Rue de Mailly, has been built. The houses which form this new thoroughfare are models of the most approved modern style of Parisian *maison de rapport*. The exterior decoration is reduced to a simplicity in which all trace of the florid and vulgar ornamentation in vogue during the late Empire has entirely disappeared, to give place to the classic refinement of the "Style Louis Seize," as near as possible the French Adams style; while the distribution of the interior plan is the result of the most ingenious consideration. In every house there is the traditional *porte-cochère*, with the well-decorated passage-way into the little courtyard at the back; in each house the equally traditional *loge of the concierge*, on the ground-floor. In the small courtyard, at each side, are arranged a coach-house and a two-stalled stable, with loose box, affording two lodgers accommodation, on a small yet ample scale, for horses and carriage. The owner thus has the certainty of feeling (a feature left in considerable doubt with our system of separated coach-house and stables), not only that "the man" cannot possibly use the carriage without its being known, as he has to rumble through the *porte-cochère*, but he is at hand at any moment, the horses can be seen, and the absolute cleanliness of the stable ensured. As for the arrangements of the upper floors, they are only improved modifications of the existing type, such as every one who knows a French house must have had reason to admire; the feature of the pleasant ground-floor with a corner room lighted by three windows is, however, an agreeable novelty; in addition the luxury of balconies is afforded to each floor.

In another aristocratic neighbourhood, the Faubourg St. Honoré, a like speculation has covered the site of the once familiar *hôtel* of the Duc d'Angoulême,—whose two superb bronze green gates and jealous enclosure wall always reminded us a little of Devonshire House,—with a new street and a batch of new houses, like those in the Rue de Mailly, they are of the most approved modern type, one which we would wish might receive more study from our strictly professional builders than is the case at present; for let it be understood that such houses in Paris are not invariably the design of the architect proper, but of a specially educated section of the profession, whose chief study is devoted to the necessities of town architecture, the practical consideration of the treatment of small

\* Casts from two of these Runic crosses existing in the Isle of Man will be found at the South Kensington Museum, which has presented duplicate copies to the Ecole des Beaux Arts in Paris.

† The name of *Sutherland*, preserved by one of the most northern of the Scotch shires, is of purely Norwegian origin; to the invaders it was a *land of the south*. M. Warsaë points to a large number of geographical names bearing a Norwegian origin. In the Isle of Man further traces exist. Dublin, Waterford, and Limerick were, in the ninth century, capitals of small Norwegian states.



spaces of highly-rented land, the application to the modern exigencies of existence in the present day, of all the recent improvements, and the desire on the part of the landlord to give to his tenants,—what, it is true, they demand,—the utmost room, thoughtfulness of plan and comfort that can be supplied for the outlay. On these points it is our belief that we may have much to learn from the study of what our foreign brethren are doing in Paris, and not only in Paris, but in all the great capitals of the Continent. In this direction the arrangements of those who, knowing this, have enabled our young architects to travel abroad with a view to sending home not so much their opinions of the great creations of the past, as has till now been the tradition with travelling students, as reports on the works of the present, will, it is to be hoped, meet with further encouragement and extension.

Against the ample accommodation which is being afforded for the well-to-do in Paris, there must always be set off the daily increasing difficulty found by the working classes in obtaining cheap and suitable quarters. It is a grave, and, if considered, far from satisfactorily solved question which presents itself both in London and Paris. Each day, as the old neighbourhoods are demolished, the artisans who found there the rents that suited their narrow means are driven further away from the centres of employment, near which they naturally desire to remain, and practically scarcely any accommodation is being afforded for their wants. The landlords cannot, of course, be expected to prefer, to large rents and good tenants, comparatively small and irregular returns, and legislation is not sufficiently active. On this point London is certainly far ahead of Paris; and, apart from the cheap means of transit to the suburbs now afforded, the numerous blocks of industrial dwellings which have replaced in London some of the once most wretched dens of our metropolis, show at least that we have grappled to some small extent with one of the chief difficulties which arise from the peculiar conditions of modern urban existence.

Among the further changes which a year has worked in Paris it is not out of place to mention that the Champ de Mars, the site of the Great Exhibition of 1878, has at length been restored from its chaos of brickbats, iron girders, scrubby trees, and deserted kiosks, to something like order. The space has fortunately not been entirely given up again to the manœuvres of the École Militaire. Before long a small park, occupying about a fifth of the whole area of the once sandy plain, and to bear the name of the Champ de Mars, will be thrown open to the public. The new garden is of the type that the French excel in laying out with all their traditional skill, aided by modern science; and we may be sure that the public of the thickly-populated district which surrounds the Champ de Mars will not be slow to avail themselves of the advantages of their new pleasure-ground. The nurses and the children will take possession of the place, and the seats,—of which in Paris there are invariably plenty provided,—will be always occupied. Statues, purchased generously by the municipality from each year's *Salon*, will soon come to add to the charms of Nature, and the rising generation thus healthily formed in the midst of greenery, of birds, of trees and flowers, pure air and art.

The new room at the Cluny Museum, which the papers announced would be thrown open early in May, is, we may at once mention as the result of a special visit to the interesting old *hôtel*, not likely to be on view for a long time. A few glass cases are all that decorate the room, where were exhibited two years since the Viollet-le-Duc drawings, of which at the time we spoke in these columns. But the visit to the quaint old museum, with its priceless, if scarcely sufficiently classified treasures, always serves, to any one who has known the spot for any length of time, as a pleasant reminiscence of many a past happy and instructive hour. Time was (when we possessed no South Kensington Museum) when "the Cluny" was unique as a field of study for the artist and collector, but the superb gatherings of M. Du Sommerard, the father of the present worthy curator, none the less retain, distributed as they are through the old rooms of the historic and once wealthy monastery, all the charm and value they possessed in the years gone by. How many of our English architects, living and dead, it would be curious to know, have gleaned no small portion of their artistic education here? And still

for many a generation the collections of the Cluny Museum will continue to serve as a great encyclopædia of design.

At the Louvre, during the past year, there have been many important changes, not least interesting among which should be mentioned the special room set aside for the several new pictures belonging to the English school which the authorities have come into possession of, and about which we may at a future date have something to say.

The Museum of Decorative Arts, which has recently opened its doors, is also such an extraordinary advance on the exhibition of last year that it merits further consideration.

As a last detail it may be mentioned that one of the great features of Paris, the Avenue de l'Opéra, is no longer lighted by electricity; dingy gas in the busy thoroughfare now replaces the brilliant Jablochhoff; as a compensation, the court-yard of the Louvre and the Place du Carrousel are lighted by electricity, and the result is certainly interesting, as every one can understand who has observed the effect of the electric light on any architectural feature with which he may have been long familiar by day-light or under the ordinary conditions of artificial light. In other respects, however, the use of the electric light does not seem within the last twelve months to have met with much encouragement on the banks of the Seine.

#### SUGGESTED IMPROVEMENTS AT THE BRITISH MUSEUM.

It would be difficult to over-estimate the utility and educational import of the British Museum, with its great and ever-increasing library of printed books and MSS., and its antiquarian and other so costly treasures. The Museum, with its well-known collections, has been for so long a time familiar to the public, and to those who not only glance at its contents, but who "study" in it, that it is difficult for any to imagine any change in it, in its contents, or in its mode of life and management. It would seem to be one of the "fixed" things of huge London; but it is not so, for some and really not a few important and momentous changes are even now in course of going on, and in its mode of work, and some of them, it must be confessed, not before the time has come for such. If truth be told, there is much yet to be done, and thus in time, and by slow degrees, to make of it an ever-open volume of reference for all that multitude of curious things of which it is the repository. It would be impossible to over-estimate the importance and utility of the great institution in Great Russell-street. It stands quite alone in its special way. And even this vast metropolis, full as it is of such now wonderful things, though common at one time, would miss sadly the place wherein alone it can see the actual mind and handwork of the workmen and artists of the dead though yet living past.

But much, and very much, has yet to be done to make of it,—and we are here thinking of its "antiquity" department,—what it doubtless one day will be, a complete illustrated and open book of the antique, and illustration of the life of the dead, though not-to-be-forgotten, past of things. By referring to a plan of the building and its several divisions and rooms and galleries, it will be at a glance seen how accidental,—there is no other word,—has been the course of things; the several collections, as the Assyrian, have come into it by strange and lucky accident, and have found a place where each one of them could, and as space could be found or made for them, but without any thought of any general "chronological" or other sequence, and with not even, as in the instance of the Parthenon marbles, any thought of their being added to, or in any way being made completely illustrative; for this Greek Gallery does not, and cannot, hold consecutively the "illustrations" imperfect as they are, of the world-famous frieze by Phidias, and which in a larger and longer room, and in one built expressly for it, might be made even more imposing, and striking, and illustrative than they are. In any future additions to the Museum buildings would it not be well to bear this in mind, and, to as nearly as possible, so place this wonderful work of the great Greek sculptor as to give some idea of it as it was in Greek days?

But that to which we would now call attention is the opportunity there would seem to be

of a little more looking to method and chronological arrangement in the antiquarian, and, may we not add,—we most certainly ought to do so,—"architectural" department of the museum. After the books, now that the natural history is gone, come these antiquities; the Egyptian, in its long and imposing show of so much that is really of the greatest art, and impressive in architecture. Not a little might be said of it, for it has suffered but slightly from excessive washing, and cleaning, and repairs, and contrasts not a little favourably with much else near it. Many of the objects might well be so placed as to more nearly approximate to their original position when in actual use, and many would be made yet more striking than they are, and more suggestive of their so distant date of creation, if somewhat differently lighted, as in the instances of the two colossal heads, of Ramesses and Menephtah, which unluckily, as at present, face the dull light from the windows opposite the wall of the reading-room, and which all but touches them. None ever understood better than the sculptors of old Egypt did, the value of sunlight, and its effect in the adding to the impressiveness of the colossal forms they sculptured so finely, and with so still and solemn an expression. It would be impossible to find nobler examples of Egyptian work, and they are most surely worthy of a good place in this long gallery, and a fine light.

One single item more in the antiquity department there is, for which, if it lead to a little moving and replacing, will not be named in vain. We allude to the position in the Antiquity Galleries of the capitals of columns, come from whence they will. The capitals are all on the ground, and look as if mistaken for bases of columns. Mr. Penrose, in his careful book on the Parthenon, takes note of the fine play of light and shade on the subtle curve of the Parthenon capitals, as seen in place. This might occasionally, at least, be visible even in the Elgin Room, were but the capital on a level, or, at least, a very little above the level of the eye; but the said capital in the Museum Gallery is on the ground, as though it was the base of a column. Surely this might be readily rectified, and in pointing to it, among so much else, it may not be out of place, even in this short notice, to hint at the advisability of obtaining some architect's advice in any future re-arrangements, so as at least to avoid such simple and elementary mistakes as these.

We have here in this great establishment; but there is one other department of it, which, with the at present empty galleries, might well be looked to. We refer to the Print Room, so called, and to the way in which its contents are at present, as they have always been, hidden from public gaze. But few see the treasures of fine art, and draughtsmanship, and skilful engraving here, so carefully kept; for these museum treasures cannot be seen but by a very limited few at one time, and are at all times difficult to look at and study, some of them being large, and awkward to hold in a good light.

We do not venture to go into details, or to specify what would seem to be most instructive in the Print Room cases, now so closely shut, or what of it would be best worth public exhibition, but one special series of prints and proofs there is which we feel quite sure would be gladly welcomed by the art-loving public and by art students,—we allude to the magnificent series of prints and proofs of Turner's "Liber Studiorum." So much has been said about this famous work of the great painter that it would perhaps be difficult to add more to it, or to amend it, but, if truth must be told, the more you see of this fine series of Nature studies, by Turner, the more there is found yet to be looked at and studied, and read in them. Might we not, therefore, here urge that the whole double series of them, of prints and proofs, of which the Museum has so unique a collection, should be exhibited on the walls of a part of the long and now empty gallery, but so recently filled with the most curious of nature's workmanship? Such exhibition of Turner's readings of Nature's volume would, as we cannot but think, appropriately and significantly take a portion of this space. There is, as will be recollected, no complete and full exhibition anywhere of Turner's "Liber," the few leaves exhibited in the National Gallery being original drawings, and but a small part of the whole work.



## EDINBURGH ARCHITECTS.

MR. WILLIAM BURN: MR. DAVID BRYCE.

We mentioned briefly, in our last, Mr. M'Lachlan's "Notes on Some Old Edinburgh Architects," read at the Edinburgh Architectural Association. Some of our readers, we are disposed to think, will be glad to have the memoirs recorded in full.

William Burn was born in Edinburgh on the 20th of December, 1789. His father was Robert Burn, a successful builder and architect of his day. One of the father's productions was Nelson's Monument on the Calton Hill,—an example of his skill which, I apprehend, is not generally appreciated. Whatever was his own ability as an architect, Mr. Robert Burn showed much judgment in the professional education of his son. In the year 1808 young Burn was sent to the office, in London, of Mr. Smirke, afterwards Sir Robert, who at that time divided with Sir John Soane the supremacy of architectural position and practice in the metropolis. I need scarcely say that Sir Robert's practice was exclusively Classical,—of the type of the British Museum and Covent Garden Theatre, of which he was architect,—and in these Classical traditions young Burn was brought up. Among his office companions were C. R. Cockerell, afterwards the Professor of Architecture in the Royal Academy; and Lewis Vulliamy, a name well known to the student of Classical architectural works. After a few years' experience in Mr. Smirke's office, Burn returned to Edinburgh, and commenced business for himself. Even at the outset his career was a successful one. In the year 1816 there was an open competition among architects for the completion of the new University buildings, commenced in 1789 from the design of Robert Adam. In the course of the twenty-seven years which intervened between the commencement of the building in 1789 and 1816, Edinburgh had grown, and the requirements of the University along with it; more area was required, and more numerous and larger class-rooms, and consequently Robert Adam's original design for the whole structure was not applicable, and the University authorities for the time advertised for new plans. Many competitors responded, tempted by the bait of a first prize of 100*l.* to the successful competitor, and 80*l.* to the next. The two successful men for these prizes were Wm. H. Playfair, who carried off the first premium, and ultimately was the architect of the work, and Wm. Burn, who bore off the second premium of 80*l.* It is noticeable that this competition brought to the surface the names of the two men who, for the succeeding generation, divided between them the best architectural work in Scotland. Thereafter, for some thirty or thirty-five years, Playfair did more public and monumental work, and Burn more domestic work, than any other single architects of their day. Although Burn was not successful in his college competition, he does not seem to have been without large and important commissions even at that early stage of his career. I find that in the year 1816, the very year of the competition, he was the architect of the Custom House at Greenock, and of St. John's Episcopal Church at the west end of Prince's-street, Edinburgh, showing clearly that even at that early period he was a well-known and successful man. From this time till his death in 1870, for the long space of between fifty and sixty years, the professional life of Burn is a tale of uninterrupted and ever-increasing success. I shall touch upon only a few salient and outstanding points of this long and prosperous life. I have before me a list of 200 out of 700 important works executed by Mr. Burn, and nothing could more clearly give an idea of the extent and importance of his practice. The list of his clients reads more like a roll of the peerage than anything else. Running the eye down the list I find the names of the Dukes of Norfolk, Buccleuch (one of his best friends), Cleveland, Montrose, Hamilton, Rutland, Manchester, Newcastle, Marquis of Westminster, Earls of Derby, Scarborough, Kinnoull, Haddington, Wemyss, Lauderdale, Stair, Galloway, and so on and on. From this perusal of names one cannot help thinking that in the number and influence of his clients Mr. Burn must have occupied an entirely unique position among his contemporaries.

While working towards the large place which he ultimately filled in the architectural world, a few incidents as to Burn, gathered from contemporary literature, and from the lips of those

who knew him, may not be uninteresting. And first, as to his appearance, which, when attainable, it is always well to know, we have a description by his old friend Prof. Donaldson. "He had a slight figure with a strong constitution till within a few years. Rain, snow, or frost, never kept him in; and up to eighty, Dr. Cumming (whose church he attended in London) says he only once saw him wear an overcoat. His finely-profiled head and piercing eye, and well-defined features, are powerfully shown in the expressive bust, modelled thirty years ago by our mutual friend the late Thomas Campbell. He was frank and plain spoken, occasionally even to roughness; no flatterer, prudent in council, and firm in his opinion when once formed. He was a man of the highest honour, integrity, and independence." So far Prof. Donaldson. We shall have evidence of some of these characteristics of Mr. Burn as we go on. About the year 1830 Burn became acquainted with Kemp, afterwards the architect of Scott's monument, and proved a fast friend to him through life. Kemp at that time, after a somewhat chequered career, was working as a journeyman joiner in Edinburgh; Burn was busy with the plans of a princely house, to be erected at Dalkeith, for the Duke of Buccleuch,—a building which, I need not say, was never erected,—and having heard of Kemp's ability as a draughtsman, he employed him to make some drawings. Instead of making drawings, Kemp commenced to make a model of the part of the building with which he was entrusted. Burn was greatly pleased with the model, and in the end commissioned Kemp to make a model of the whole palace. On this work Kemp was engaged for two whole years. The result was a very beautiful miniature palace, which is still to be seen in the vestibule of Dalkeith House. It is pleasant to know that the familiar intercourse between these two eminent men resulted in the hearty recognition by the elder architect of the architectural abilities of his more humble friend. In the year 1838, when Kemp's design was the one most favoured for the Scott Monument, and great and persistent opposition was offered to his appointment on the ground of his being an obscure and uneducated architect, it was Burn who stood forward in his defence, and successfully assisted him to the appointment which was the crowning triumph of his life. I find in *Chambers's Edinburgh Journal* of the year 1838 a description of the incidents connected with the competition, and when exception was taken to the important national work being handed to a man nearly unknown, Mr. Burn, we are told, "an architect of first reputation, attested to the committee his great admiration of the elegance of Mr. Kemp's design, its purity as a Gothic composition, and more particularly the constructive skill exhibited throughout in the combination of the graceful features of that style of architecture in such a manner as to satisfy any professional man of the correctness of its principle, and the perfect solidity which it would possess when built." The effect of this hearty commendation of the design by Burn was, that Kemp got the work to do, to the successful result which we all now know.

About the year 1842 or 1843 Mr. Burn found his business increasing to such an extent that he deemed it necessary to assume as his partner Mr. David Bryce, who, previously to that, had been his principal office assistant. Thereafter, for a series of years, business was carried on under the well-known architectural names of Burn & Bryce. In the year 1844, Mr. Burn removed to London, leaving Mr. Bryce here, the business still being conducted in the name of the firm. So many of Mr. Burn's clients were in the ranks of the aristocracy who reside in London for so many months of the year, that no doubt it facilitated the despatch of business when Mr. Burn was himself resident there. The connexion between the two partners seems to have been dissolved about the year 1850. In the "Edinburgh Directory" of that year Burn's name drops out for the first time.

It is interesting to know that Burn gave very hearty assistance to Billings in the preparation of his great work "The Baronial and Ecclesiastical Antiquities of Scotland," published between the years 1845 and 1852. It is understood, indeed, that the publication was mainly set on foot by the generous advance of 1,000*l.* by Mr. Burn. In his London career the tide of Mr. Burn's success never ebbed. His commissions became more numerous and important; his employers were the highest in the land.

During the later years of his long life, he seems to have acted as official assessor or adviser to the Government as to the public architectural work. For example, I find in Sir G. Scott's "Life," that in the year 1856 there was a competition among all the best architects of London for the Government offices,—the Foreign and War Departments,—the buildings at the south end of Whitehall, erected ultimately, and very much against his will, in a Classic style, from the designs of Sir Gilbert Scott. In that competition Burn acted as one of the three architectural assessors, the other two being Prof. Cockerell and Fergusson, the author of the "History of Architecture." Mr. Scott had a long and disagreeable battle to fight with the Government of the day, headed by Lord Palmerston, whose ideas on architecture were entirely classical, and therefore entirely antagonistic to the appointment of Scott, and also with the rival architects whose designs had not been successful. In this disagreeable squabble Scott acknowledged his deep obligation to Burn. He says in his Memoirs, "Mr. Burn did not go strongly into the question of style, but took the matter of my appointment up in a determined and sturdy manner in the light of upsetting an unjustifiable combination against a brother architect. He stood by me most manfully and sternly." This reflects all the greater credit on Mr. Burn when we find a page or two before that he and Scott were almost entire strangers to one another. Mr. Burn's long and prosperous career was brought to a close in the beginning of the year 1870 in his eighty-first year. Of his works much might be said, but a few words will suffice. While in the course of his life he designed large and important public buildings his forte was domestic architecture. He was very strong in the arrangement of his houses. Professor Kerr says on this point, "I may say that Mr. Burn's plans for country-houses,—speaking as I do, I will not say with authority, but certainly from a careful study of the subject,—were all that one can express by the term faultless. He had so thoroughly acquired the mastery of the demands of that particular problem of plan,—and those demands are neither few nor small,—that he was able, so far as I could judge from a study of a number of his plans, to meet the demands of his clients in such a manner that I may safely say no one else in the country could hope to compete with him." Burn's mansion-houses are to be found in almost every county of the United Kingdom. But one or two might be mentioned by way of example,—Riccarton, for Sir W. G. Craig; Nidriore, for Col. Wauchop; Tynnington House, for the Earl of Haddington; Argowan, for Sir M. Shaw Stewart; Falkland, for Tyndall Bruce; Dartrey, for the Earl of Dartrey; Sandown Hall, for Earl Harrowby; Buchanan House, for the Duke of Montrose; Fonthill, for the Marquis of Westminster; and Montagu House, London, for the Duke of Buccleuch.

Probably the best known of his public works in Edinburgh are St. John's Church, Princes-street; the New Club, the Melville Monument, John Watson's Hospital, the Music-hall, and the alterations on St. Giles's. Mr. Burn has received much abuse for his treatment of St. Giles's, and I think with not much reason. No man can be blamed for not being ahead of his time. At the time Mr. Burn altered St. Giles's the revival of Gothic art was in its infancy. Pugin was but a boy, and had published none of the works which gave such an impetus to the study of the true principles of Gothic architecture. It is obviously, therefore, unfair to measure Mr. Burn's work at St. Giles's by the same standard which we have every right now to apply to our member, Mr. Hay, who is busy undoing Mr. Burn's work. Burn was not worse in his treatment of our church than Smirke and Wyatt were in dealing with the English cathedrals. We cannot but regret what he did in the way of removing and destroying the old work, but he was not a whit worse in this respect than the foremost man of his day. To condemn him in this matter would be equivalent to condemning Chaucer because he could not spell. I have said so much on this matter, and, indeed, on the whole subject of Burn's life, because so much has been said against him in connexion with St. Giles's that there seems to be some danger of its being forgotten that this much-abused man was one of the foremost architects of his day in a high and important department of his art.

Of his high personal character I have already said a little, but in closing this short and im-



perfect notice of him, I cannot do better than quote the words of a letter which I recently received from Mr. Macvicar Anderson, the accomplished secretary of the Royal Institute of British Architects. He says:—"It is rarely one meets with a character so independent [as was that of Mr. Burn]. His *esprit de corps* was remarkable, and I know many notable instances of his helping others to large works which he might have kept to himself. He invariably stood up manfully for his professional brethren, and since his death I have been struck with the frequency that the remark has been made to me, by men now in a good position, of how much they owed to his kindness and independence. He was a man of exceptionally vigorous character, and his influence among his clients, who were mostly members of the aristocracy, as well as amongst the leading men of the day in society, was remarkable."

You will agree with me that a little time spent in considering the career of Mr. Burn is well spent. In his manliness and honesty and independence, coupled with his apparent entire want of professional jealousy which so often disfigures the characters of professional men, he was a model to all young architects.

After the career of Mr. Burn it is natural to proceed with the story of the life of Mr. Bryce. After Mr. Burn left for London in 1844, there is no man in Scotland who will compare for a moment in the extent and importance of his practice with Mr. D. Bryce. The pre-eminence he retained till his death in 1876. He was born in the year 1803 in Greeniside, Edinburgh, and was educated at the High School. His father was a builder here, who united with his building a little architecture. David was apprenticed in his office, and there acquired that technical skill in drawing for which he was distinguished in after years. While yet a young man he became assistant to Mr. Burn in succession to his brother William, who had previously been principal assistant, and who had died early in life. In course of time Mr. Bryce was taken into partnership by Mr. Burn, and this connexion subsisted even after the year 1844, when Mr. Burn removed to London. But Mr. Bryce thereafter was regarded as the head of the firm here. As I have mentioned in Mr. Burn's life, it seems to have been about the year 1850, when the tie was ultimately dissolved. The vantage ground from which he started as the partner of Mr. Burn gave Mr. Bryce great opportunities even at an early stage of his career. We owe to him, early in his life, some of the noblest of our public buildings. Among his earliest works were the ornate British Linen Company's Bank, in St. Andrew-square; the Western Bank, also in St. Andrew-square, now the Scottish Widows' Fund Building, which has seemed to me always one of the most beautiful frontages we have in Edinburgh.

Such buildings as these two soon brought name and fame to the architect; and there shortly followed the Clydesdale Bank at the corner of George-street and Hanover-street, the Subscription Library in George-street, the North British Insurance Offices in Princes-street, and many others. Latterly, we are indebted to the genius of Mr. Bryce for some of the finest modern buildings in this city, Fettes College, the Bank of Scotland, the new Sheriff Court House, and the new Royal Infirmary. Those buildings form of themselves a splendid monument to any architect. In Fettes College and the Infirmary there is clear indication of a love for the French Chateau on the part of the architect. In the Sheriff Court House and the Bank there is seen the masterly command of classic art to suit the requirements of modern days which few but Mr. Bryce have been able to exhibit.

While great in his public works, Mr. Bryce was not less great,—greater, indeed,—in his domestic buildings. It may be said with all truth that he revived the Scottish Baronial style. He has been by far the greatest master in that department. When we compare the buildings designed in this style, applying the beautiful and quaint features of our national art to modern building with the baronial edifices of Elliot and Graham, and even of Burn, with those prepared by Bryce, the contrast is startling. Previous men put on here and there a Scottish feature, which sometimes was and sometimes was not appropriate. Bryce's Scottish Baronial seemed natural to him,—it was his native Doric.

Notable illustrations of this are Cortachy, Forfarshire, the seat of the Earl of Airlie;

Ballikinnan, the seat of Mr. Archibald Orr Ewing; Castle Milk, near Lockerbie, for Mr. E. Jardine, M.P.; and Kimmerghame, the seat of Mr. A. Campbell-Swinton.

Mr. Bryce's professional life seems to have passed through three phases. We have first the severely Classical style, which might be naturally expected from a pupil and partner of Burn, in the United Presbyterian church in Lothian-road, which, I understand, was his first commission, and the Widows' Fund and British Linen Co.'s Bank; then we have the Scottish Baronial of Cortachy and Ballikinnan. Latterly Mr. Bryce seemed to have been infected with a strong love for French art, of which we have a very fine specimen in Fettes College, and a more plain example in the Royal Infirmary. He designed in all these styles apparently simultaneously, and in all with marked success. I know of no architect to compare with Mr. Bryce in the success which attended his efforts in almost all styles. Other men distinguished themselves in one walk, in one style. He gloried and was successful in many styles. The only exception which might be taken to this statement is in Gothic art. I am not aware that he has left his mark here as on the other departments to which I have referred.

After enjoying the proud position of being the foremost architect of Scotland for a period of twenty-five or thirty years, he died in the year 1876, in the seventy-third year of his age.

Apart from his own peculiar studies, Mr. Bryce was a man of wide general attainments. Although somewhat rough in manner, he had a kindly heart, and he was universally esteemed alike by his servants and his employers.\*

#### ART IN COSTUME†

LET us now turn a critical eye upon male costume. One of the most obvious things about a man's everyday dress is its ugliness. I say his *everyday* costume, because, when on pleasure he is bent, he may wear pretty much what he likes; and, as a matter of fact, when footballing, boating, bicycling, cricketing, walking, or otherwise enjoying himself, he does adopt a dress which is both sensible and picturesque. It is only when he wishes to make an impression, when he is on business, or paying a call, or going to worship, or performing some other conventionality, that he considers it absolutely necessary to be particularly inartistic and uncomfortable. Our "Sunday best," our go-to-meeting clothes, are those most open to ridicule, unless it may be our evening dress. Contemplate for a moment a man on his way to worship. He is a walking illustration of the doctrine of Evolution. Were his hat, his coat, or his trousers created? No, they were evolved. His hat,—his top-hat, his chimney-pot, his stove-pipe,—is but the carcass upon which his ancestors were wont to display ribbons and knots, and other gauds. In itself it is both ugly and uncomfortable. In winter it proves a vast roof upon which rain and snow may collect in order to be the better discharged upon the shrinking form beneath, or otherwise it has to be protected by an expensive umbrella. We first buy an expensive hat to protect a too often worthless head, and then we buy an umbrella to protect the hat. In summer it becomes less a roof than an oven, in which the head is slowly baked. Whether off or on it is an encumbrance. When off, the question is what to do *with* it; when on, the question is how to do *without* it. And yet there is nothing so absolutely a symbol of civilisation as the top-hat,—a fact which furnishes some food for reflection to the philosopher.

The coat has several of what, I believe, are called "rudimentary organs." Just as in the human skeleton the few useless end bones of the spine are held by science to prove that man once had a tail, so the buttons at the back of a man's coat have their tale. Few people know why they invariably appear. I once asked a fashionable tailor what was their use. He replied, "to mark the waist." They are often put too low down to serve this purpose; but why should a man want his waist marked? And, if he wants it marked in one coat, why not in another? As a matter of fact, the only reason for the existence of these two buttons is that they are a survival from the time when men buttoned back the long flaps of their coats

in order to walk more freely. We have no flap<sup>a</sup> now, then why keep the buttons? Another rudimentary organ may be found at the end of the sleeve. There is always a cuff marked, generally by a double row of stitches, which perform no useful service, unless it be to remind us that our grandfathers had facings to their sleeves, and that those little buttons at the end were of real use when the sleeve was tight at the wrist.

Another necessary feature of the coat is the collar. In old times this collar was of some service; it was large, and turned up well in inclement weather; in order to allow of its buttoning, a nick was necessary. But though we hardly ever think of turning up an ordinary coat-collar, and find it of little use if we do, we still preserve it and the nick as a survival. Regarded with the serene eye of art, a Sunday coat is a contemptible article.

But the worst and ugliest feature in modern costume is the trousers. Previously to the beginning of the present century this ungraceful article was unknown. In the far distant past, the Phrygians had worn trousers, but they were loose and of thin material, falling into pleasing folds. But nowhere that I know of, whether on vase or wall, in missal, window, or book, do we find the shape of the leg concealed in the way in which the nineteenth century conceals it. Why is this so? Why are these things hid? Are the calves of the present day longer than of yore? or is it that we have grown honest enough to despise padding them, and are obliged therefore to hide them away? The exact reasons which led to the introduction of trousers are perhaps hardly worth seeking; they seem, however, to have been evolved at the mere dictate of fashion from the tight trousers and Wellingtons of the early part of the century, these, in their turn, having grown from the knee-breeches and stockings of fifty years earlier. But what is important to bear in mind is that history has no record of a garment at once so simple and so ugly as trousers. We are going clean against all precedent in shrouding our limbs in cloth funnels devoid of graceful shape and incapable of folds. And this departure from ancestral wisdom has no particular advantage to recommend it. Trousers are not economical, inasmuch as they get baggy at the knee long before they are worn out; they are always getting dirty at the ankles. They are not specially adapted either for cold or for wet. On a wet day it is the part from the knee downwards that catches the rain and necessitates changing the whole garment. Indeed, it is the way in which they ignore the knee-joint which renders trousers practically so objectionable. It is at this joint that they drag, and not only spoil their own shape, but inflict a sense of tightness over the whole body by means of the braces.

The more discarding of trousers, and substituting knickerbockers and stockings, would effect a great reform in male costume, a more striking and salutary change than any other mere detail, except perhaps the abolition of the Top Hat.

It is almost a waste of breath to declaim against trousers. Their hideousness is so generally admitted. Sculptors and painters have found them quite intractable, and resorted in despair to clothing men of the nineteenth century in Roman drapery. Examine what record of costume you like, and you will always find the shape of the lower part of the leg either displayed, or clothed with an interesting boot, until you come to this century. Turn over the pages of *Punch*, and you cannot fail to be struck with the superiority of knickerbockers over trousers from a picturesque point of view; while, for comfort and utility, they are equally to be preferred.

This substitution of knickerbockers or knee-breeches for trousers is one of the pressing reforms of the day. The change is so simple and yet so effectual. The next is the total disuse of the chimney-pot hat, and the more frequent use of soft material as a head covering. A "wide-awake" or "billy-cock" hat has capabilities, while the "Tam-o'-Shanter" is an excellent article ready to the head. For ladies, too, the "Tam-o'-Shanter" is extremely picturesque; while head-brimmed felt hats, straw hats, straw bonnets of simple shape and decoration, are all worn now and can be defended on principle. Master the principle, and the supply of admissible hats and bonnets will quickly increase. If we never wore anything

\* To be continued.

† A paper by Mr. J. A. Gatch, read before the Architectural Association on the 19th ult. See p. 636, ante.



which could not be defended on principle, we should be much more artistically dressed, and should have to lay aside a good many garments.

For winter-wear, hoods of various shapes would be found very comfortable, and would add greatly to the picturesqueness of our costume.

Turning to the improvements possible in coats, I am not prepared to condemn the present costume in the wholesale way in which trousers justly suffer. The present arrangement of coat and waistcoat is convenient, if rather ludicrous. We might well dispense with tail pockets and those rudimentary buttons. Let the coat be cut according to the figure rather than according to the cloth, but do not forget that inside pockets are essential, and that too many buttons prevent easy access to them by the wearer, while strangers who desire surreptitious access will scarcely be deterred by an extra button. The sleeves might with advantage be cut to fit the fore-arm more closely, and the collar might with advantage be altered in shape; this would undoubtedly affect the disposition of the shirt. If the coat-sleeves were tight and the collar buttoned high, there would be no necessity, scarcely a possibility, of starched shirt front and cuffs; consequently no necessity for a shirt at all. What then? Is a linen shirt a *sine quâ non*? Not at all. At present its only use lies in the collar, cuffs, and shirt-front appearing; do away with the shirt-front and cuffs and you may then discard the shirt, only you must wear a thicker jersey. Suppose we adopted a regular seaman's jersey. Its collar might appear above the coat, its cuffs below the sleeves; let it be any colour you like, white or otherwise. Such a costume would certainly be more simple and artistic, and as for its oddity, that is a mere matter of custom. We could then do without a waistcoat; the watch and other small articles might be carried in a band round the waist, the coat worn usually buttoned up, but if it were left open it would not display the same kind of *dishabille* as now; while a necktie would be optional, according to the cut of the jersey collar.

If it were thought desirable to ornament the coat it might well be done in the manner already indicated, by making the necessary turning-in of the edges ornamental. That was the system which the Greeks adopted. They ornamented the edges of their garments with a running pattern, and then according to the way in which the garment was worn this pattern varied in effect. We might adopt the same principle, though its application would be different.

For summer, a very practical and useful feature might be introduced, by simply having short sleeves to the coat, and showing the jersey down to the wrist; for in summer, as every one knows, thick, flapping sleeves are a great inconvenience.

But these suggestions are, perhaps, too utopian, and their adoption would, after all, become apparent only on a close inspection. The general outline would not be affected by them to any great degree; therefore if we must wait for them, let us take comfort from the thought that there is not the same pressing necessity for them as there is for the adoption of more beautiful leg-gear. Our coats are not so ugly as our trousers. If the coat fits well, and buttons up high, no great harm will be done. Open shirt-fronts for general wear are both inelegant and unhealthy. What is the good of wearing an open front, in order to put a chest-protector underneath it? A little care bestowed upon the collar and necktie will well repay the trouble, for that is the focus of male costume,—the place where the eye naturally lights in conversation, and a small piece of bright colour is very "precious" in these days of sombre hues.

There is much room for improvement and attention in the colours of our clothes. Of all the horrible inventions of feeble cloth-makers, the shepherd's-plaid pattern is the most dreary. A man, dressed in a black coat, shepherd's plaid trousers, and a nondescript artificial necktie, is a sight to rouse pity in his bitterest foe.

Black is much too freely used nowadays, though rather less than formerly. There is no reason for it, except a desire to be in the fashion. Browns and dark greens, blues and purples, are all to be had. Black is quite admirable in small quantities; but, just now there is too great a sameness in our dress, both in colour and cut.

Avoid artificial neckties. If you cannot tie

one yourself, learn. Who, that gave the matter his serious consideration, would consent to wear a stiff board on his bosom, carefully made to look like folded cloth, and with a pin stuck in that does no good, and is only there for appearance? Yet, I believe, many of the heathen do wear such things. If you have a pin that you want to wear, by all means wear it, only choose for its display a necktie whose structure requires it, and not one where it does no good whatever.

Then as to gloves, if you want to keep your hands warm or clean, wear them; if not, don't. If, however, you prefer to belong to the unthinking herd, by all means wear them whenever you think fashion dictates; wear them on a hot day in summer and spoil a pair every time you put them on; or else carry them in your hand, and let the world know that you can afford to buy them, but not to wear them.

But more important than the covering for the hand is that for the foot.

The boot is not at present a satisfactory article as regards appearances, though it answers its purposes well enough. It is easy to put on and off, and keeps out the weather, but its lines are not graceful; the leather is generally too stiff, and refuses to go into delicate wrinkles. This general stiffness has another serious drawback, namely, that it takes a good deal of time for the boot to become fitted to the foot, and during that operation the foot naturally suffers. If boots were made of more pliant material this difficulty would be obviated. Whether they would then be equally weatherproof I must leave to professional judgment. One thing is beyond dispute, that to distort the foot in obedience to fashion is contemptible folly. To wear boots that are too small, in the vain idea that little feet are beautiful, to cramp and crush the toes into a pointed boot because some one else does so, are marks of a feeble intellect, and show a plentiful lack of artistic instinct. The beauty of a foot or a hand does not lie in its size, but in its shape. The size varies roughly with the stature. A large person will necessarily, unless deformed, have a larger hand and a larger foot than a small person, and for that large person to cram his extremities into coverings too small for them indicates that his mind has not grown apace with his body (I use the masculine pronoun here merely for the sake of convenience—difference of sex makes little difference in folly).

The first elements of a good boot are that it should keep out the weather and fit the foot, whether the foot be large or whether it be small; that its sole and heel should be of nearly equal height, so that the foot may be in a natural position. High heels are as injurious in their way as tight lacing. They are not only harmful, they are worse,—they are ugly. They are contrary both to art and to nature.

There are a few simple improvements which might be made in boots: a more pliant material; for summer wear and fine weather, boots or shoes pierced with ornamental patterns showing the stocking through; for wet weather, boots reaching half-way up the calf of the leg.

The boot naturally brings us to the end of our subject, but a few words in summing up will serve to emphasise the principal points of these remarks.

Let us not despise costume. If we ourselves are indifferent to it, other people are not; and we dress as much for others as for ourselves. This advice is, of course, addressed to men, for no one supposes that ladies despise costume. I do not ask them to spend more time on their dresses than they do now. Far from it, but what I do ask is that the time should be better employed. Do not regard fashion as a god to be worshipped, but as a friend to be consulted. Master the principles of art in costume, and work them out for yourselves, taking hints from the prevailing fashion, if suitable to your particular characteristics. Avoid all kind of shams. It is difficult to say which are worse, shams which do deceive, or shams which do not; the latter are, perhaps, the more contemptible. Aim at simplicity and quiet good taste, and bear in mind that no great revolution is required to make our present costume quite pleasing. In ladies' dress the chief desiderata are greater simplicity and intelligibility in the folds, and a determined opposition to puerile decoration. In men's dress the chimney-pot and the trousers are the principal eyesores. For the rest, the more we study the subject the more improvements we shall see, and the easier we shall find it to make them. Let us work on the materials at hand, and not alarm every one

by changes which would seem fantastic. By always selecting the higher types, and steadily discouraging the lower, we shall gradually evolve a logical and beautiful costume, but this cannot be done without an intelligent knowledge of the subject.

Wholesale revivals are to be shunned. If a particular style is dead, whether in architecture or any other art, the probability is that it was no longer deserving of life; and this wearing of stray garments fished up out of the Dead Sea of the Past is little else than affectation. We have to recognise the circumstances in which we live, and to adapt ourselves to them, at the same time recognising that history contains an invaluable store of hints for those who know how to use them. These attempts to revive Queen Anne costume, and the ancient Greek costume, as was actually done by a band of *dilettanti* in London, are very amusing and interesting as a pastime, but as serious efforts towards reforming our dress they are even worse than useless, because they throw an air of irresponsible affectation over the whole subject.

Perhaps the most striking feature about modern dress as a whole is its democratic tendency. Caste in costume has disappeared; the lord now dresses like the squire; the millionaire like his clerk. This is one of those tendencies of the age with which I should be the last to quarrel. What is wanted is that men and women should be judged by their innate worth, on their own merits, and not by the accident of birth, station, or wealth. And so with costume. Our dress should no longer be at the mercy of the fluctuating standard of unintelligent and capricious fashion, but should render itself worthy of being judged by the eternal principles of true art.

#### ABBAY PARK, LEICESTER.

THIS new public park was opened on Monday last by the Prince and Princess of Wales, in brilliant weather, and amid profuse demonstrations of popular rejoicing and loyalty.

For some years past the Corporation has been engaged in carrying out a work of great magnitude and importance, having for its object the prevention of the floods from which the town has of late years suffered so severely. These works have included the widening, strengthening, and deepening the channel of the river Soar for about a mile; the construction of extensive massive weirs and locks, and the lowering of the bed of the canal 3 ft. 6 in., so as to provide a free outfall for two tributaries of the Soar, discharging immense quantities of storm water. A handsome bridge, of three spans, has been thrown across the widened river at the Abbey, and another over the canal. These and other engineering works connected with the flood scheme have been carried out by Messrs. Benton & Woodwies, of Derby, under the direction of Mr. F. Griffith, the engineer to the Corporation, and are now nearly complete.

With this important contribution to the sanitary works of the borough, the Corporation have, with wise forethought and liberality, combined the scarcely less needed work of providing a place of healthful and elevating recreation for the dense masses of the working class population which the increasing prosperity of the town has gathered in its manufacturing quarters. A site, about seventy acres in extent, has been purchased, and laid out as a park and recreation-ground. The site is well chosen. It is situated on the north side of the river Soar, commanding a view of the ruins of Leicester Abbey, the mouldering stone walls of whose demesne border the opposite bank of the stream, and its connexion with "the last scene of all, that ends the strange eventful history" of Wolsey's life, is enough to render it interesting to every Englishman; for within sight is the "little curth" the old man came to crave wherein to lay his bones.

The Park has been designed by Messrs. Barron & Son, of Elvaston, near Derby, the engineering works being carried out by Mr. Griffith, the Engineer to the Corporation. The excavated earth resulting from the flood works has been utilised to form high banks and mounds, and to give to what was a level swamp a pleasing broken and undulating surface. A grand drive sweeps from the principal entrance quite round the park. In the centre of the grounds, and at the head of a large artificial lake, is a high mound surmounted by large



blocks of rockwork. At the other end of the lake is a refreshment pavilion, surrounded with flower-beds and lawns for croquet, tennis, bowling, &c. Upwards of 33,000 trees, many of them of the choicest kinds, have been planted, besides thousands of shrubs.

The architectural work has been entrusted to Mr. Tait, architect, of Leicester. The two lodges at the principal entrance, as well as the entrance gates and piers, are in the Tudor style of architecture. The piers are embattled, pinnacled, and crocketed; the central one bearing a bronze tablet, commemorating the opening of the park. The materials are local red sand stocks, resembling in colour and size the old bricks of the Tudor period, with dressings of Derbyshire stone. Some of the gables and bay windows of the lodges are timber-framed, with carved barge-boards and enriched mouldings in dark-coloured wood, and the roofs are covered with red tiles. The ridges are covered with a lead ridge, the motif of whose design is the crest of the borough. The lodge at the western entrance is of a more rustic type of the same style of architecture.

The pavilion is also in the Tudor style. It consists of a spacious hall, surrounded on three sides by a verandah, supported on solid moulded oak posts and arches, and roofed with red tiles. The hall is lighted from glazed running doors, opening into the verandah, and also by clear-story windows, glazed with tinted glass. The walls are panelled throughout, and at each end is a handsome stone chimney-front. At one side of each fireplace is an oriel, commanding pretty views of the park. At the rear of the pavilion hall is a dwelling-house, for a curator. The total cost of the park will be about 50,000l.

It may be mentioned that the present chairman of the committee under whose direction the great undertaking, of which the park scheme forms a part, has been carried out, Councillor Underwood, as well as Alderman Chambers, the present Mayor, and Alderman Winterton, the High Sheriff of the county, his predecessors in the office, are all more or less directly connected with the building trade.

#### ST. SAVIOUR'S CHURCH, SOUTHWARK, AS A CATHEDRAL.

At a diocesan conference, which was last week held in St. Saviour's Church, Southwark, the Bishop of the diocese (Rochester) presided, and in the course of the proceedings adverted to the contemplated conversion of the church into a cathedral. Alluding to a Bill now before Parliament for abolishing the present objectionable way of raising the salary of the chaplain of St. Saviour's, and vesting the patronage with the bishop, his lordship said that when that Bill became law, he should, with as little delay as possible, consider the restoration of the fabric, in the firm belief that the spiritual interests of the surrounding population would be vitally stirred and helped when that church, in its pristine beauty, became the Cathedral of South London.

At the same conference, a scheme was also agreed upon, involving the formation of a fund to be called "The Bishop of Rochester's Ten Churches Fund," with the object of raising not less than 50,000l. towards the erection of at least ten new churches in South and South-east London.

#### THE PERGAMANEAN RELICS.

The great statue of Athene, from the altar of Pergamon, has now been placed in the so-called Assyrian Room at the Berlin Museum. This work is a copy or imitation of the celebrated statue of Athene, by Phidias, which, in ancient times, was at Athens. The Pergamanean imitation now in the German capital is of heroic size, standing 8 ft. 6 in. high, without the head, which has, unfortunately, not been found. Otherwise the work is in a very good state of preservation. The goddess appears clothed in a garment which has many folds, and is fastened over the hip, but in the upper part of the body does not lie tight or close to it. Over this, on her shoulders, the goddess wears a scaly jacket, reaching half over the bosom. On this the separate scales are excellently preserved, and show exquisite workmanship. The garment covering the lower portion of the body lies pretty evenly all round, and reaches in rich folds to the ground, only the left leg, which is slightly advanced, being indicated beneath the covering.

A few portions of the statue near the feet have been broken away, but the socle capital is very well preserved. This capital shows in relief festooned garlands, and between them rosettes, and eagles with outspread wings. This work, like the Apollo and other groups belonging to the great altar which have already been carefully cleaned and put together in their original form, is an object of great interest to the visitors to the Berlin Museum.

#### PRINCIPAL STAIRCASE, THE TOWN-HALL BUDAPEST.

THE second capital of the Austrian Empire shows the invigorating effects of a new constitutional era, especially in the activity with which building operations are carried on. Architecture, in conjunction with sculpture and painting, is beginning to play a most important rôle, the development of which is steadily proceeding. During the last decade, royal, government, municipal, and private buildings, remarkable either for their usefulness or splendour, have been springing up, which have added considerably to the number of existing edifices with a claim to excellence. A numerous body of architects, who have mostly received their training abroad, have taken up their residence in Budapest, and are assisting in converting it into a modern town. We have, before now, illustrated several of the buildings erected here, and in our present number we publish a view of the staircase of the new town-hall, a building which was some few years ago completed,—a suggestive addition, moreover, to the series of staircases we have from time to time given.

The city owns property of a value of 45,000,000 florins, and has an annual income of 6,000,000 florins, a great portion of which has been devoted to the erection of public buildings. The construction of the new town-hall was temporarily interrupted on account of the changes which were made in the original plans. The basement had already been completed in the Gothic style, when the municipality, deeming the expense attached to that style too great, desired the architect to adopt the less expensive one of the Renaissance. The latter, Professor Emerich Steindl, chose an early style of Renaissance, so as to bring the whole building fairly in harmony with the Gothic portion, the basement, already constructed.

Both the street front and the courtyard façades of the Townhall are of brick, with stone mouldings and glazed coloured terracottas. The edifice is the first building in which the latter material was employed in Budapest. In the centre of the principal portion, and running through the second and third stories, is the council-chamber, a room 67 ft. 3 in. long, 48 ft. wide, and 42 ft. 3 in. high to the coffered ceiling. Half-way up a gallery runs round the hall, which receives its light from five windows on each side. The decoration is strictly architectonic, the material real marble. This decoration also includes two marble chimney-pieces and six frescoes at the ends of the room, containing allegorical subjects, painted by Lotz. All the fittings are of oak, and the doors of walnut, with bronze ornaments. Besides seats for the president, the magistracy, and the press, there are 306 seats for the representatives. The chamber is entered by the assembly-room. Communication between the various stories is effected by a five-flight principal staircase of iron, a similar staircase of three flights, and a spiral staircase. The principal staircase, which we illustrate, is from the design of the architect Von Detl. The stairs are of Karst marble. The ceiling is adorned with bays. The staircase is 45 ft. wide; the stairs are 9 ft. in width. The most remarkable feature is the transition from the stone pillars to iron in the double lobby of the ground-story. A model of the staircase was shown at the Vienna International Exhibition and is now in the Gewerbe-Museum of Budapest. The total cost of the building was not quite 800,000 florins (80,000l.). It is to be regretted that the edifice has been placed in a narrow street, some distance from the centre of the city.

**Slaughterhouse Reform.**—At the last meeting of the Council of the Society for the Reform of Slaughterhouses, a communication was read from Mr. Kennett, of Petersfield, intimating that he would give 200 guineas to the society towards the construction of a model abattoir, if in the course of two months four other persons would contribute the same amount.

#### SHORING USED AT THE ROYAL ALHAMBRA THEATRE.

IN giving some account, at the close of last year, of the works and decorations then carried out at "The Alhambra," Leicester-square,\* we promised some further information.

We illustrate this week, therefore, the shoring which was used at the Alhambra Theatre to support the dome during the removal of two of its main supports, for the purpose of widening the proscenium.

The dead weight borne on the top of each of the columns to be removed was about 35 tons, and that not brought on to it by various girders, &c., each of which might have been separately shored, but concentrated upon it by the inner curb of the curved principal of the dome. Added to this was the necessity for providing against the thrust of the dome on the outer walls when the tie at the head of the column was released,—a difficulty further enhanced by the fact, only discoverable after the beginning of the works, that the two columns were leaning over towards the centre of the building, through a slight failure in the dome, with the result that the foot of the principal had been pulled nearly out of the walls on which it rested at one end.

A gridiron of rolled joists, all strongly strapped together, was formed at the base of the principal at B B, surrounding the head of the column; at one end this was tightly pinned into the wall, and at the other carried out sufficiently far to be supported by timber shoring built up from the basement. When all this was steaded on shores of timber balks, and further strengthened by being tied back by long drum-iron tie-rods, carried through and nutted to the main walls, it was found that long lugs at the heads of the columns were embedded in the timber of the curb. It was, therefore, deemed impossible to remove the upper length of the column as intended, and other means had to be devised. The column, which in itself is 53 ft. 6 in. high, stood on a granite base raised on a brick pier in the basement, as shown at A A. The angles of this brick pier immediately below the base were cut away, and two rolled iron joists inserted, and beneath the ends of these were placed two of the powerful jacks which were used when the roof of the North-Western Railway Station was raised. The weight being brought on to these joists and jacks, the rest of the brickwork was cut away, the jacks were lowered, and the column, by its own dead weight, pulled itself free, and left the dome standing rigid and safe on the top of its temporary shoring, much to the satisfaction of all engaged in the operation.

The remainder of the works was comparatively easy. Heavy cast-iron struts were raised in a line with the old columns, and a riveted girder built up over them in position, on a staging erected above the proscenium. These works, which were carried on at the same time as the redecoration of the building, were completed in the course of a few days; and great praise is due to the contractor, Mr. Brass, of Old-street, and his indefatigable foreman, Mr. Jones, for the successful way in which they performed this troublesome operation.

Although the proscenium has been widened, the full benefit of it is not yet visible to the audience. The old and incongruous proscenium still remains, want of time having prevented its reconstruction; but it is intended shortly to substitute another, as designed by the architects, in accordance with the style of the house.

We may mention, though most of our readers will be aware of the fact, that the dome of the Alhambra is a remarkable and much-admired specimen of timber construction, and was designed by Professor T. Hayter Lewis. The architects for the new works were Messrs. Perry & Reed, of the Adelphi.

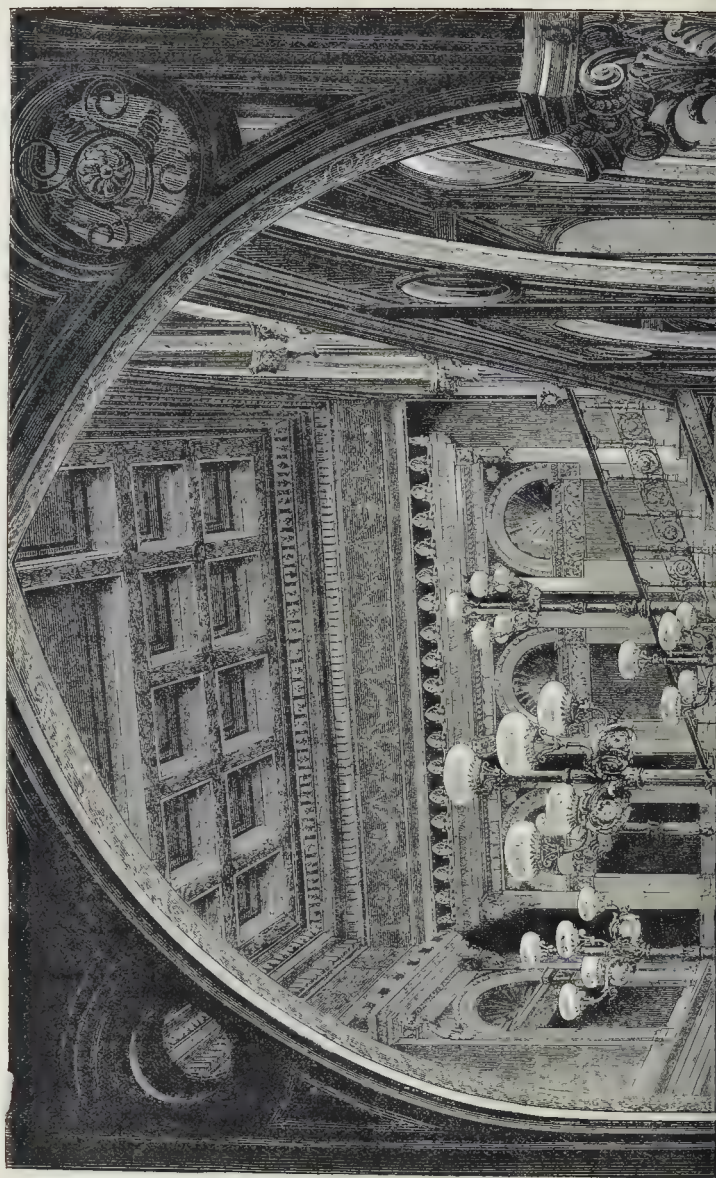
**Local Board Architects.**—A professional man writes,—Allow me to make a remark in the interests of our profession. I would call attention to the very unfair position in which architects are placed by Local Board officials, who practise as architects also, they being the actual custodians of plans and elevations deposited with the Board for all works in their district, and which they can copy or use at will, even in opposition to the architects who were compelled to send them in.

\* Vol. xli. (1881), p. 739.

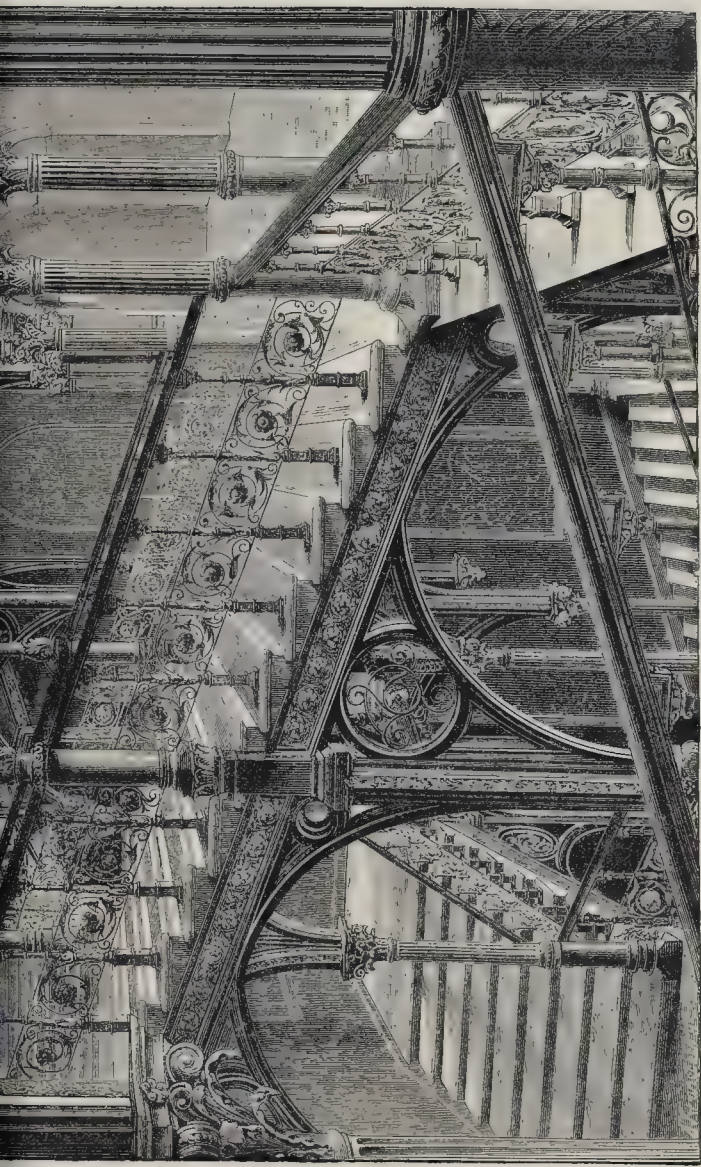




THE BUILDER, JUNE 3, 1862



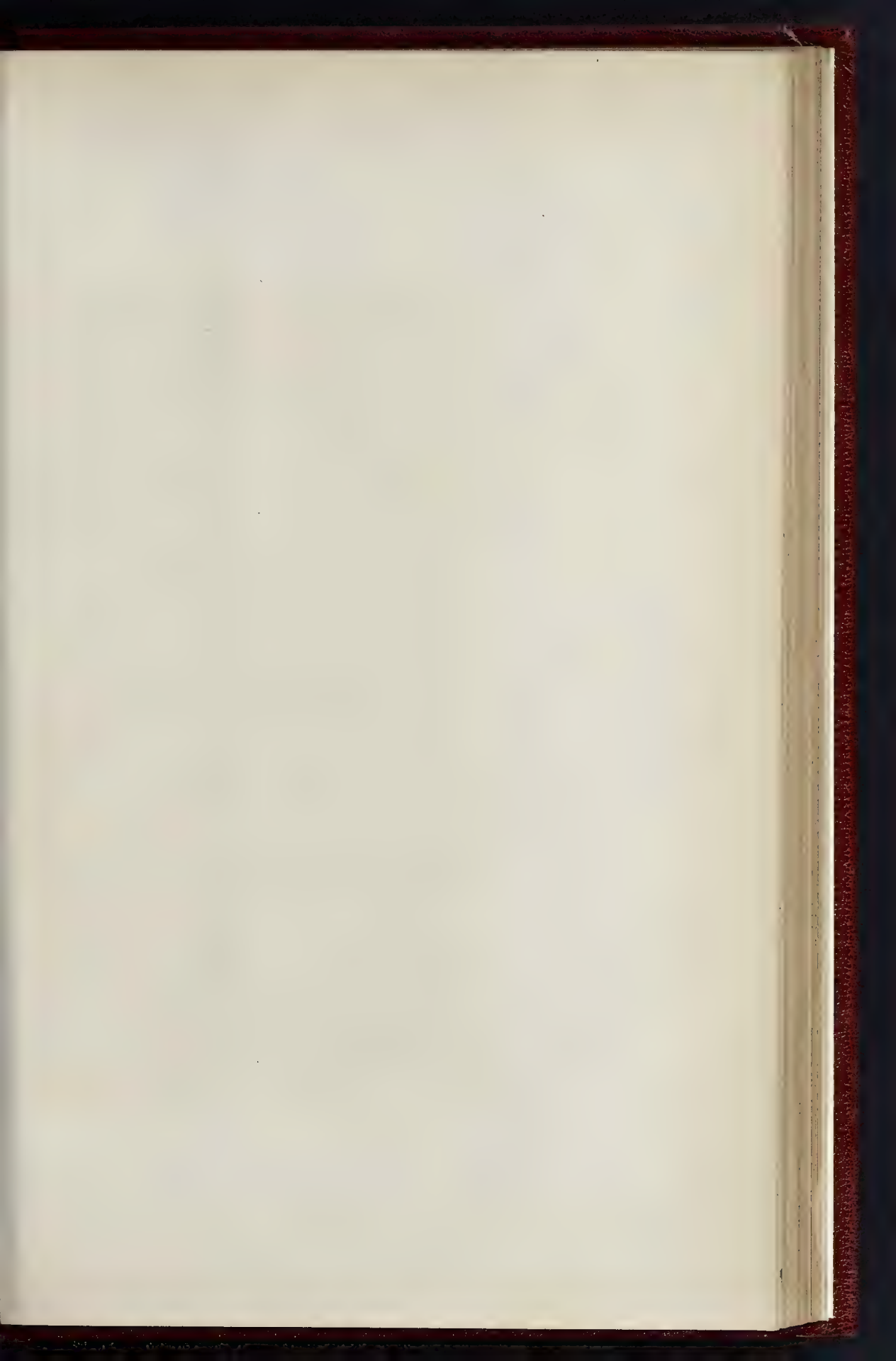




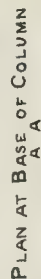
PRINCIPAL STAIRCASE, TOWN HALL, BUDAPEST.—HERR VON DETL, ARCHITECT.





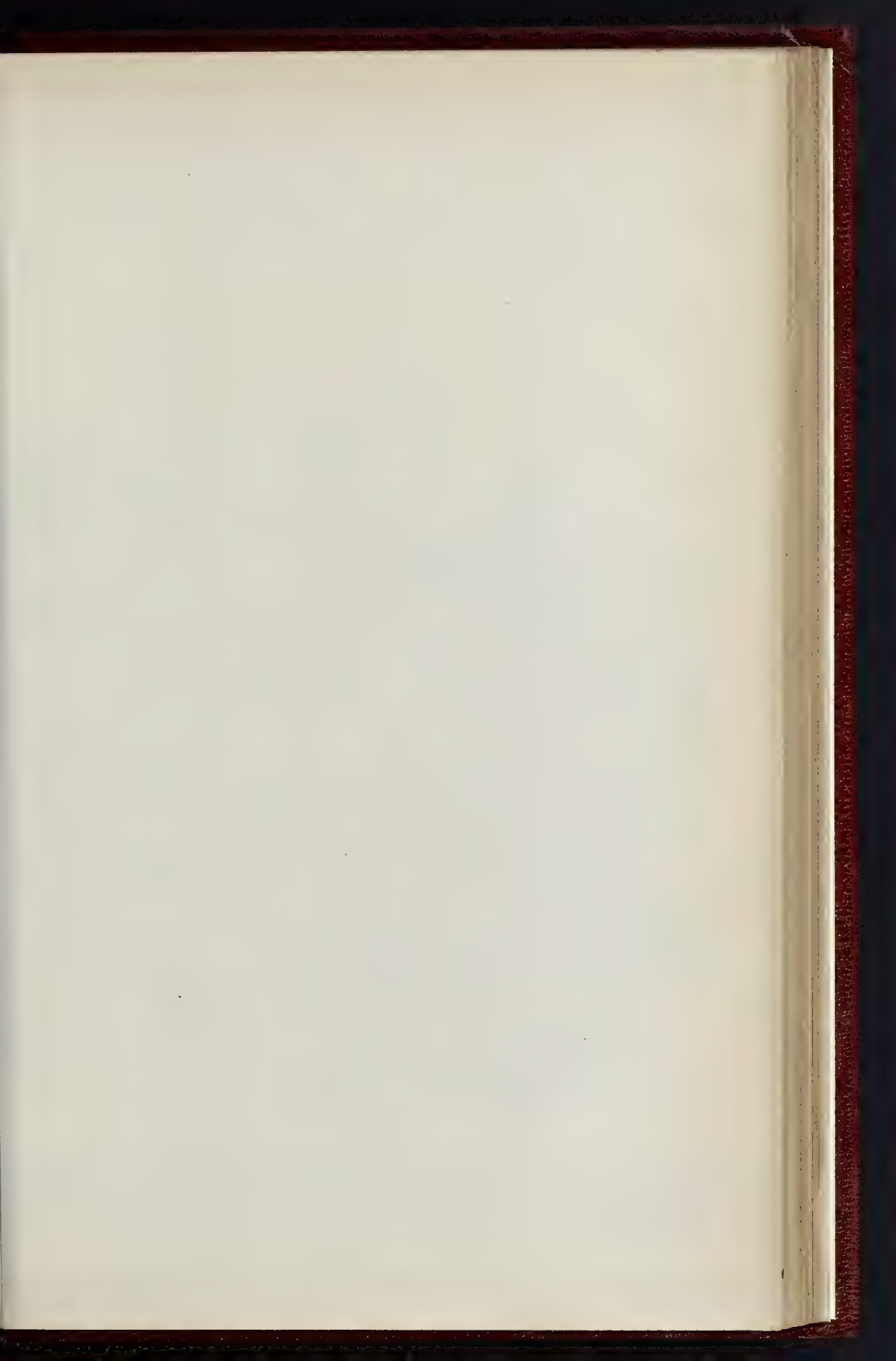


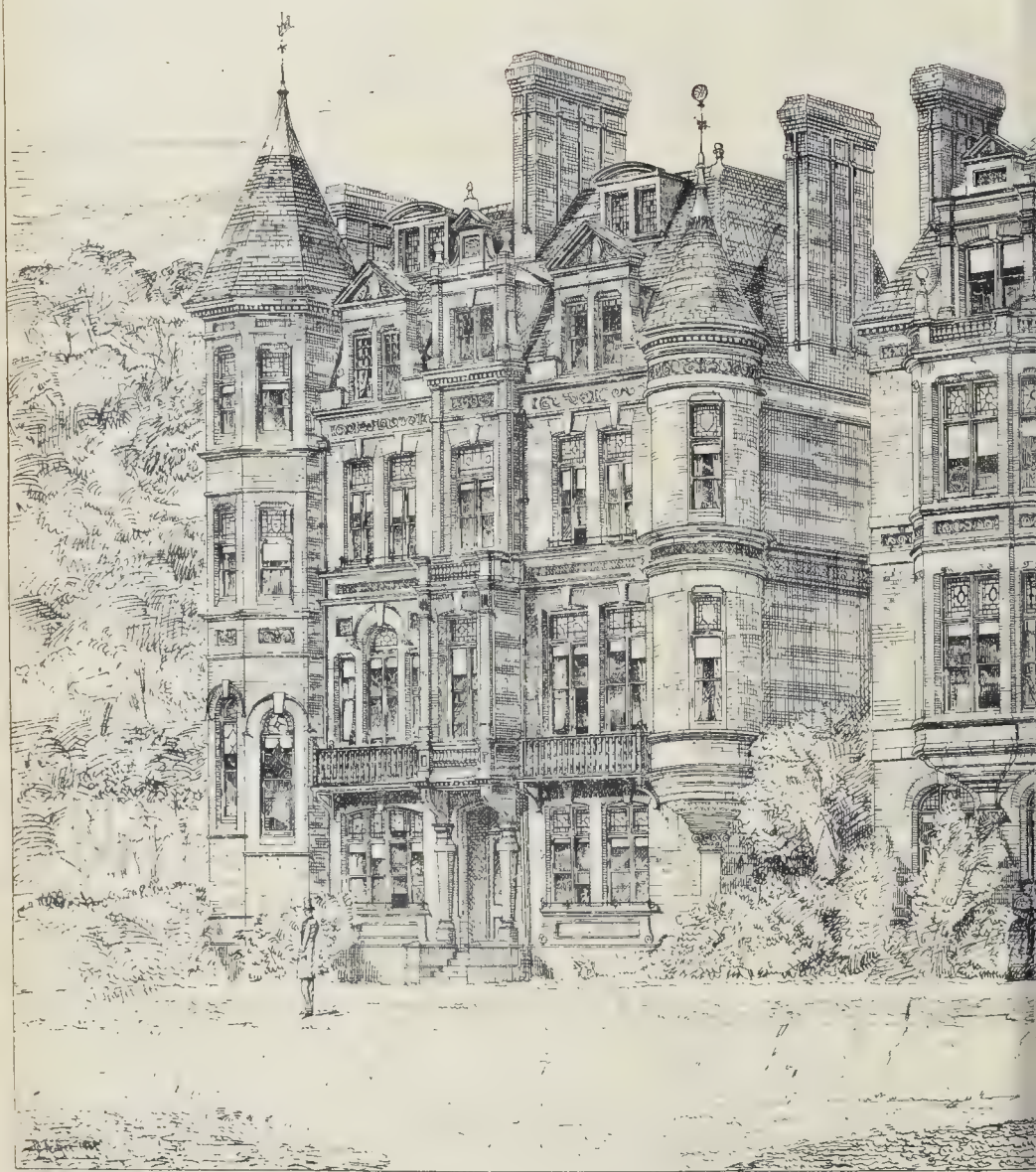
DETAILS OF SHORING USED FOR REMOVAL OF COLUMNS  
AND INSERTION OF NEW STANCHIONS.



NOVEMBER 1961

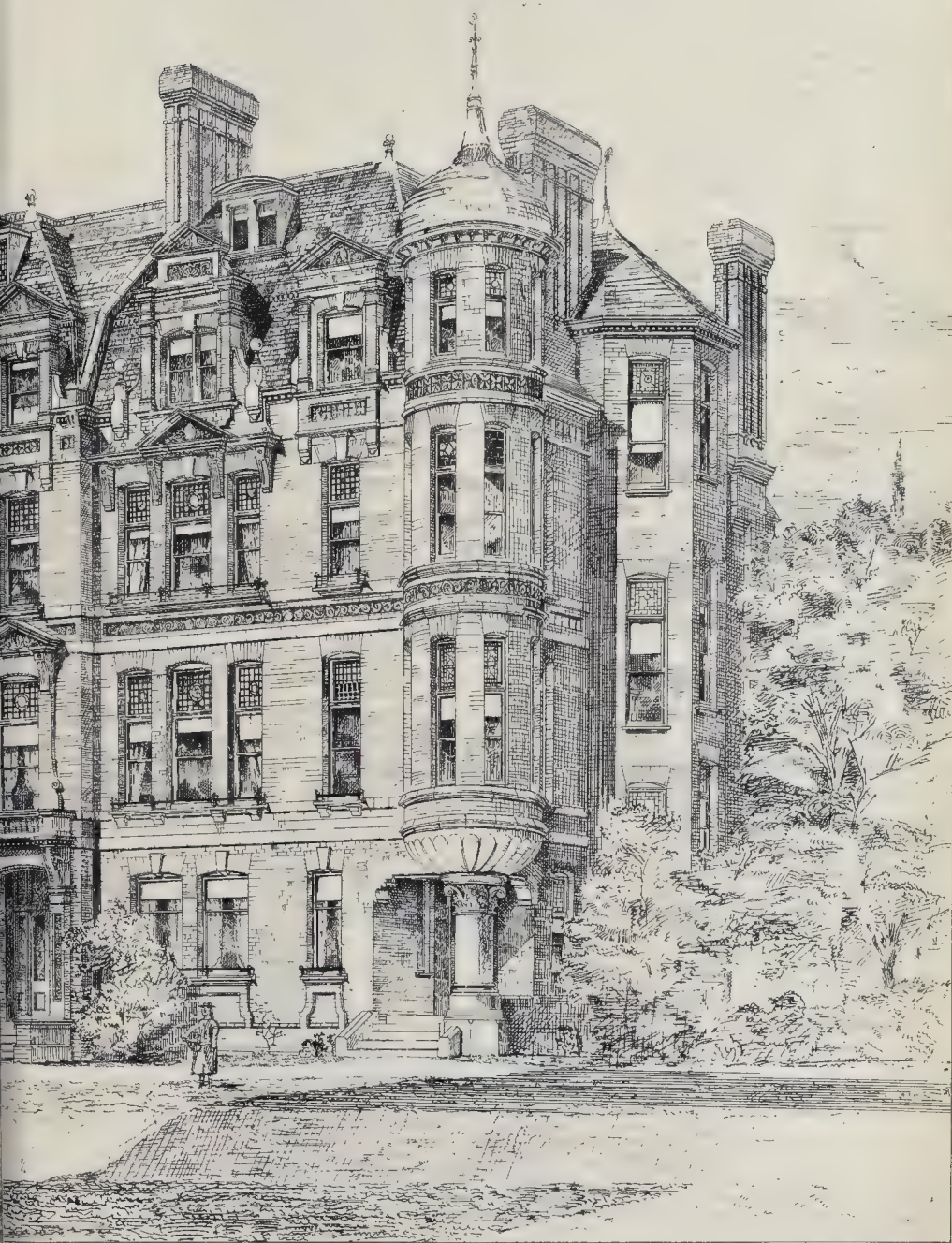






OF THE PAVILION CASTLE ST. HOLBORN, LONDON, E.C.





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H M Office of Works  
April 1982

C. F. Hall, Photo Latho Caple & Willora

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PLAN SHOWING SITE OF PROPOSED GOVERNMENT OFFICES, WHITEHALL AND CHANCERY CROSS.





## VILLA RESIDENCES AT WELL WALK, HAMPSTEAD.

THE view we give of residences at Hampstead represents four houses now erecting, and nearly finished, in the old and almost historic neighbourhood of Well-walk, Hampstead, celebrated for its chalybeate spring, and also as the resort, in his last days, of the poet Keats, whose seat, said to be the same used by himself, is within a few yards of the site of these houses.

The land around this "walk," a good deal of which belongs to the Wells Charity Estate, having become of late valuable, in consequence of the large quantity of building that has been going on in the neighbourhood, and in consequence of its close contiguity to the Heath, now secured for ever to the public as an open space, commands a high ground-rent, and the houses erected upon it are therefore of necessity large.

These four houses, which are erected in pairs, are of red brickwork, a large proportion being of gauged work, the red bricks of which are selected of a different tone or colour, the gauged work being the porches, the strings, the mouldings, the whole of the dormers, &c. Very little stone is used, but where it is used it is the red Mansfield. Polished red granite is introduced in the shafts supporting the circular angle turret, as seen in the view, and to the projecting corbel of the wide bay window. The roofs are covered with brown Broseley tiles. Nearly all the sashes have a portion made ornamentally, and filled with lead-lights.

The whole of the joiners' work of the interior is of pitch-pine, or pitch-pine and red pine combined, and is to be varnished. The entrance-halls, vestibules, and passages are to be ornamentally tiled. The ceilings of all the dining-rooms are divided by pitch-pine mouldings into panels, and the panels filled with diagonal boarding. The cornices also are of wood. The ceilings of the drawing-rooms are a combination of pitch-pine mouldings and plaster-work. Ornamental stone screens divide the entrance-halls from the staircases.

The planning and internal arrangements are dictated partially by the site, the level of which is a hill, rising rapidly from the front to the back, so that the land at the rear is level with what appears in the view to be the first floor; the entrance to each house is therefore off the level of the ground in front, and the principal rooms are on the first floor. With the exception of the entrance-halls and one room, viz., the breakfast-room, the whole of the ground-floor is devoted to the usual domestic offices. On the first floor each house has a large drawing-room, dining-room (with lifts from below), library, and boudoir; and above, on three floors, are the bedrooms, dressing-rooms, bath-rooms, and lavatories.

All four houses differ in their internal arrangements, although they contain much about the same general accommodation.

Special arrangements have been made with regard to the drainage and sanitary arrangements, the main drains of two houses being laid in an arched subway, formed between the two pairs. And a special deep intercepting drain at the back, laid parallel to the back fronts, is put in to take the drainage from the land, which at the rear falls towards the houses, with a view to keep them dry. Irrespective of this, the mode adopted and advised by an eminent architect has been used to keep the back portion of the buildings below the ground dry, viz., by forming a perpendicular layer of asphalt 1½ in. thick in the thickness of the wall joining the usual horizontal layer or damp course.

In case of gas being used in the principal rooms, each room has a horizontal shaft in the floor above, from the centre of the ceiling, intended for a globe-light to be attached to it; and this leads to a small triangular flue formed at the side of an earthenware smoke-flue, and which, being thus heated, has a current or draught upwards.

The original estimate for the four houses was 15,000l.; but this includes fittings of an ornamental character, such as glazed enclosures or closets for china, of which there are two or three in each house; also wrought-iron conservatories of which there are three altogether.

Mr. Henry S. Legg, of Christ's Hospital, London, is the architect, under whose superintendence the works are being carried out by Messrs. Perry, builders, of Tredegar Works, Bow.

Very few persons are aware of the once famous chalybeate water giving the name to the neighbourhood of these houses, viz., "Well Walk," which well or spring has served the inhabitants of Hampstead for upwards of 200 years, and for which of late the Wells Charity Trustees have erected an ornamental fountain or structure in the Walk. This is of stone, with a polished red granite slab, intended for an inscription, and a grey granite basin at the base to receive the water.

## PROPOSED NEW PUBLIC OFFICES, CHARING-CROSS.

By the courtesy of the Right-Honourable G. J. Shaw-Lefevre, First Commissioner of Works, we have received a copy of the official plan showing the site of the proposed new offices, and have thought it desirable to place it before our readers. As we have already pointed out in an article on the subject,\* part of which it may be as well to repeat, the site selected for the purpose is bounded on the east by Whitehall and Charing-cross; on the west by St. James's Park and the passage leading into the park adjoining the offices of the Metropolitan Board of Works; on the north and north-east, by Spring-gardens and the new banking-house recently erected by Messrs. Drummonds, and the banking-house of Messrs. Cocks, Biddulph & Co.; and on the south, by the Horse Guards and the Horse Guards' parade. It is also proposed to take the houses Nos. 53 and 54, Charing-cross, apparently for the purpose of affording a better entrance into Spring-gardens, and the house, No. 24, Spring-gardens, adjoining. The greater part of Spring-gardens, together with the passage therefrom into St. James's Park, and the small inclosed plantation upon each side of this passage, will also be absorbed, and is apparently intended to be built upon.

It will thus be seen that the site includes the Paymaster-General's office, the residence of the First Lord of the Admiralty adjoining to the north, the whole of the Admiralty buildings and the garden in the rear, the gunner's house and gun-shed, the whole of Spring-gardens, Spring-gardens-mews, and the streets formerly known as New-street, Spring-gardens, and Spring-gardens-terrace; St. Matthew's Chapel, together with the whole of the houses on the south side of Spring-gardens between the chapel and the passage leading into St. James's Park, five houses in Charing-cross (Nos. 37 to 41) north of Buckingham-court, and the houses on the east side of Spring-gardens backing upon the houses facing Charing-cross, as far as Drummond's Bank.

The houses fronting upon Charing-cross from the passage-way leading into St. James's Park to the street leading into Spring-gardens, with the exception of Nos. 53 and 54, Charing-cross, are not proposed to be taken. Messrs. Drummond's new bank, the Ship public-house, and Messrs. Cox's banking-house are not included within the limits of the land to be acquired. We shall have to return to the subject.

## THE ARCHITECTURAL REVIEW OF BELGIUM.

UNDER the above title a committee of architects in Brussels is about to introduce a monthly publication of great interest to the architects of Belgium and others. Each number will contain five plates, "phototypes," executed with the greatest possible care, and being copies of the most important, the most interesting, and the most original works of Belgian architects. It is, therefore, essentially a national publication, which cannot fail to occupy a distinguished place in the libraries of architects and builders. The committee which has taken the direction of this review will do well to satisfy the undoubted desire of engineers, sanitary inspectors, antiquaries, and archaeologists, that descriptions should accompany the plates. The main defect of many Belgian works of this class is the insufficiency or complete want of a descriptive text. This new review, it is stated, will be somewhat similar to the well-known French publication of M. César Daly.

**Society of Engineers.**—On Monday, the 5th of June next, in the Society's Hall, a paper will be read on "Railway Tunnelling in Japan," by Mr. T. M. Rymer-Jones.

\* Vol. xlii., p. 353.

## ENGLISH AND FOREIGN TECHNICAL EDUCATION.

THIS was the title of a paper by Mr. Edward C. Robins, F.S.A., read before the Society of Arts on the 24th ult. We confine ourselves to what the lecturer gave as the result of his own experiences in Germany:—

The Executive Committee of the City Guilds recently instructed Professors Armstrong and Ayrton to make a tour of inspection of the polytechnic schools of the German-speaking countries, with the view of determining the most suitable fittings and apparatus for the new buildings in progress at Finsbury and South Kensington. As a member of that committee, I volunteered to accompany them, and I met Armstrong at the beginning of January last at Strasburg, where a new university is being constructed, to cost, when finished, not far short of a quarter of a million of money. Besides the main block of the building devoted to classical learning, mathematics, &c., separate blocks of buildings, specially constructed under the supervision of the professors themselves, are being constructed for chemistry, physics, botany, &c. In short, it is to be a university and Polytechnic in one and the same institution, for high-class students. The architect of this princely foundation is the Professor of Architecture at Karlsruhe: thither we went to find a new technical chemistry laboratory, and school of agriculture and forestry, in addition to the former buildings of the Polytechnicum, with museums of specimens and models of every kind. Thence to Mulhouse, a manufacturing centre, visiting the model dwellings, the dye-works and calico-printing establishments, and the chemical schools, established by the manufacturers. Thence to Geneva, where Ayrton met us, and we, together, inspected the new university, chemical and physical schools. Thence to Zurich, at which celebrated Polytechnicum every science is taught, both pure and applied; here are separate museums of models for teaching physics, chemistry, machine engineering, architecture, drawing, modelling, agriculture, forestry, botany, &c. Here are nine professors of mathematics, 46 full professors, 54 teachers,—100 in all; 490 students and 250 auditors,—750 in all, which, however, is 500 less in number than used to be the case when this school (now thirty years old) had fewer competitors of its own kind, and felt less of the growing absorption of high-class students by the universities. Thence to Munich, to see the splendid new Polytechnicum there, the new university, chemical and physical laboratories, and Pettenkofer's Hygienic Institute, concerning which Dr. Benck writes me to Munich, its director, Dr. Pettenkofer, being the professor of hygiene at the university. It was erected three years ago, and was a part of the Physiological Institute. It is designed for the education of students in Medicine and Hygiene, and for practical investigations therein. Officers of health have to obtain its diploma. Thence to Vienna, where has long been a vast Polytechnicum for 1,500 students, a remarkable collection of models and objects for each department. Here are also new technological buildings, a new weaving and chemical school, just opened, &c.; everywhere the provision for first-class secondary education of a technical character is extending. It has been found to give forth results which point to this general extension.

At this point, Professor Armstrong went on to Gratz, to see the new physical and chemical laboratories there, and to Buda Pesth, whilst I and Professor Ayrton went to Dresden and Chemnitz, Ayrton returning to his London classes, after visiting Wurtzburg, while I rejoined Armstrong at Dresden, and visited the new Polytechnicum there. Thence to Leipzig, in which university Armstrong himself studied two years and a half. Here is a street full of separate new buildings, for chemical, physical, and other laboratories. Thence we proceeded to Berlin, where, besides the new university buildings for science, referred to before, is a large stone building, erected at the instance of local manufacturers, for special chemical analyses; there are fine laboratories attached, and students admitted, but certain of the work done is considered private to the members: it is a school of research.

Mr. Felkin has published a book on the "Trade and High Schools of Chemistry in Saxony," to which I must refer you, where



every kind of technical instruction is given, in both primary and secondary schools. Aachen was the last place we visited together: here is one of the finest and most elaborately fitted Polytechnics of the many buildings we saw; it is, in itself, a lesson in technical education, of a kind that we have no examples of in this country, not only in fitting, but in heating, ventilation, lighting, and electrical apparatus associated therewith. I spent the month of January in making this rapid survey, and noting the fittings, the chief purpose of our visit; and an impression of preparedness on the part of the countries we visited, to fight out the question of scientific superiority in technical matters, was left on my mind, that I should like to communicate to others. My belief is that the omission of high-class scientific education for the middle and upper classes, in England, is the true cause of our being apparently out of the industrial race of the period; and the movement which is now set on foot has come from the right quarter, viz., from the commercial and manufacturing centres, who begin to find its monetary value. In these schools everything is taught that can be gained at the universities, except the dead languages, while modern languages and the applications of modern science to art and industry are added, and the thoroughness with which they are taught is best evidenced by the fact that nearly all our own leading men have found it desirable to spend some years in Germany, and frankly to acknowledge we have nothing to equal it in England. All secondary education in Germany is more general and thorough.

Except to the extent to which mechanical work and testing materials is done in the engineering school at King's College, and at the University College, London, we found no workshops attached to any of the Polytechnics which we visited. Models of every kind of mechanical action, of every kind of machine, &c., there were, but these were not made by the students; in fact, manual labour is excluded from the Polytechnics generally, and only to be found in the intermediate trade-schools already described, and in them to a much less extent than is commonly supposed. Now, it is true that we have no such organisation in this country, but we are daily approximating it. The influence of South Kensington is making itself felt, and our secondary schools are introducing science little by little, while great efforts have been already made in some of the chief towns in England.

For example, at Owens College, Manchester, and the Grammar School; at Mason's College, Birmingham; the Yorkshire College, at Leeds; at Sheffield, Nottingham, Liverpool, Bristol, and elsewhere.

At the latter place the famous trade and mining school, so long established there, is about to be transferred to new quarters, at a cost of 30,000*l.*, and will be a monument of the munificence of the Society of Merchant Venturers. As their architect, I am enabled to state that no reasonable expense will be spared to render this a model school of the kind. Then, again, realisation of the complete scheme of the City Guilds will soon place London on a par with the other capital cities of Europe. The Central Institution will be an English Polytechnicum of the first order; the Finsbury College, or "technika," superior to its Continental prototypes. In conclusion, what have we to learn from all this? In the first place, to support all efforts and to improve the intelligence of the working classes; and, secondly, to raise the standard of professional excellence.

In a paper read by Mr. Slater at the Architectural Association, the importance of the study of the natural sciences and their application to specific industries connected with the art of building was forcibly insisted upon. Young men are too often pitchforked into the professions of engineer, architect, and surveyor, without any more relative preparedness than is the working man. Better preparation for articles of apprenticeship is the thing most wanted in the constructive professions. Apprenticeship is the best business school, but it might be improved on its educational side. The architectural and mechanical classes at the German Polytechnics, which extend over three years, and the work done, which I carefully examined, is of a better class than is usually understood; from the very first, the student has to work out the strains of every floor, or roof, or speciality in construction, and to delineate the same in skeleton diagrams attached to every plan he

draws. The mechanical draughtsman is not given a subject to copy, but only the parts of a machine, which he has himself to piece together, to realise the machine to be drawn, so that, from the rough sketches of the master, he has to thoughtfully work out in practical draughtsmanship the theory he has been taught to apply constructively. True, he is surrounded with models and drawings of every mode of construction and style of design, principles of motive power, its emission, transmission, and arrest; but they are ministering spirits, not arbitrary laws, fettering his freedom. At least, they need not be other than helps to his imagination. We enter our articles too early; eighteen is surely early enough, sixteen is the common time. The establishment of examinations at our institutes will certainly help to bring about a change in this matter, and soon it is to be hoped that, just as candidates for entry to the technical educational advantages to be hereafter obtained at the central Institution of the City Guilds will be required to produce certificates of having passed preliminary examinations at other schools of lower grade, so admission to the examinations of our professional institutes should be ultimately given only to such standards as shall be able to produce similar educational certificates of competency up to a certain point, which can only be fixed from time to time, as the means of obtaining such certificates shall have been increased. By this means, these professions will be aiding in the movement in which none can be more directly interested than they, and will prove their loyalty to our country in the best possible way, namely, that of raising the scientific tone of professional education, and fitting the students to compare with foreign competitors in the race for national pre-eminence in every good thing, but especially that of technical knowledge, theoretical as well as practical.

One word more, and I have done. The highly educated young men from the foreign Polytechnics become masters when they can, but are not ashamed, till then, to act as foremen of manufactories, &c. Now, there is a great reform required in the system, by which foremen and clerks of works are appointed here. The position of clerk of works is a most difficult and responsible one, and should stand higher in the social scale than it does, and be paid better. This will not be the case so long as uneducated mechanics form the staple from which such men are drawn. I look forward to the time when a superior order of men will become the responsible agents, both of the architects and contractors. And this will follow both from the growth of intelligence in the class below them, and the educational supremacy of those above them, a result which the general spread of technical education, as I have endeavoured to define it, must inevitably produce, as "men run to and fro, and knowledge is increased."

#### CORN MILLS.

THE INSTITUTION OF CIVIL ENGINEERS.

At the meeting on the 16th of May, the first paper read was "On the Various Systems of Grinding Wheat, and on the Machines used in Corn Mills," by Mr. W. Proctor Baker.

The author said wheat, originally ground in a pestle and mortar, or between rollers and a hard stone tablet, in both cases by hand-power, was by the Romans, at the time of the Christian era, ground by millstones, and a thousand years ago the millstone did not differ materially from that of the present day. The sifting of the meal, however, seemed to have been done by hand-labour, and the machines by which flour was dressed were products of quite recent times. The Exhibition of Mill Machinery, in 1881, directed attention to the revolution taking place in the art of milling. The Hungarians and Americans had been credited with the possession of processes which the millers of this country were thought to have been slow to adopt, and consequently it was supposed they were in danger of losing their trade. It appeared, however, that these processes were combinations of machinery of recent introduction, but still well-known to British millers, and that they were not adapted to the manufacture, as it was obliged, by circumstances, to be conducted in this country. The flour to be obtained from any given description of wheat was not, as ordinarily supposed, all of one quality, but varied according to its position in the wheat-

kernel. The methods in general use made one flour of average quality from the grain, which was of a description that met a ready sale. The Hungarians and Americans divided and subdivided the qualities from one wheat, the former into as many as ten or twelve different sorts, the latter into a smaller number; and as different markets required different qualities, they were able to find a market for the whole series of qualities, sending each to an appropriate market. But the home miller was obliged to make, for his own local demand, the particular quality which the district required, because the home market was his only market. As a rule, only one quality of flour being required in the district within reach of a mill, the home miller was debarred from using processes whose success depended on finding markets for several qualities, and especially on selling the very fine flours at high prices. The system in general use up to about ten years ago was low grinding, by which it was sought, at one operation, to crush the kernel of the wheat into flour, and at the same time completely divide the flour from the bran. Lately, the tendency had been not to complete the grinding at one operation, but rather to proceed on a system known as "gradual reduction." The reason for the change of practice was, that in low grinding not only was the interior of the grain crushed into minute particles, known as flour, but, at the same time, the bran being brittle, broke, or a portion of it was broken into equally small particles, and these became inextricably mixed up with the flour, and could not be separated from it. The presence of these particles in the flour gave a dark colour to bread made from it. A system based on the Hungarian procedure had come into use in order to avoid this disadvantage. It was sought, while dividing the bran from the interior of the grain, to break up the latter, not into flour, but into fragments of the size of a very small pin's head, known as "semolina," or "middlings." But in doing this, particles of bran were still broken up and mixed with the semolina. The semolina was, however, large enough to be subjected to a winnowing operation, performed by an appropriate machine, called a "purifier"; this separated the branny particles, and left the "semolina" pure, being, in fact, small fragments of the wheat without mixture of bran. The fragments were crushed by roller-mills or millstones to flour, and gave a pure flour free from specks. Not only, however, was it possible thus to separate the bran, but as the semolina varied in density according to its position in the wheat corn, and as that which was most dense gave better flour than the less dense, the semolina itself was graded in quality according to its specific gravity, and each grade being ground separately gave a different quality of flour. Thus, several different qualities of flour were obtained from the same wheat. To get semolina instead of flour, it was necessary to subject the wheat to a cracking rather than to a crushing action in grinding, and for this purpose the grinding had to be accomplished at repeated operations, hence the system was named "gradual reduction." The wheat of commerce delivered to the miller contained all manner of seeds, dirt, stones, nails, and articles inappropriate for flour-making, which it was necessary carefully to remove. A considerable number of machines, performing different functions, had to be provided for the thorough cleansing of the wheat, removing all dust and polishing it, before it was ready to be ground. The grinding, which was formerly accomplished altogether by millstones, was now in some cases entirely, and in other cases at some stages, performed by roller-mills. The use of these was extending. It had been established that the best materials for the roller were chilled cast-iron or porcelain. The former might be used for grinding wheat or semolina, the latter was fit for soft semolinas only. The chilled iron was hard enough and tough enough to bear the severe friction of wheat-grinding without material wear, a friction that porcelain would not stand; but on account of the slight porosity of the surface, porcelain was preferred by some for grinding soft semolina. As considerable pressure was used in grinding semolina, the rollers were apt to heat, and it was found that rollers of about 15 in. in length were the longest that could be usefully employed, while other considerations fixed the diameter at about 9 in. Rollers for grinding semolina had smooth surfaces, and might run at equal or differential speed; rollers for grinding wheat were grooved or fluted, and ran



always at differential speeds. Pressure was applied through the bearings in various ways, by levers, wedges, springs, or screws; but the design of Mechwart, of an anti-friction ring-pressure, afforded the means of applying heavier pressure than any other roller-mill. All other things being equal, the roller-mill which gave the operator the power of putting the greatest pressure on the material to be ground was the best. Another novelty was the centrifugal silk dressing-machine, which consisted of a cylinder slowly revolving, through which the flour was driven by beaters running at a high speed inside it. This machine was almost a necessary accompaniment of the roller-mill, as the meal ground by rollers had a tendency to cake, and the beaters were needed to break up the cakes. But the most important machines of recent introduction were the "Purifiers," which were used for the purpose of purifying and classifying the semolina. These machines worked either on the principle of causing the semolina to pass through a series of passages, where it was exposed to currents of air, which first removed the bran, and then, as it were, weighed the semolina and divided it; or by centrifugal force the semolina was scattered in a shower, and divided in consequence of the heavy particles flying farther than the light ones; or by an arrangement by which the semolina was made to traverse a long sieve, which had a rapid joggling or oscillating motion. In the latter case the motion caused the heavier particles to sink to the surface of the sieve, and the lighter ones to float on the heavier ones. A pressure of air was kept up under the sieve just sufficient to prevent the light particles from falling through the meshes, while the heavier particles which were heavy enough to overcome the air pressure, fell through the sieve and were collected at the bottom of the machine. An exhaust above the sieve carried away the lightest particles, and all but the lightest and the heaviest passed away into a receptacle at the lower end of the sieve. The purifier was of more importance in the modern processes than the roller mill, for the work of the latter might be done by the millstone, while without the purifier neither the millstone nor the roller-mill could make pure or the finest flour. As the taste for whiter bread appeared to be on the increase, an extension of the high-grinding systems might be expected.

The second paper was on "Modern Flour-Milling in England," by Mr. Henry Simon. In this the importance of the flour-milling industry of the United Kingdom was noticed, as much as 2,000,000. per annum being turned over in a single milling establishment in London. Much flour was also imported from Hungary and the United States, especially from the latter country. The quantity of wheat ground in England in one year was more than 25,000,000 quarters, and for the whole of Europe the daily expenditure for cereals to be ground was about 1,500,000. It was stated that flour produced by roller-mills in England was worth 2s. 6d. to 5s. more per quarter than that ground by stones, the wheat being of the same quality.

#### CONVERSAZIONE OF THE INSTITUTION OF CIVIL ENGINEERS.

The President of this institution held a conversation on Thursday evening in last week in the South Kensington Museum, by permission of the Committee of Council on Education. The guests, of whom there were upwards of 2,000, were received by Sir William and Lady Armstrong in the second division of the architectural court, and passing onwards many lingered for awhile in the Lord President's Court, where the Hungarian band played a varied and attractive selection of popular and classical airs. This court was illuminated by the electric light (Brush system), and the scene viewed from either of the galleries was both animated and picturesque. Sir Frederick Leighton's spirit fresco, the mosaic portraits on the walls, the loan collections of works of art, and the numerous examples of Oriental pottery, were brilliantly illuminated and greatly admired by the ladies and gentlemen who thronged the court, the *tout ensemble* presenting a scene of animation not often witnessed in the Museum. In the Italian Court, the chapel on the north side was occupied by the string band of the Royal Engineers, under the leadership of Mr. J. R. Sawerthall, and here also the visitors crowded every avenue, threading their way amongst the

various objects for which this court is famous, and passing through the north and north-west cloisters to the various refreshment-rooms. One of the latter was in the form of a tent of red and white canvas, erected in the quadrangle, and very prettily decorated with a wealth of flowers, ferns, and palms. Many of the guests sought the various rooms appropriated to the national collection of pictures by British artists, and the Raffaele cartoons in the adjoining north gallery; while others roamed amidst the galleries where the Sheepshanks collection is displayed, and listened to the clever pianoforte recitals given by the distinguished Russian pianist, M. Vladimir de Pachmann, all and singular expressing unbounded satisfaction with the entertainment afforded them. The only drawback to the holding of the *conversazione* in the South Kensington Museum is that there is no room for the display of new inventions, models, &c., appertaining to engineering science and construction, which have formed so interesting and instructive a feature of some previous *conversazioni* of the Institution.

#### BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the twelfth meeting of the session, Mrs. Dent, of Sudley Castle, sent a plan of the Roman villa now being excavated in Spoonley Wood, about a mile from the castle. It is a building of large size, a portion of a centre and a long projecting wing being already laid open. A corridor runs around both portions, while several pavements of elaborate design have been found, one being extremely fine. A hypocaust has also been met with. The find promises to be a remarkable one.

Mr. E. Walford described two Roman coins found at Hampstead, pointing to the presence of the Romans in the locality.

The Rev. G. B. Lewis exhibited photographs of the little known tapestries now preserved in Knowle Chapel, having been found in an attic several years ago by Lady Delaware. They are in remarkable preservation. They represent the Passion of our Lord, and were probably brought to Knowle by Archbishop Wareham.

Mr. Gordon M. Hills read a short description of several examples of acoustic pottery found in ancient churches.

Sir Henry Dryden exhibited a photograph of a remarkable chess-man of Norman date, found at Northampton Castle.

The first paper was by Mr. J. Greenstreet, on the Camden Roll of Arms recently found by Mr. W. de Gray Birch, F.S.A., in the British Museum, where it has remained for many years apparently unnoticed. It is the earliest known series of arms, there being 270 shields, and the length of the parchment being 5 ft. 3 in. It was in Camden's possession about A.D. 1605, but it dates from the time of Henry III. or Edward I.

The second paper was by Mr. E. P. Loftus Brock, on the remains now being excavated on the site of the new Stock Exchange. A large mass of Mediaeval walling has been found, of thirteenth and fifteenth century dates, the remains of a mansion of importance. A portion of a Roman pavement and much pottery have also been discovered. The mansion was probably that of John de Wengrave, who had licence to crenellate his dwelling, 7th of Ed. II.

#### FEMALE SCHOOL OF ART.

The annual distribution of prizes to the successful students at this institution took place (as we briefly announced last week) on the 24th ult., in the large hall of the Freemason's Tavern, Sir Philip Cunliffe Owen presiding. Among those on the platform were Mr. Francis Bannock, F.S.A.; Mr. George Godwin, Professor Donaldson, Colonel Britten, Mr. R. P. Spiers, Signor Bulletti, Mr. Thomas Wyatt, Mr. Harding, Mr. Robert Shepard, Mr. T. Chisholm Gooden, Mr. Frederick Latreille, Dr. Ellison, the Rev. Mr. Goe, and Miss Louisa Gann, Superintendent of the school.

Mr. Francis Bannock, the hon. secretary, commenced the proceedings by reading the annual statement, from which it appeared that, during the past year, the school had achieved unusual success, the students having won twelve national awards in competition with all the schools of art, both male and female, in

England, Ireland, and Scotland; and the unprecedented number of ninety third-grade awards of books. During the year 203 students received instruction in the various branches of art-education. On the 9th of April last, 3,135 drawings, paintings, and models, were forwarded to South Kensington from the school, being the works of 157 students, or an average of nearly twenty works for each student. The national awards included silver medals to Miss F. Renson, Miss E. C. Nisbet, and Miss M. E. Carter, for drawings and studies in chalk and water-colours; and several bronze medals for similar work. For the national Gilchrist Scholarship nine of the students competed, one of whom was successful. The scholarship of 40l., founded by the Baroness Burdett-Coutts, was awarded to Miss Crittenden. The school committee acknowledged with thanks the reception of donations from the Corporation of the City of London, and from the late Mr. W. Atkinson, in aid of the fund for augmenting the Queen's scholarship prize to the annual value of 60l. A large proportion of the students who have passed through the institution are reported to have received great benefit from the instruction imparted to them, and many are filling excellent appointments in schools and business firms in London and the provinces. The continued patronage of her Majesty the Queen, who has in various ways contributed to the progress and efficiency of the school during the past twenty years, claimed the warmest gratitude from all friends of the institution.

The prizes were then distributed. The principal were:—Queen's Gold Medal, Mary E. Harding; Queen's Scholarship, Constance Wood; Queen's Prizes, Ethel Nisbet, Kate Richards, and Norah Waugh; Clothworkers' Scholarship of twenty guineas, Mary E. Harding; Gilchrist Scholarship of 50l., Lilian Abraham and Ottilie Amalie Bodé; Baroness Burdett Coutts Scholarships, Dora Crittenden and Lilian Young; National Silver Medals, Mary E. Carter, Ethel Nisbet, and Florence Reason; National Bronze Medals, Lilian Abraham, Edith Harris, Edith Robinson, Norah Waugh, Rose Ethel Welby.

The following prizes were given to pupils in the School of Wood Carving:—Mr. Bennock's Prize, 5l. 5s., to Miss Irvin; Sir John Peter Grant's Prize, 2l. 2s., to Miss Rowe; Committee's Prize, 1l., to Miss Reeks; Committee's Prize, 1l., to Miss Williams.

The Chairman then addressed the company on the position which the Female School of Art had attained. He claimed the privilege of rejoicing at its success because he had always had its best interests at heart, and had done all in his power to help it. The school had successfully overcome the difficulties which beset it twenty years ago, and had since then gone on from success to success. It had an individuality which was peculiar to it, and it had had the invaluable guidance of the Superintendent, Miss Gann, and her assistants, to whose unwearied zeal, intelligence, and tact was due, in the largest manner, the high position which it occupied among the art-schools of the kingdom.

The Rev. F. F. Goe moved, and Mr. J. Chisholm Gordon seconded, a vote of thanks to Sir P. C. Owen for presiding, which was briefly acknowledged.

Mr. George Godwin, in proposing a vote of thanks to the Baroness Burdett-Coutts, the Gilchrist trustees, and the Clothworkers' Company, remarked that among the many friends of the institution none had rendered greater assistance than the Baroness. He regretted that the students had not come forward to compete for the prize which he had offered for cameo-cutting, because he was convinced that it was an occupation for which ladies were specially adapted, and it was a matter for national regret that money should go out of the country to benefit foreign artists when there was plenty of talent at home for which insufficient employment was forthcoming.

Professor Donaldson having seconded the motion, it was carried with applause.\*

**Early German Woodcuts.**—The Exhibition at the Burlington Fine Arts Club this season is a very interesting collection of early German woodcuts of the fifteenth and sixteenth centuries.

\* Will some of our readers take note and act accordingly, that a really good amateur concert in aid of the desired increase of the Queen's Scholarship is to be given at 12, Harley-street on the 15th of June. Between the parts the inimitable George Grossmith will give a new musical entertainment.



### NEW STEAM-BOAT PIERS AT NINE ELMS AND BATTERSEA.

The public will shortly reap the benefit of two additional piers for the up-river traffic, which the London Steam Boat Company are about to construct. The removal of the Nine Elms Pier some time ago, on the action of the London and South-Western Railway Company, has for some time past been felt as a serious public inconvenience. This, however, is about to be remedied by the erection of another pier in the locality, along Messrs. Bryan & Co.'s wharf in Nine Elms-lane, a very short distance from the site of the old pier, and, as we are informed, much less difficult of approach. It may incidentally be observed that in connexion with this Nine Elms Pier question the South Western Railway Company are not unlikely to sustain a Parliamentary defeat in the opposition which they are offering to the South London Tramway Company, who are seeking powers to extend their line along Nine Elms-lane.

### STEAM TRAMS.

The question of the use of steam on tramways has recently occupied the authorities of two large Continental cities, and the result at which they have arrived is diametrically opposite in the two cases. To speak first of Paris. On several tramway lines in that city and its suburbs, steam was in use for from two to five years. On the line starting from the Arc de Triomphe, and proceeding to Courbevoie, locomotives were longest in use, but since the commencement of May steam engines have ceased to run, and have been replaced by horses again. The Paris Tramway Company wished to give steam a thorough trial, and as they have had five years' experience of it, and have tried every system they could find,—the number was no less than twenty-one,—they have every reason to consider that their acquaintance with the merits and defects of steam power is pretty exhaustive. The end has been, as we have intimated, that they have totally abandoned steam and reverted to the old system of employing horses. The result of the prolonged trials has been to show that steam is dearer than horse power. The engine requires a driver and stoker, whose pay is greater than two of the old drivers or coachmen. Then the fuel and maintenance of the engines in order were costly, while the original outlay in capital is about the same as that required to keep up the requisite stud of horses. The only advantage with steam was that on Sundays and holidays, when there was an unusual number of passengers to convey, the steam engine could draw a couple of carriages, each carrying fifty passengers. Against this was to be set the fact that in the broad avenues where the tram-lines are laid down, and where alone it was safe or permissible to employ steam, there are seldom sufficient passengers to fill two carriages, even on Sundays and holidays. Moreover, hardly a week, often not a day in the week, passed without some accident on the steam line, which proved very costly to the company, and led to complaints being addressed from various quarters to the authorities. Hence, the authorities at last issued a prohibition against the further employment of steam, and in this the Company acquiesced with perfect readiness. Among the twenty-one systems of engines tried on the Paris lines, several were propelled by compressed air.

A complete contrast with the failure in Paris is presented by the results of the experiments and the resolutions of the authorities at Hamburg. The United Tramway Company there, after laying down new rails, partly of Dömerbe's and partly Haarmann's patents, have, with the express permission of the police and municipal authorities, just abandoned horses in favour of steam locomotives. It was in September last that the company petitioned to be permitted to make a greater use of steam power in place of horses. Before the concession was granted the authorities instigated a searching investigation into the question. They despatched official engineers to Holland and various places in Germany where steam was in use; they also obtained from the authorities in the various cities in France and Italy where it was employed official accounts of the experiences made in those places, and the materials thus acquired were compared with the experience gathered in Hamburg itself.

The result of the examination was that the Hamburg authorities unhesitatingly granted permission for the extended use of steam there. The only engines permitted to be used, however, were those on the Winterthur system, the reason being that they had been found to be the safest. Since the beginning of March, accordingly, steam has been increasingly used on the Hamburg tramways.

There is only one observation we shall permit ourselves on these two opposite decisions. In the case of Hamburg, the line runs mostly in the suburbs to the neighbouring village of Wandsbeck. Besides the fact that in the German port horses and vehicles in the streets are far less common than in many other cities of the same size, it is obvious that there is far less objection to a steam-engine along a country road than in the streets of a city. Whoever has had a little experience in a large city knows how great a nuisance horses are, and admits the desirability of some safe method of traction which shall enable us to dispense with them in towns. Even if the Paris verdict should be confirmed against the use of steam in crowded streets, still the resources of engineering science are not exhausted, and we hope that there is inventive ingenuity enough left in the world to devise a safe mechanical traction machine applicable to the streets of large cities.

### A CASPIAN AND AZOF CANAL.

A RUSSIAN officer, Colonel Blum, has submitted to his Government a plan for joining the Sea of Azof with the Caspian Sea by means of a canal. As the Caspian is likewise to be connected with the Sea of Aral to the east, there will be a direct route from the Black Sea for trade with Khiva, Bokhara, and the other parts of Central Asia recently conquered by Russia, and those that are still independent. In ancient time, and even as late as the middle of the sixteenth century, the river now called the Amu Daria flowed through the Sea of Aral and discharged itself into the Caspian through a mouth which has subsequently been stopped up with sand. The Sea of Azof is 25 metres and the Sea of Aral is 11 metres higher than the Caspian Sea. If the proposed canal is really carried out on a sufficient scale, it will be long before possible for vessels to steam from the Atlantic into the centre of Asia, and to the very middle of the wilds of Tartary.

### EXTENSIVE NEW BUILDINGS AT MR. SPURGEON'S ORPHANAGE.

In addition to the Girls' Orphanage, forming the south side of the quadrangle of these buildings, which have just been completed and opened, other buildings in connexion with the institution are at present in course of erection. On the south-east side a spacious swimming-bath and play-hall are being built, from the designs of Mr. Wright, architect, of Hayter-road, Brixton, the contractor being Mr. Johnson, of Belle-Vue-road, Wandsworth-common. The building is 122 ft. in length, and uniform in its architectural features with the block forming the Girls' Orphanage, on the south-west side of the quadrangle. It is Gothic in character, faced with red brick, with white Suffolk brick bands and window-heads, and stone three-light mullion windows and copings to the gables surmounting the frontage, of which there are six in number. A range of twelve Gothic windows and entrances are carried across the frontage in the lower part of the elevation, which has an ornamental turret in the centre. Internally, the building is 40 ft. in height from the floor level to the ridge of an open-timber roof. The interior is divided into two parts, of 60 ft. in length each, one portion containing the swimming-bath, which is 50 ft. long, and 20 ft. wide, the depth at the shallowest end being 3 ft., and at the deepest end 4 ft. 6 in. The entire width of the interior is 40 ft., and on the marginal space around the bath there are thirty-four dressing-boxes. The floor of the play-hall, which is for the recreation and amusement of the girls only, is laid with wood diagonally. The cost of the building will be about 3,000l.

Immediately to the north-east of the swimming-bath is the infirmary, which is being considerably enlarged and entirely refaced, so as to present a more ornamental architectural appearance. The frontage, which like the other buildings connected with the institution, are in red and white brick, contains two floors, having

two and three light arched windows, and the elevation is surmounted by a lofty central gable, and four smaller gables, two on each side.

The girls' orphanage, a view of which appeared in the *Builder* when the erection of the structure commenced, has had added to it, since it was opened a few months ago, a handsome covered arcade, which is carried along the building, immediately in front of the entrances, to its entire length of 270 ft. It is 9 ft. in width, and is supported on thirty-two ornamental iron columns. Messrs. Peto Brothers were the contractors for the main building, and Mr. Johnson, of Belle-Vue-road, Wandsworth-common, was the contractor for the arcade.

On the north-west side preparations are at present being made for the erection of an extensive new dining-hall and other buildings in connexion, sufficiently spacious to dine 500 children. The dining-room is intended to be so constructed as to form a large lecture-hall, in which there will be galleries. When this building is completed, the intention is to convert the present dining-room into an orphanage chapel. The estimated cost of the building, including the land, is about 10,000l.

### EXHIBITION OF WORKS IN HORN.

THE Worshipful Company of Horners of London, with a view of encouraging technical education, and following good examples that have been set, have, with the permission of the Lord Mayor, decided to hold an exhibition of articles, ancient and modern, whether British or Foreign, made of horn, or of which horn is a component part, but excluding works in ivory, bone, or tortoiseshell, at the Mansion House, on the 18th, 19th, and 20th of October next. Prizes will be given to exhibitors being members of the trade. We invite, for the Company, the co-operation of members of the trade, gold and silversmiths, and owners of articles of ancient and modern art and utility, in furthering the objects the Company have in view.

Mr. C. H. Compton, Renter Warden of the Company, 19, Great George-street, Westminster, who has largely aided the movement, will give any information that may be required.

**Fires in Theatres.**—As matters stand at present, the inquiry ordered to be made by the Metropolitan Board of Works, stimulated to action by the Home Office, into the respective security against fire of the various metropolitan theatres, is still proceeding; but, as far as is known, no practical steps for carrying out the recommendations made are yet in contemplation. Instead of acting, and acting promptly, theatrical managers appear to be taking to writing protests against official interference. It is to be hoped that some good will ultimately come out of this paper warfare. But as a means of conciliating the respective interests, we may just call the attention of all concerned to the report of a committee of the Austrian Society of Engineers and Architects on the Vienna fire, to which little attention has as yet been directed, and a translation of which was published by the *Builder*. That report unmistakably points out that strong measures are required, and what they consist in. Amongst other very valuable suggestions, it states that the auditorium and stage ought to be treated as two separate buildings. "A party-wall, therefore, which divides the theatre throughout its entire width and height becomes a *sine qua non*, on account of its great importance in the case of fire, forming, in that instance, a complete screen. Beyond the proscenium opening, it should have but few other outlets; the latter, as a matter of course, being shut by iron doors. No connexion whatever ought to be permitted between the attic stories of the stage and the auditorium. Experience teaches us that just in this proscenium opening is hidden the greatest danger for a theatre-going public; and the method of properly shutting it off from the auditorium, or rather the iron curtain itself, forms one of the cardinal points." The matter could not possibly be put in plainer language. The alterations and improvements suggested in the report referred to may involve expenses which, in some cases, are sure to be heavy; but even managers of theatres will admit that human lives are far too precious to be sacrificed to considerations of economy.—*Iron*.



## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 2,244. J. Thallon, London. Floors and treads of stairs. May 12, 1882.
- 2,272. J. M. Hall, London. Stench-traps. May 15, 1882.
- 2,273. C. H. von Ullner, London. Syphonic ventilating chimney-top and wind-guard. May 15, 1882.
- 2,276. A. H. Hearington, London. Apparatus for obtaining light and heat from gas. May 15, 1882.
- 2,302. J. Mitchell, Paris. Manufacture of decorative transparencies for ornamenting windows, &c. (Comp. Spec.) May 16, 1882.
- 2,303. A. M. Clark, London. Apparatus for drying wall-paper. (Com. by J. S. Warren, W. H. Fuller, and J. H. Lange, New York, U.S.A.) (Comp. Spec.) May 16, 1882.
- 2,327. T. H. P. Dennis, Chelmsford. Means of attaching knobs and handles to spindles, &c. May 17, 1882.
- 2,346. G. H. Haywood, London. Overmantels of chimney-pieces. May 18, 1882.
- 2,357. T. W. W. Barrett, London. Apparatus for enabling persons to ascend to the tops of chimney-stacks, &c. May 19, 1882.
- 2,365. W. R. Lake, London. Construction of ceilings. (Com. by J. Budd, Boston, U.S.A.) May 19, 1882.
- 2,377. H. Kelly, London. Gullies. May 20, 1882.
- 2,395. H. Greenhouse, Worcester. Fireplaces. May 22, 1882.
- 2,420. W. S. Morton, Edinburgh. Manufacture of materials for covering and decorating wall-surfaces, &c. May 23, 1882.
- 2,477. J. Smith, Liverpool. Domestic fireplaces. May 25, 1882.
- 2,498. A. M. Clark, London. Door-fasteners. (Com. by C. A. Croughey, Detroit, U.S.A., and G. W. Busch, Walkersville, Canada.) May 25, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

May 16, 1882.

135. F. Holmes, New-cross. Manufacture of fire-lighters, &c. Jan. 10, 1882.
209. T. R. Shelley, Smethwick. Glazing greenhouses, roofs of railway stations, &c. Jan. 14, 1882.
363. W. R. Lake, London. Means for supporting, &c. window sashes. (Com. by P. W. Blythe, Boston, U.S.A.) Jan. 24, 1882.

May 19, 1882.

- 1,410. N. Scott, London. Means of ingress and egress to theatres, halls, &c., in case of fire or panic. March 23, 1882.
- 1,890. F. Kingston, Deptford. Eye for holding stair-carpet and other rods. April 20, 1882.
- 1,920. J. Keith, Edinburgh. Boilers and heating apparatus. April 22, 1882.

May 23, 1882.

283. A. M. Clark, London. Machinery for making trenches for drain-pipes. (Com. by M. E. Pidgeon-Saugteries, U.S.A.) Jan. 19, 1882.
317. J. Holroyd, Leeds. Sanitary trough closets. Jan. 21, 1882.
438. J. Imray, London. Manufacture of decorating papers. (Com. by A. Cottais, Paris.) Jan. 28, 1882.
544. G. Otway, London. Apparatus for cutting or dividing bricks, tiles, or slabs from plastic clay, &c. Feb. 4, 1882.
- 1,388. G. Kent, Portsea. Chimney-tops or ventilators. March 22, 1882.
- 1,902. W. Selley, Manchester. Ash guards for domestic fireplaces. April 21, 1882.
- 2,303. A. M. Clark, London. Apparatus for drying wall-paper. (Com. by J. S. Warren, W. H. Fuller, and J. H. Lange, New York, U.S.A.) May 16, 1882.

May 26, 1882.

925. W. H. Lascelles, London. Earth-closets. Feb. 25, 1882.

## ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending May 20, 1882.

- 4,157. F. Hamilton and F. A. Hamilton, London. Reflectors, &c., of daylight.
- On the under-side of a frame, glazed with glass, are placed silvered reflectors with a glass face, for diffusing the daylight. (Pro. Pro.) Sept 27, 1881. Price 4d.

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

## 4,344. A. W. Calvert, Leeds. Street and other lamps.

Round the bottom are a double row of perforated plates of metal, the inner row having smaller perforations than the outer row, and inside these there is also wire gauze, to still further subdivide the air as it enters. A transparent baffle is also placed round the supply-pipe, to prevent the air approaching the burner in too large a volume. The staves of the lamp are hollow, and allow air to enter through them to the upper part of the lamp. Reflectors are placed outside the top of the lamp. Oct. 6, 1881. Price 6d.

## 4,391. B. W. Spittle, Wednesbury. Attaching door-knobs to their spindles.

A locking washer is slipped over the square spindle, in which is a toothed spring, and the loose knob is screwed on the spindle until a proper adjustment is made and the tooth of the spring engages in one of the slots in the base of the shoulder of the knob. Oct. 10, 1881. Price 4d.

## 4,512. W. A. McCormick, London. Apparatus for regulating the supply of water to closets, &amp;c.

An inner cistern is suspended in a larger one, and on one movement of the lever the inner cistern is inclined, to cause a flush, the supply-valve is shut off, and the discharge-pipe opened. (Pro. Pro.) Oct. 15, 1881. Price 2s.

Published during the Week ending May 27, 1882.

## 4,503. C. Gall, Halifax. Safety appliances and fasteners for windows, &amp;c.

This is made in the form of a dovetail, male and female, one on each sash. On the upper sash is the catch-bolt, bevelled and hollow, and on the lower sash is a plate carrying two pivoted levers, which enter the hollow of the catch-bolt. To form an alarm, the levers are lengthened and carry a hammer, which, when the window is opened, strikes and explodes a cap on an anvil beneath. Oct. 15, 1881. Price 6d.

## 4,511. B. R. Harrington, Beckenham. Air inlets or ventilating gullies for drains.

These gullies are made of earthenware or iron, and are throated or bell-mouthed, and have an outlet at the side which fits on to the rising pipe from the drain. (Pro. Pro.) Oct. 15, 1881. Price 2d.

## 4,526. P. Everett, Great Ryburgh; and A. Barnard, Norwich. Stoves and grates.

The bottom, back, and sides are solid, and passages commencing below the level of the bottom pass round the back, bottom, and sides of the grate and terminate in apertures in the sides and back, a little above the fuel. By these passages heated air is mixed with the products of combustion to consume the smoke. A baffle also is placed above the fire. Oct. 17, 1881. Price 6d.

## 4,551. G. E. Waring, jun., Newport, U.S.A. Water-closets.

The pan has no valve, but a siphon-like outlet rising from the bottom. The longer limb of the siphon enters a trap in which water is retained, but so as to uncover the lower end of the siphon. When water is admitted to fill the siphon, the siphonic action set up empties all the water out of the pan, which is again filled by an after-flow. Oct. 19, 1881. Price 6d.

## 4,557. J. A. Hornby, Menni Bridge. Water-closets.

The valves are so arranged that when the soil-pipe is opened to empty the pan the effluent in communication with the ventilating pipe of the closet-pan is closed, and vice versa. Oct. 19, 1881. Price 6d.

## 4,565. W. M. Farley and J. H. Bond, Torquay. Supplying dwelling-houses, &amp;c., with water.

The same pipe is used both for feeding the house cistern and for draining the water off therefrom. The end of this pipe in the bottom of the cistern is provided with a rising and falling ball or float valve, suitably leaded to prevent it from closing the pipe under the action of the pressure when the supply is turned on. This valve is connected by a chain to a float, which, when the cistern is full, will close the pipe by drawing up the valve. (Pro. Pro.) Oct. 19, 1881. Price 2d.

## 4,566. W. A. Martin, London. Open fire-grates.

A pair of plungers from the sides of the grate, which can be projected forwards towards the centre of the grate, and then be drawn back again, allowing the fresh fuel to be placed at the side of the spent fuel. (Pro. Pro.) Oct. 19, 1881. Price 2d.

## 4,590. F. Worth, Frankfurt. Chimney-flues.

To prevent volatile metallic particles escaping through the chimney-flues of foundries, &c., thin vertical sheets of perforated metal are placed in the bottom of the flues. (Com. by Gesellschaft des Esmer Blei und Silberwerks, Bms, Germany.) Oct. 20, 1881. Price 4d.

## 4,598. G. Pitt, Sutton. Water-closets.

To make closets inodorous the soil-pipe descends into a reservoir filled to the brim with water. The matter remains there, covered with water, until it is removed. (Com. by J. Finck, Baden Baden.) Oct. 20, 1881. Price 6d.

## 4,603. T. E. Clarke, Nailhead. Fire-grates.

The gases of combustion are forced to pass downwards through the fire to the bottom of the grate, where they enter two openings, one on each side of the grate, by which they pass through pipes to the chimney. Oct. 20, 1881. Price 6d.

## 4,609. J. Court, London. Appliances for ventilating, heating, and cooling.

A shaft is formed rising above the top of the building, within which is a flue made of metal pipes for the kitchen or other fire which is constantly burning. The pipes in the shaft become warmed, creating an up-draught. Pipes or channels lead from the various rooms to the shaft. Oct. 21, 1881. Price 2d.

## 4,634. A. M. Clark, London. Composition for use in carpentry, fire-proofing, &amp;c.

This composition consists of Kaolin clay and resinous sawdust, which is prepared with water, pressed in a machine, dried, and subjected to a great heat in a kiln,

when it is ready for use, and can be sawn into plank or boards, &c., and used for building or other purposes instead of wood. (Com. by C. C. Gilman, Eldora, U.S.A.) Oct. 22, 1881. Price 4d.

## THE NEW TOWN BUILDINGS AT READING.

THE new Town-hall, Free Library, Reading-Room, and Museum at Reading were formally opened on Wednesday last by Mr. John Walter, M.P. They will cost, when quite completed, about 60,000l., and have been erected from the designs of Mr. Thomas Lainson, architect, Brighton, by Mr. J. T. Chappell. The new buildings (which adjoin the municipal buildings erected a few years ago from the designs of Mr. Alfred Waterhouse, A.R.A., and of which we gave a view in the *Builder*, volume for 1877, p. 109) include a town-hall, which will comfortably seat 1,500 people, besides a large orchestra, a public library, reading-room, and museum, public offices, fine new schools for science and art classes, school for cookery, &c. The lighting arrangements are similar to those of the House of Commons. In this case, instead of the glass ceiling, the architect has contrived a glass cove all round the hall below the ceiling. Behind this are placed the gas-lights, which, communicating with the external air by means of flues, not only carry off the products of combustion from the gas, but assist in the ventilation of the hall. The ventilation of the new Municipal Buildings, Reading, has been carried out by Messrs. Robert Boyle & Son, of Holborn-viaduct, in a very elaborate manner. For the extraction of the vitiated air in the Great Hall three air-pump ventilators, each 6 ft. in diameter, with 2 ft. shafts, are fixed on the roof and connected with nine ornamental perforated panels in the ceiling by means of hoppers and 14-in. branch pipes. [The supply of air is brought down from the roof level through fourteen flues, 9 in. by 9 in., built in the walls, and delivered into the hall through ornamental cast-iron brackets, ranged along the side and end walls. One of Messrs. Boyle's patent downcast ventilators, 18 in. in diameter, is fitted on top of each of the above flues. The large organ, presented to the town by the Reading Philharmonic Society, consists of 2,238 pipes, and is played through the agency of the pneumatic lever, the wind being supplied by three hydraulic engines. The case was designed by the architect of the hall, Mr. Thomas Lainson, and the organ was built by Messrs. Henry Willis & Sons, of London. A notable feature of the great hall are the balconies or galleries, which project a considerable distance from the walls on cantilevers. There are a number of doors in different parts of the building, so that in case of a panic there would not be the slightest difficulty in emptying the hall in the shortest possible time. The free library is divided by oak and glass screens into three departments—reading-room, reference-room, and general library. The authorities of the West-Street Library (free) have intimated their intention of closing their establishment and handing over the contents, considerably more than 4,000 volumes, to the trustees of the new Free Library. There are also a large and small museum furnished, in which will shortly be placed the conchological collection of the late Mr. Bland, who bequeathed it to the town. The schools of science and art, which are already in occupation, include a school of cookery, chemistry, &c., and also a fine suite of modelling and drawing rooms. Towards the cost of all these works the Corporation gives 10,000l. and the site, and the subscriptions up to the present amount to 27,863l.

## ART IN FINLAND: OPEN COMPETITION.

THE Imperial Senate of Finland, at a recent sitting, decided upon opening to the architects of all countries the competition for designs for a large public edifice to be erected at Helsingfors as a home for the Finnish Society of Arts, and as offices and museum for the Finnish Society of Art Industry. Four prizes are offered of the respective values of 4,000, 1,200, 1,000, and 800 Finnish marks. The competing designs are to be delivered at Helsingfors on or before March 1st, 1883. Plans of the site, together with programme of the details, conditions, &c., to be complied with, may be obtained either from Helsingfors, or through the Russian Consulate. Applications sent to Finland should be addressed to Mr. B. Ahnger, Finance Expedition, Imperial Senate, Helsingfors, Finland.



### PRECAUTIONS AGAINST PANIC IN LONDON THEATRES.

At the meeting of the Metropolitan Board of Works on the 26th ult., the Building Act Committee reported numerous structural alterations which it was recommended should be made in several theatres for providing efficient egress and the prevention of the spread of fire. The theatres to which the recommendations referred were Drury-lane, the Gaiety, and the Adelphi. In the cases of Drury-lane and the Gaiety it was recommended, in addition to other alterations of minor importance, that a proscenium-wall, properly constructed, should be erected between the stage and the auditorium, extending from the foundations of the building to a height of 3 ft. above the roof; that a wall should be built across the proscenium opening under the stage, to separate the auditorium from the cellar; that all the openings in the proscenium-wall should be closed with iron doors fitted without woodwork. In the case of new theatres, it was recommended that the certificates should only be issued upon the buildings being completed in accordance with the requirements of the Board. Mr. Deputy Saunders moved the adoption of the report, which was agreed to. A letter was received stating that the Home Secretary was glad to learn that the Board were taking active measures with regard to the arrangements in theatres in case of fire, and that he hoped no time would be lost in enforcing such regulations as might be necessary.

Mr. Hollingshead, in a letter to the *Daily News*, banters the Metropolitan Board of Works upon what he considers to be the excessive attention that they have bestowed upon his theatre, and observes, with reference to the proscenium wall which the Board requires him to build, that this wall has been built and used for the last fourteen years, although the Board, as he alleges, appears to be unaware of the fact. Captain Shaw, in his report, notices that the proscenium wall is not carried up above the roof, and is not continued below the stage, so as to divide the stage from the audience portion of the house, and it is to this, we presume, the requisition of the Board refers. The practice of dividing the stage from the rest of the house by a brick wall is of comparatively recent introduction, many of the principal theatres, notably Covent Garden and Drury Lane, being built without proscenium walls. The precaution is a very salutary one, and if, in addition, some means could be devised for closing the proscenium opening by a fire-proof shutter or curtain, the security of audiences would be improved.

### HYDE PARK CORNER IMPROVEMENT SCHEME.

SIR.—We notice in your issue of the 6th ult. a description, illustrated by a plan and perspective view, of a scheme for the relief of the traffic at Hyde Park Corner, as proposed by Dr. Churchill.

We think it right to state that that gentleman, having professionally consulted us on the subject, and submitted a plan somewhat similar to that reproduced by you, we pointed out to him the grave objections thereto which occurred to us.

We were especially of opinion that not only would the authorities resist any such interference with a main thoroughfare as would be necessary in order to carry out Dr. Churchill's proposal of commencing an inclined approach to a subway under Piccadilly and Hyde Park Corner, but that objections might also be taken to such a wholesale diversion of all traffic,—vehicular and pedestrian,—upon grounds of public morality.

We therefore (though, as a rule, averse to subways as a means of dealing with stagnated traffic) advised Dr. Churchill that; in our opinion, the most feasible plan of dealing with the vehicular traffic, on the lines he suggested, would be by a subway, constructed as centrally as possible, under Piccadilly, with inclined approaches at both ends,—the one from Knightsbridge commencing opposite the Alexandra Hotel, and within the railings of Hyde Park, thereby utilising an otherwise comparatively useless piece of ground, admirably adapted as an outlet for the heavy traffic without in any way interfering with the main thoroughfare; while, at the other end, we proposed gradually to regain Piccadilly by the Green Park, somewhat as proposed by Dr. Churchill.

Undoubtedly, it appeared to us that a scheme destined to be a boon to the general public, as well as to the frequenters of Hyde Park, would be jeopardised unless objections which we felt that the Board of Works, the local and other authorities, could, and would, raise were removed. We were, therefore, reluctantly compelled to differ with Dr. Churchill as to his proposed approach to the subway from Knightsbridge, and as to the line of subway he had adopted.

However, after frequent interviews, and with Dr. Churchill's full concurrence, we delineated our modifications of his scheme upon a plan similar to that which we now inclose. We do not so much complain that, under the circumstances, Dr. Churchill has not done us the justice of placing our plans side by side with his own; but that in some detail, and by a slight alteration in the perspective view, our ideas appear to have been, as you will see, made use of, and appropriated, without any sort of recognition!

GEORGE WM. USILL,  
Assoc.-M. Inst. C.E.  
JAMES ALSTON CARRIAGE,  
Assoc.-M. Inst. C.E.

### CASES UNDER METROPOLITAN BUILDING ACTS.

#### BAD BRICKS.

At the Clerkenwell Police-court, Jas. Pettigrew, of 62, Drayton Park, Holloway, builder, was summoned under 40 & 41 Vict., cap. 32, sec. 17, by the Metropolitan Board of Works, for that he unlawfully did omit to construct the external back and front of the main part of certain houses above the level of the first-floor joist of good and sound well-burnt bricks in certain houses, being the first, second, third, fourth, and fifth houses eastwards from Drayton Park. Mr. Burton, solicitor, appeared for the Board. The defendant did not appear. Mr. J. G. Turner, the District Surveyor, having proved the bad quality of the bricks, and that the defendant had been convicted on the 30th of March last and fined 5*l.* in respect of each house and costs, Mr. Barstow made an order to pull down the whole of the houses, with costs.

#### BAD CONCRETE.

At the Clerkenwell Police-court, Henry Stoe Slegg, of 131, Devonshire-road, Holloway, builder, was summoned by the Metropolitan Board of Works, under 40 & 41 Vict. cap. 32, sec. 17, for having formed the foundation of two houses in a *cul de sac* out of Drayton Park, on land to the east of the North London Railway, of concrete both insufficient in thickness and improperly composed, contrary to the Board's By-laws and the above Act. Mr. Burton, solicitor, appeared for the Board. Mr. St. Aubyn for the defendant. Mr. J. G. Turner, District Surveyor, having deposed to the above facts, and that the defendant had been previously convicted and fined 20*l.* and costs, Mr. Barstow made an order to remove the whole of the concrete within twenty-eight days, and costs of the application.

### WATER COMPANIES' CHARGES.

#### DODDS V. THE GRAND JUNCTION WATER COMPANY.

In the Queen's Bench Division of the High Court of Justice last week, Mr. Justice Field delivered judgment in this case, which came before their Lordships in a case appealed from by Mr. Dobbs, the inhabitant of a house in Westbourne Park, from a decision of Mr. Cooke, one of the metropolitan police magistrates.

When he was called upon to answer a summons for the non-payment of two quarters' supply of water to his dwelling-house, and which was charged at the rate of 140*l.* as the annual value thereof, the appellant contended that he was only liable for payment in respect of 118*l.* as the net annual value assessed for poor-rates; while the respondents submitted that Mr. Dobbs should be held liable for the amount of water-rates as defined under the special Acts of the company from the 7th Geo. IV., cap. 40, section 27, under which water companies were bound to supply a sufficient quantity to inhabitants of private dwellings at certain rates.

After a careful review of the circumstances of the case, his Lordship said that the Court was of opinion that the basis of the clause for water-rates was on the net rateable value, and not on the gross estimated rental, and for these reasons they held that the order of the magistrate could not be supported, and that the appellant was entitled to judgment.

### THE EMPLOYERS' LIABILITY ACT.

#### RIGHT OF WORKMEN TO CONTRACT THEMSELVES OUT OF IT.

##### GRAIFFITHS V. LORD DUDLEY.

This case, which raised a question of great importance (and which was mentioned in the *Builder* a fortnight ago, on the occasion of the County Court judge's decision), has now been brought into the Queen's Bench Division of the High Court of Justice, before Mr. Justice Grove and Mr. Justice North.

The matter arose out of the following circumstances. Lord Dudley employed in his collieries 8,000 or 9,000 persons, and among them had been a man named Griffiths, who was killed, and whose widow the plaintiff was. She sued in the county court, and recovered a verdict in respect of his death for 150*l.*, and it was admitted for the defendant that she would have been entitled to this verdict but for the existence of a special contract between the master and the servant. In connexion with Lord Dudley's collieries there was a colliery club, to which his lordship subscribed 2,000*l.* or 3,000*l.* a year, and of which each person employed was a member. One of the terms of the employment was that every person so employed undertook for himself and his representatives to look to the funds of the said society alone for compensation in the case of injury in the course of that employment, whether resulting in death or not. The contention for Lord Dudley was that this clause freed him from any claim under the Employers' Liability Act, but the County-court judge decided that, even assuming that a workman might contract himself out of the Act, yet he could not contract to deprive his widow or other personal representative of the benefit of the statute. He further expressed his opinion that as Lord Dudley did not bind himself to pay his contribution to the society, the supposed contract was void for want of consideration; and, beyond this, he held that it would be against public policy to allow any persons whatsoever to contract themselves out of the Act. It was now submitted to their Lordships that the County-court judge was not warranted in coming to these conclusions; and a rule was asked for to show cause why there should not be judgment for the defendant, or a new trial. Rule granted.

### IMPORTANT TO ARCHITECTS AND CONTRACTORS.

At the Nottingham County-court, on Wednesday last, May 24th, a case was heard of considerable importance to architects, builders, and contractors. Mr. Sidney R. Stevenson, architect, of Nottingham, sued Mr. Thomas A. Stevenson, a local physician, for the sum of 33*l.* 12*s.* the balance of an account owing for professional services rendered. The plaintiff was represented by Mr. Weightman (barrister), and Mr. Stanger, barrister, appeared for the defendant.

The evidence for the plaintiff showed that the defendant instructed him to prepare plans for the erection of a house in the "aesthetic" style. This he did, and the tender of Messrs. Ellis, well-known contractors, was accepted for the carrying out of the plans. The plaintiff informed the defendant that a clerk of the works must be engaged, but he refused to sanction this, thinking it was not necessary. It was thereupon explained to him that an architect was not expected to visit the place where the building was going on more than two or three times a week, and that it was the duty of the clerk of the works to superintend the minor details. He, however, promised to do what he could. The building was completed, and the plaintiff's commission amounted to 133*l.* 12*s.* The defendant, however, paid 90*l.* of this amount. The plaintiff was cross-examined to show that the work was not properly done, that the drains were defective, and that the house in consequence was unhealthy. It was contended that these were details which could not possibly come under the notice of the plaintiff in his capacity as architect, but that the difficulty should have been obviated by the employment of a clerk of the works.

His honour said that these were clearly the duties of a clerk of the works. If, however, the defendant did not choose to engage one he must take the consequences. An architect could not be expected to be present to superintend these details. The architect could not be held to be responsible.

After this intimation an attempt was made to settle the case privately, and eventually a verdict for the plaintiff for 25*l.* and costs was agreed upon.

His honour said a clerk of works could not be considered merely as an ornamental appendage, for, as matter of fact, the duties which he was usually expected to perform were of a very important character.

**Dowgate Dock.**—The restoration of that part of Dowgate Dock which was destroyed by the recent conflagration is now complete. The work has been carried out by Messrs. Clarke & Bracey under the superintendence of Mr. Robert Willey, architect.



## CHURCH-BUILDING NEWS.

**Warmwell (near Weymouth).**—The small parish church of this Dorsetshire hamlet has long been in need of restoration. The church consists of nave, chancel, and western tower. The chancel is now in course of completion after restoration, or rather re-building, at the sole expense of the vicar, the Rev. E. Pickard-Cambridge. The execution of the work has been effected from the designs of Mr. Robert C. Bennett, architect, Weymouth. The main features of the ancient fabric were Early English, and the same style has been maintained throughout the new chancel. The walls are built of the soft local Eivan found in the district, while the dressings are of Box-ground. The eastern window, a triple-light one, is filled with painted glass, a memorial to a lady relative of the vicar's. The contractor for the general works is Mr. G. J. G. Gregory, builder, of Dorchester. The sculpture and the carving generally are by Mr. Harry Hems. Mr. Cambridge, we are told, has been his own clerk of the works, yea, he has acted throughout the job as master-mason too. Every stone in the edifice the vicar has set with his own hands.

**Llangum (Pembrokeshire).**—The Archdeacon of St. David's re-opened this church on the 4th ult., after restoration by Messrs. Balcombe & Prie, of Pembroke Dock, under the superintendence of the architect, Mr. E. H. Lingen-Barker, of Hereford. This is one of the largest of country parish churches. It is cruciform in plan, the north transept containing some interesting fifteenth-century stone-work, including some recumbent effigies. The restoration includes new pitch-pine open boarded roofs, floors, seats, and doors, and stone windows, copings, and crosses. A new stone bell-turret supplants the previous brick one; a retaining wall has been carried round the whole of the north side, where the churchyard is nearly level with the caves; a south porch has been added; and a vestry has been added to the south transept. New choir-stalls, reading-desk, communion-table, and lectern have been furnished, and a Bath stone and Devonshire marble pulpit (erected by Dr. Beaton to the memory of his wife, who was a daughter of the present rector), a white marble angel in the attitude of resignation supporting the book-slab.

**Handsworth.**—The parish church of Handsworth is one of the most interesting places of its kind in the neighbourhood of Birmingham, for in it are deposited the bodies of the three men who made the name of the Soho Works famous,—Matthew Boulton, James Watt, and William Murdoch, the inventor of coal-gas. The seated statue of Watt, one of the finest works of Chanzy, has a separate chapel to itself, built under the direction of the sculptor, who has been careful to arrange the light upon his work in a manner worthy the consideration of those who may desire to see interior sculpture lighted to the best advantage. For a long period the church was much neglected, having been patched from time to time in a strange manner. But four or five years ago the present rector,—the Rev. Wm. Randall,—made an appeal for funds, and the place was then restored and extended in a manner worthy of its associations. But the funds ran short before the whole of the interior decorative work was finished. During the last few months, however, this also has been taken in hand, and is now completed. The carvings and sculpture were entrusted to Mr. J. Roddis, of Birmingham, and Messrs. Harrison & Grylls, of London, have filled the great west window with stained glass.

**Bakewell.**—The restoration of the chancel of Bakewell Church, Derbyshire, has just been completed. The work has been done principally at the expense of the Ven. Archdeacon Balston, vicar of the parish, the outside walls only having been done at the expense of the Ecclesiastical Commissioners. The works include a carved wood-screen under the chancel-arch, the lower part being in accordance with the screen of the Vernon Chapel, in the Newark or south transept. A coved canopy springs eastward from the top of the screen, and surmounted by a double brattice on the east and west sides, runs across from side to side of the chancel. On both hands are stalls with "Miserere" seats, richly and quietly carved. The walls of the chancel are enriched with colour; in the lower part the prevailing tone is green with golden crowns upon it. Above is a different pattern in red. Towards the top the letters I.H.S., surrounded by a crown, are placed at intervals on the wall, between the windows on the

north and south sides are the four evangelists, represented by their usual symbols,—the man, the lion, the ox, and the eagle. In the sides of the windows are drawn sprigs of flowers, or single flowers. The reredos, which stands about 4 ft. from the east wall, consists of a marble base, on which the holy table stands; above rises a plain slab of alabaster, upon which a richly-carved piece of white alabaster, containing in twelve niches the twelve apostles. Above this rises an elaborate specimen of wood carving in oak, which forms a kind of frame to a panel in lime wood, on which is engraved "The scene on Mount Calvary." The architect employed in the execution of the whole is Mr. G. Gilbert Scott.

**Wolborough.**—In connexion with the opening-out of the tower arch, a new tower-screen has just been erected in the parish church of St. Mary, at Wolborough, half a mile from the town of Newton Abbot, Devon. It has been designed in character with the surroundings, by Messrs. Rowell & Son, architects, of Newton Abbot. Wolborough Church, in the main, is a Perpendicular Gothic building, and its old carved oak roof, parclose screens, and enclosed chapels are one of the glories of the neighbourhood. The tower arch shows evidences of being early thirteenth-century work. Under Mr. Rowell's immediate direction, this has now been opened out, and the stones denuded of the layers of stucco and coats of paint under which they have for so many generations lain hid. The walls have been pointed, and left other wise bare. The screen consists of a continuous arcade of twelve bays, surmounted by a moulded cornice, in the main hollow of which are carved paterae. The lower parts, to a height of 4 ft., are panelled. Above are uprights, with mullions between. They are carried up to some altitude, and from them spring continuous pierced tracery, ornamented by carved panels. All the tracery-heads are cinquefoiled. There are double doors in the central part of the screen, and these work upon Smith's patent double-action wing-hinges. The screen is erected in memory of Mrs. Emily Elizabeth Gye, and the work has been carried out by Mr. Harry Hems.

## DISSENTING CHURCH-BUILDING NEWS.

**Newcastle-on-Tyne.**—The foundation-stone of a new Free Methodist Chapel has been laid. Messrs. Oliver & Leeson are the architects.

**Haaton (Newcastle-on-Tyne).**—A new Congregational Church for this district has been opened. The schoolroom is now in course of construction, but the tower and spire are to remain unfinished. Messrs. Oliver & Leeson are the architects.

**Elton.**—A new Wesleyan Methodist Chapel has been opened at Elton. The building is of brick, with stone and terra-cotta dressings; it measures 38 ft. by 64 ft., with three classrooms on one end and a rostrum at the other, and will seat 350 people, including gallery. The contractor was Mr. John Tieline, of Bury, and the architects were Messrs. Maxwell & Tuke, of Manchester.

**Mossley, near Manchester.**—The foundation stones of a new Primitive Methodist School Chapel were laid on the 13th ult. in Wagor-road, Mossley. The new building is to serve the purposes of both a Sunday-school and preaching-room. The estimated cost is about 700l., towards which the friends have already raised upwards of 200l. The contract for the whole of the work has been let to Mr. Ralph Whitlee, of Barnes-green, Manchester.

## PROVINCIAL NEWS.

**Crewe.**—A large new foundry at the Crewe works of the London and North-Western Railway, and said to be the finest building of the kind in the world, was opened on the 13th ult., by Mr. Richard Moon, chairman of the London and North-Western Railway Company. Addressing the assemblage afterwards, Mr. Moon alluded to the extension of their railway works, and to the great improvement which had been made in the construction of locomotive engines by their successive engineers. He directed attention to the 2544th locomotive for the London and North-Western Railway, which had been completed that morning. The Duke of Sutherland, in proposing "Success to the Town of Crewe," responded to its rapid rise and development, and said that if it continued to grow during the next thirty years in the same proportion, it would be

"five times as large as Chester." The whole of the workmen and their wives were entertained to tea by the directors of the railway company, and in the evening a promenade concert and ball were given.

**Wolverhampton.**—At a recent meeting of the Wolverhampton Town Council, Alderman John Jones stated that the anonymous donor who had offered to pay for the erection of an art gallery had for that purpose paid 5,000l. into the bank to the credit of the trustees, viz., Sir Rap rt Kettle, the Rev. J. T. Jeffercock, and himself. It had been decided to offer a premium of 200l. for the designer of the best plan, and 20l. for the unsuccessful competitors. The consent of Government had been obtained to the appropriation of land in Lichfield-street as a site for the gallery.

**Plymouth.**—At a late meeting of the Plymouth Town Council, Mr. Morrish moved the adoption of the committee's report, recommending that the reconstruction of the market on the southern side of the proposed new road from Cornwall-street to Ebrington-street be dealt with as soon as the necessary funds can be obtained, that the work be carried out in sections, and that Block A in the design of "Ye Chape," submitted on the said road, be forthwith proceeded with. Mr. Sanders Stevens seconded the resolution, which was carried. After a great deal of discussion on a proposal that Smeaton's Eddystone light-house be allowed to remain *in situ*, instead of removing it and re-erecting it on the Hoe (owing to the limited space available on the latter), the Council has confirmed the grant of a site on the Hoe, but has appointed a committee of nine members to consider what arrangements should be made between the Council and the Eddystone Committee in connexion with the proposed erection, and to report thereon, the sanction of the Council to any particular site being withheld until the report is presented.

## Books.

*Our Factories, Workshops, and Warehouses: their Sanitary and Fire-resisting Arrangements.* By B. H. THWAITE, C.E. E. & F. N. Spon, London and New York. 1882.

This is a most useful and sensible, and, we may add, a very interesting book. The author takes a comprehensive survey of the risks to which those large numbers of people who work in our factories are subject from defective ventilation, defective sanitary arrangements, mismanagement of machinery, and from fire, and states in a short and comprehensive manner, elucidated by numerous small diagrams, his idea of the methods to be observed in fighting against these various sources of danger. No section of our population, not even seamen, are exposed to more numerous and constant dangers than factory "hands," if we take with dangers to health those to life and limb by accidents; and a perusal of Mr. Thwaite's book, even by those who have no official concern with the subject, would open the eyes of many who are not conversant with such matters to the amount of risk which is or may be daily incurred in the course of manufacture on a large scale. Many persons would be surprised, for instance, to learn how much difficulty and risk attends the apparently simple matter of adjusting and shifting belts on machinery in motion, and what frightful accidents may happen from apparently the most trifling origin in these matters. Accidents with machinery are rendered, in many cases, more terrible and more difficult to check from the connexion of the subsidiary machines with a main driving-engine in a separate and sometimes distant room, with the driver of which no immediate communication can be made. Mr. Thwaite strongly urges that all local machinery should be so constructed as to be capable of immediate disconnection from "the power," on the spot, which is only a question of some increased initial expense. In this and other matters for the safety and welfare of factory hands he is very advanced in his views, urging the advisability of bath-rooms on the establishment, with, perhaps, a small charge, so as to give the hands the opportunity, if they like, of going home clean; and, at least, the provision of ample lavatory accommodation and encouragement to the frequent use of it, which, as he says, has its effect on the *morale* as well as on the health of the workers. We hope Mr. Thwaite's book will be largely read by those who are responsible for the health and safety



of factory hands; and many who are not so will find information in it that is both useful and interesting.

**A Manual of Sculpture: Egyptian, Assyrian, Greek, Roman.** With 160 illustrations, a Map of ancient Greece, and chronological List of ancient Sculptors and their Works. By GEORGE REEDFORD, F.R.C.S. London: Sampson Low & Co. 1882.

Books on ancient sculpture seem to be in demand, for this is the third or fourth we have had before us recently. It is one of the series of illustrated handbooks of art history of which we have noticed some others (on architecture, painting, &c.); and which were put forth at first, or so we understood, as being under the general editorship of Mr. Poynter, though this claim seems to be dropped now,—at all events, in the case of this volume. Mr. Redford regards his subject as having two main divisions,—the archaeological or historical, and the artistic; the former he has intentionally kept on one side, devoted his limited space chiefly to the artistic aspect of sculpture. The book is divided into "technic," "aesthetic," and "historic and descriptive" sections, and a fourth section giving "examples." The illustrations are very numerous, though not in a very high style of execution, which could hardly be expected in relation to the price of the book; as long as they are merely illustrative of facts they serve the purpose well enough, but in the latter part of the book the examples, as in the case of the Venus of the Capitol, are too slight and coarse in execution to convey the effect intended, and accurate outlines would have been better. This may be observed in referring to the engraving of the Niobe figure, p. 247, one of the larger illustrations, in which no attempt has been made to do more than outline the head, limbs, and folds of the drapery, and this illustration is satisfactory as far as it goes, not attempting more than an accurate representation of the general form. Shaded engravings of sculpture should be very well and delicately done to be worth anything; where this cannot be afforded, outline is better. A chronological list of ancient sculptures and their works adds value to the small volume, and in the remarks on examples of ancient statues it is clearly pointed out which portions are genuine and which are restored; a matter in regard to which even those who are not novices in the subject require a reminder sometimes. The book, as a whole, is well done, and gives a well-arranged and readable outline of the subject.

**The History of Dorchester, Oxfordshire: British Earthworks—Roman Camp—Bishopric; and the Architectural History of the Church.** Compiled from the best authorities, with a general introduction, by JOHN HENRY PARKER, C.B., &c. Parker & Co., Oxford and London. 1882.

THIS is, in the main, a republication, under Mr. Parker's superintendence, of all the available published information in regard to Dorchester. The main motive for this, as stated by Mr. Parker in his "advertisement" or preface, is that there is shortly to be a Professor of Archaeology appointed at Oxford, and the whole of the Ashmolean Museum is in future to be given up for that subject. "But archaeology is a very comprehensive term; there are many branches of it, and we may hope that neither heraldry nor architectural history will be overlooked; and for these there is no better field than Dorchester, as supplementary to Oxford itself, which abounds in fine examples of each period, but as it happens fewer of the thirteenth century than any other; and this is just the period in which Dorchester Abbey Church is most important." Accordingly, Mr. Parker has continued in this volume a short resumé of the archaeology of Dorchester, in the way of an Introduction; Mr. James Parker's lecture on the Earthworks in 1863; "A Short Account of Dorchester," by the Rev. W. G. Macfarlane; a paper, by Mr. E. A. Freeman, on the Church; a lecture on it, by Mr. James Parker, in 1874; and the Rev. H. Addington's "Account of the Abbey Church," re-issued by Mr. Macfarlane. This latter essay is well illustrated by engravings of details of the church, and the book is also illustrated by restored plans of the site under Roman occupation, and Mr. Freeman's restored plan of the church. The whole makes a very useful text-book of the archaeology of a special district, perhaps the more useful as it

impartially sets forth the somewhat different views of different archaeologists, and gives some scope for the student to exercise his mind in deciding between the claims of various theories. The idea of collecting in one book the various essays of importance on the archaeology of one place is a rather new, and may prove a very useful one, worthy of being repeated in other instances.

**Lectures on the Science and Art of Sanitary Plumbing.** By S. STEVENS HALLIYER. B.T. Batsford, 52, High Holborn. 1882.

MR. HALLIYER, we are glad to see, has published the course of lectures on sanitary plumbing which he delivered last year at the Society of Arts. They form a neat, readable, little book, well illustrated, and ought to have, and no doubt will have, a wide circulation.

#### VARIORUM.

"A TOUR Round the World," by Albert Smith (Infield, Fleet-street), advertised in our columns, is the genuine relation of a working man who went through Australia, Honolulu, across America from San Francisco to New York. It gives a better idea to working men who think of trying what they can do in the colonies than many larger and more scholarly books.—By a coincidence, the next little book close to our hand, "How to Live on Nothing" (Chapman & Hall), is by the widow of Arthur Smith, brother of the late Albert Smith, and now M<sup>rs</sup>. Bouchard. The lady appears to have had losses, and to have been forced to live economically, and she now desires to give others the benefit of her experience. Live on nothing people cannot, but they can live on much less than is supposed, if they know the way.—The June number of the *Nineteenth Century* includes a paper on the Tower of London, by Mr. Algernon B. Mitford, the principal object of which appears to be to advocate some further proposed restorations there, although what those restorations, removals, and rebuildings are really to be, no one has yet told the public. Perhaps some one will be so good as to let us know.—Those persons who have had their attention particularly directed to Shakspeare's "Romeo and Juliet" by Mr. Irving's revival of that play, will be interested in the subject of an article which will appear in the June number of the *Antiquary*. The original poem from which Shakspeare took his plot and most of his characters is analysed, and the parallel passages are set forth in this article.

#### Miscellanea.

**Shelley Theatre, Chelsea Embankment.**

THIS compact and well-appointed little theatre, which has been erected in Tite-street, by Sir Percy F. Shelley, for the delectation of his friends, and may occasionally be hired by others having a like end in view, was filled with a brilliant audience on the night of the 28th ult., gathered together on the invitation of Mrs. George Medley. The pieces chosen were "Dearest Mamma," by Walter Gordon, and Planché's evergreen "Loan of a Lover," both of which were exceedingly well played. A family sorrow, at the last moment, prevented the appearance of the amateur who was to have filled the part of *Broussier* in the first piece, but the difficulty was overcome by the enlistment of Mr. Horace Wigan, who played the part with the dry quaint humor peculiar to him. The honours of the night were carried off by Miss Annie Selous, whose *Gertrude*, both as regards acting and singing, was delightful. Little less should be said of the graceful acting of her sister, Miss Millie Selous, in both pieces. Mr. Alfred Dever is as good a *Peter Spyk* as can be found upon the stage. The theatre would seem to hold about 250 persons.

**Proposed Memorial to the late Canon Pearson.**—At a meeting held in the Jerusalem Chamber, Westminster, under the presidency of the Dean, it was resolved, on the motion of Lord Coleridge, Lord Chief Justice of England,—"That a memorial of Hugh Pearson, in the form of a recumbent figure, be placed in Sonning Church, under the sculptured arch between the vestry and the sanctuary." An executive committee was named to select an artist, and to superintend the carrying out of the projected memorial, which, it is estimated, may be achieved at a cost not exceeding 1,000*l*.

#### Alleged Manslaughter by a Surveyor.

At the Central Criminal Court, on the 26th ult., before Mr. Justice Lopes, Mr. William Oakley, a surveyor, surrendered to his recognisances to take his trial upon an indictment charging him with the manslaughter of Edwin George Prosser. The defendant pleaded "Not guilty." Mr. Tickell conducted the prosecution, and in opening the case said it was alleged, on the part of the prosecution, which was founded upon the coroner's inquisition and upon a true bill which had been found by the grand jury, that the death of the deceased was brought about in consequence of alleged gross negligence and carelessness on the part of Mr. Oakley. The defendant was a member of the firm of Messrs. Smith, Son, & Oakley, of Waterloo-place. He had the control and management of the Earl of St. Germans' estates, including one adjacent to the Shooter's-hill-road. On Saturday, April the 29th, there was a furious gale, which did immense damage to trees in the country. At about five o'clock in the evening, when the storm was at its height, Prosser was driving past the estate in a trap. Blown down by the wind, a tree upon the estate fell upon the vehicle and killed the deceased. The accusation against the defendant was that he was negligent in not ascertaining that the tree was in an insecure state. The defendant's attention had, it was stated, twice been called to it, but he then considered it safe. At the conclusion of Mr. Tickell's statement, Mr. Justice Lopes remarked that he presumed the learned counsel had put the case for the prosecution at the highest, and he asked him how he defined the criminal negligence which was alleged against the defendant. Mere actionable negligence would not do. He would not express any opinion as to what the result of an action under Lord Campbell's Act might be, but he should be bound to express an opinion as to what criminal negligence was. Did not this case, putting it at its highest, amount to a mere error of judgment? The evil consequences would not have resulted if it had not been for the unprecedented gale of wind. Mr. Tickell said he believed Mr. Oakley formed a *bona-fide* opinion as to the state of the tree. Mr. Justice Lopes intimated that he was of opinion that there had been no criminal negligence on the part of the defendant. The jury then formally acquitted Mr. Oakley.

**The Church Congress.**—The Exhibition of Ecclesiastical Art, which has for so many years formed an interesting adjunct to the Church Congress, will be organised this year on a somewhat extended scale. It will be held concurrently with the Church Congress, at Derby, in the Skating Rink, which will be specially decorated and arranged, from October 2 to the 7th. Many of the leading church furnishers, embroiderers, silversmiths, and glass-stainers have already promised to contribute specimens of their workmanship, and from the central position which the town of Derby occupies it is expected that a very large collection will be brought together. Educational books and appliances will also be included.

**Art Exhibition at High Wycombe.**—On Saturday last Lord Carrington opened a loan picture exhibition promoted by the Literary and Scientific Institute of High Wycombe. The exhibition, which remains open until this Saturday, the 3rd inst., is a large and valuable one, nearly 700 oil paintings, water-colour drawings, and miniatures being on view. Examples of Salvator Rosa, Vandyck, Canaletto, Ostade, Poussin, Van der Velde, Correggio, Holbein, Wouvermans, Carlo Dolce, Rubens, Paul Potter, and other old masters are on view, while among modern artists Gainsborough, Birket Foster, Alma Tadema, Marcus Stone, Briton Rivière, Burgess, Brett, Strandwick, Ansell, Copley Fielding, W. Hunt, Morland, Faed, Landseer, and many others are represented. The pictures have been lent by noblemen and gentlemen in the neighbourhood.

**The Warley Mount Estate, Brentwood.**—The development of this estate, which is undoubtedly one of the finest building sites in the neighbourhood, promises to have a considerable influence upon the future of Brentwood. It is stated that there is a growing demand for villas, residences of good character in the locality. Some portion of the estate has been sold, and building has commenced. A second portion is to be sold by auction by Messrs. Ventom, Bull, & Cooper, on Thursday next, June 8th, and, in view of this, extensive works are being carried out in the construction of roads.



**Control over Apprentices in the City of London.**—It is rumoured that the Bill proposed by the Government for the reform and consolidation of the municipal management of London will contain a clause involving the abolition of the Chamberlain's Court of London, which has existed for centuries, and has exerted jurisdiction exclusively over City apprentices, who are bound to trades under indentures peculiar to the Corporation. It appears that there are at present 3,000 of these apprentices, and when any of them are guilty of "idle, insubordinate, wasteful, or immoral conduct," they are brought before the City Chamberlain, who has power to reprimand them or send them for a short period to Bridewell, in New Bridge-street, Blackfriars. A memorial, very influentially signed by City traders, and headed by the Queen's printers (Messrs. Eyre & Spottiswoode), has just been forwarded to the Home Secretary, protesting against any interference with this ancient and peculiar tribunal. The memorialists allege that it affords a cheap, efficient, and prompt method of dealing with apprentices, and obviates the necessity of employers having recourse to the criminal courts, where the lads are too often contaminated for life. They further assert that the abolition of the court would diminish the supply of skilled labour in the City.

**The Manchester Society of Architects** offers the following prizes to be competed for by such draughtsmen as may be eligible, and by students serving their apprenticeship in the offices of architects in Manchester, or in the offices of any member of the society:—The Society prize of the value of 5 guineas, open to all draughtsmen or students who are under the age of twenty-five years at the date of the issue of these instructions; and Mr. James P. Holden's prize, of the value of 5 guineas, open to all draughtsmen and students who are under the age of twenty-five years at the date of issue of these instructions.

**Surveyors under the Public Health Act.**—Mr. John Myatt has been appointed surveyor to the Leek Improvement Commissioners and urban sanitary authority, Staffordshire, at 150*l.* per annum, vice Frost resigned; Mr. W. Cloutman has been appointed surveyor to the St. George local board and urban sanitary authority, near Bristol, at 100*l.* per annum, vice Dawson, appointed to the Leyton (Essex) local board and urban sanitary authority; and Mr. John Millington has been appointed surveyor, collector, and inspector of nuisances to the Wirksworth local board and urban sanitary authority, Derbyshire, at 100*l.* per annum, vice Webster, resigned.

**Proposed Thames Subway between Greenwich and Millwall.**—All opposition to the Bill which seeks to revive the powers sanctioned by Parliament in 1877 authorising the construction of a subway under the Thames between Greenwich and Millwall, has been withdrawn. The Bill will therefore, in the ordinary course, pass its remaining stages unopposed through the House of Commons, having already gone through the House of Lords. The time granted for the completion of the subway will expire in June, 1885.

**The Proposed Electric Railway under the Thames.**—The Charing-cross and Waterloo Electric Railway Bill, which passed unopposed through the House of Commons, has been stopped in its passage through the House of Lords, the examiners having reported that the standing order of the House applicable to this Bill has not been complied with. The Bill has, therefore, been referred to the Standing Orders Committee, which meets this Friday, the 2nd of June, for them to decide whether the Bill should be allowed to proceed.

**Hawthshaw (Lancashire).**—The foundations and boundary-wall of the new church at Hawthshaw, near Bolton, are now completed. The building is to be in the Early English style, 96 ft. long and 46 ft. broad, in one bay, no pillars being used. The estimated cost, without the tower, is 3,000*l.* The contractor is Mr. Chas. Lomas, of Somerset, and the architects, Messrs. Maxwell & Tuke, of Manchester.

**Sanitary Assurance.**—A public meeting is to be held at the Society of Arts, Adelphi, on Monday evening, June 12, under the auspices of the Sanitary Assurance Association, of 5, Argyll-place, when Sir Joseph Fyler, F.R.S., will preside, and Mr. H. Rutherford, Barrister-at-law, will deliver an address on "Sanitary Assurance from a Householder's Point of View." The admission to the meeting is to be free.

**"Great Paul."**—The big bell for St. Paul's has been safely hauled up to his place. The work was performed during Tuesday and Wednesday last. At about half an hour after noon on Wednesday, the bell had been got up to a position a little higher than that which he is intended to occupy. Later in the day, the headstock was hoisted above the bell, preparatory to its being lowered and fastened upon the cannons. It only remains now to attach the head stock and to seat the gudgeons on the bell-cage; and on this Saturday, the 3rd, the solemn voice of "Great Paul" may be expected to be heard. When swung, the edges of the bell will be about 18 in. below the centre of the clock-face, the bell occupying the northern half of the chamber and the clock-works the half on the south side. About 20 ft. above the headstock of Great Paul hangs the old big bell, on which the clock, by means of a hammer, strikes five hours. This bell, which weighs about five tons, is 6 ft. 10 in. in diameter at the edges, and has a sound-bow 6 in. thick, looks very small by comparison with Great Paul, who weighs over 16 tons 14 cwt., is 9 ft. 6 in. in diameter at the base, and has a sound-bow 8½ in. in thickness.

**New Offices for the South Hornsey Local Board.**—A new building devoted to this purpose has been completed in Milton-road, South Hornsey. It has been erected from the designs and under the personal supervision of Mr. E. Fry, the surveyor of the Board. The character of the buildings is described by the *Hackney and Kingsland Gazette* as "thoroughly composite. The visitor will find nearly all the orders and styles represented. The exterior is Composite and Ionic, the ground-floor and hall and staircase are Doric, the Board-room is Corinthian, and so forth. The combinations and changes make a pretty and striking effect."

**New Municipal Buildings, Great Yarmouth.**—On Wednesday last H.R.H. the Prince of Wales inaugurated the new municipal buildings at Yarmouth, which have been erected from the designs of Mr. J. B. Pearce, architect, Norwich. In our volume for 1879 (pp. 205-8) we published a view, plans of ground and first floors, and a description of the buildings, of which we will say more next week. We may here, however, mention that the roofs are covered with Ashton & Green's admirable permanent green slates, as supplied by them to the new Royal Courts of Justice.

**Engineering on Tyne-side.**—The engineering industry of Newcastle-on-Tyne is largely developing, and we learn from a local paper that Messrs. R. & W. Hawthorn contemplate removing the whole of their marine works to St. Peter's. Extensive alterations and additions have already been made to their works there, and they have lately concluded a contract with Mr. Walter Scott, of Newcastle, for further considerable additions, the plans for which have been prepared by Mr. Wm. Glover, architect, of the same city.

**Shelley's Italian Home.**—Mr. G. Barnett Smith, writing to the *Times*, says he hears that Shelley's Italian home is in danger. A road is contemplated between Sant Erenzo and Lerici, and, if it should be constructed, in all probability it will only be the prelude to the dismantling of the Villa Maecanari, which possesses so much attraction for Englishmen. If at all possible, the demolition of Shelley's house should be averted.

**Free Libraries.**—The Birmingham Central Free Libraries were opened on Thursday last by the Right Hon. John Bright. On the previous day a new free library was opened at Cardiff by the Mayor, Mr. Alfred Thomas. We will give some particulars of these buildings in our next.

## TENDERS

For new roads and sewer on the Streatham Estate, for Mr. Edward Roper Cook.—	
Leadbale, Regent's-park .....	21,970 0 0
Jackson, Leyton .....	1,883 0 0
Pell, Bromley .....	1,878 0 0
Bloomfield, Tottenham .....	2,219 0 0
Wilson, Walthamstow .....	1,799 0 0
Pitney, Hornsey .....	1,777 0 0
Harris, Camberwell (accepted) .....	1,765 0 0

For erection of a Workman's Club at Goshall, Surrey, for Messrs. Galligan & Son. Mr. W. Ravenscroft, architect, Reading. Quantities by Messrs. Cooper & Sons.—	
Bottrill, Reading .....	2,807 0 0
Grover, Reading .....	275 0 0
W. & G. King, Guildford .....	518 10 0
Condrey, Arborfield .....	457 0 0
Margate, Reading .....	462 0 0

\*Accepted subject to modifications.

Tenders for the first section of the Hastings Grammar School. Messrs. Jeffery & Skiller, architects, Hastings. Quantities by Messrs. Strudwick & Mennie:—

	£	s.	d.	Extra for Doubling stone.
W. J. Rodda, Hastings .....	27,365	0	0	4198
W. J. Beale, Battersea .....	7,335	0	0	150
David Parks, Hastings .....	7,049	0	0	128
D. C. Jones, Gloucester .....	6,949	0	0	288
A. D. Womersley, Hastings .....	6,938	0	0	160
W. Cossens, Hastings .....	6,900	0	0	170
James Longley, Crawley .....	6,844	0	0	186
Taylor Bros, Hastings .....	6,725	0	0	100
A. H. White, Hastings .....	6,692	0	0	83
Jas. Stubberfield, Hastings .....	6,540	0	0	40
A. Vidler, Hastings .....	6,420	0	0	46
E. & C. Harman, Hastings .....	6,235	0	0	20
P. Jenkins .....	6,160	0	0	197
Howell & Son, Hastings (accepted subject to reductions) .....	5,750	0	0	250

For roads and sewers on the Cumberland Park Estate, Acton, for Mr. C. F. Allison. Mr. Alfred Wright, architect. Quantities by Mr. C. N. L. Lailay:—

	£	s.	d.	Cumberland Woodhurst & Spencer-roads.
W. Armstrong, Chiswick .....	1,098	0	0	1,650 0 0
J. Strachan & Co., Wood-green .....	1,028	0	0	1,650 0 0
Thomas Adams, Hackney .....	1,020	0	0	1,570 0 0
John Parker, Acton .....	1,075	0	0	1,496 0 0
Nowell & Robson, Kensington .....	1,039	0	0	1,520 0 0
James Pizzev, Hornsey .....	1,085	0	0	1,465 0 0
James Hare, Clapham .....	1,055	0	0	1,450 0 0
M. W. Rowles, Acton .....	1,026	0	0	1,426 0 0
A. F. James, Hythe, Kent .....	1,035	19	3	1,411 12 8
B. Flanagan, Northampton .....	897	0	0	1,443 0 0
James Blomfield, Tottenham .....	885	0	0	1,435 0 0
John Cardus, Acton .....	878	0	0	1,359 0 0

For farm buildings at Sevenoaks, for Mr. F. Tooth. Mr. George Judge, architect. Quantities supplied by Mr. W. H. Brayshaw:—

A. Deards .....	£1,815	0	0
L. H. & R. Roberts .....	1,718	0	0
J. B. Asford .....	1,973	0	0
W. Wilshire .....	1,649	10	0
J. M. Macey & Sons .....	1,697	0	0
Clarke & Bracey .....	1,694	0	0
S. C. Parmenter (accepted) .....	1,688	0	0

**Fittings.**  
Masgrave & Co. (accepted) .....

£267	2	6
For converting school-house building, &c., at Watford, Herts, into cottages. Mr. George Judge, architect. Quantities not supplied:—		
A. W. Chadwick .....	£295	0 0
Clifford & Gough .....	544	0 0
L. H. & R. Roberts .....	495	0 0
G. & J. Waterman .....	458	0 0
T. Bonnet (accepted) .....	420	0 0

For erection of a house and offices at Goring, Oxon., for Mr. W. H. Wellsted. Mr. W. Ravenscroft, architect. Quantities by Messrs. Cooper & Sons:—

	£	s.	d.	Bathstone Corse-hill Nos. 1 & 2.	Terra Cotta.	Terra Cotta.
Higgs, Goring .....	22,174	0	0	22,150	0	0
White, Reading .....	2,107	0	0	2,051	0	0
Searle, Reading .....	2,037	0	0	1,981	0	0
Rider & Son, London .....	2,003	0	0	1,930	0	0
Dodd, Caversham .....	1,976	0	0	1,904	0	0
Cordrey, Arborfield .....	1,906	0	0	1,868	0	0
Kimberley, Banbury .....	1,898	0	0	1,860	0	0
East, Reading .....	1,865	0	0	1,833	0	0
Strong, Reading .....	1,858	0	0	1,742	0	0
Grover, Reading .....	1,801	0	0	1,838	0	0
Bottrill, Reading .....	1,770	0	0	1,710	0	0
Cook, Barchildon .....	1,609	0	0	1,575	0	0

\*Accepted subject to a few modifications.  
†Withdrawn.

For additions and alterations to the Red Lion and Wheatsheaf public-house, Deptford, for Mr. Rich. Messrs. Wilson, Son & Aldwinckle, architects. Quantities supplied:—

Beale .....	£1,559	0	0
Toms .....	1,419	0	0
Hall, Beddall & Co. ....	1,390	0	0
Cox .....	1,220	0	0
Sharnum (accepted) .....	1,210	0	0

For travelling yards at the Lambeth Workhouse. Mr. T. W. Aldwinckle, architect:—

Sawyer .....	£2350
Mayo .....	270
Taylor .....	232

For two houses at Oakfield Park, Croydon, for Mr. W. Elston. Mr. C. Hunt, architect:—

Taylor .....	£1,515	0	0
Bristow .....	1,500	0	0
Hyde .....	1,398	0	0
Hollidge & Stuart .....	1,340	0	0
Maiden & Harper .....	1,325	0	0
Smith & Bullid .....	1,085	0	0
Waddey .....	1,075	0	0

For the erection of a warehouse in Ludgate-square, St. Paul's Churchyard. Mr. Peebles, architect:—

Kirk & Randall .....	£3,371	0	0
Lathley Brothers .....	5,327	0	0
Clarke & Bracey .....	5,169	0	0
Colls & Sons .....	5,113	0	0
F. Mark .....	5,013	0	0
William Brass .....	5,004	0	0
Samuel J. Jerrard .....	4,994	0	0
Ashby Brothers .....	4,863	0	0
James Morter .....	4,387	0	0
Perry & Co. ....	4,393	0	0
E. Lawrence .....	4,587	0	0
Macey & Sons .....	4,531	0	0

For the erection of a house in the Sebert-road, Forest-gate, for Mr. J. T. Remington. Mr. H. C. Smart, architect:—

John Brickell .....	£269	2	0
Arthur Porter .....	549	0	0
Joseph T. Veaz .....	485	0	0
Thurston & Beadwell (accepted) .....	469	0	0

For new electric light works at Earl-street, Hastings.  
Mr. E. W. T. Hennah, architect:—

Rodda	£3,700 0 0
Jenkins	3,375 0 0
White	3,557 0 0
Howell & Son	3,405 0 0
Taylor	3,380 0 0
Womersley	3,350 0 0
Parks	3,348 0 0
Avis	3,385 0 0
Taylor Bros.	3,280 0 0
Viejez	3,250 0 0
Eldridge & Son	3,250 0 0
Stratfield	3,150 0 0
Michael	3,135 0 0
Elliot & Warman	3,100 0 0
Vidler (accepted)...	3,060 0 0

For the erection of a new house at Watford, Herts, for Mr. R. M. C. James. Geo. Asby Lean architect. Quantities by architect:—

B. Myring	£2,173 17 7
W. B. Neal	1,932 10 0
T. Turner	1,854 14 0
E. Louis	1,779 0 0
G. & J. Waterman	1,747 0 0
A. W. Chadwick	1,733 10 0

For the erection of Nos. 31 and 33, Harley-street, Cavendish-square. Mr. Robert Willey, architect:—

Clarke and Bracey	£5,037 0 0
Dorcy	4,511 0 0
W. Smith	4,377 0 0
Woodward	4,000 0 0
Nye	3,425 0 0
Penry & Co., Esling (accepted)	3,370 0 0

For the erection of ten new houses, Bromley, Kent, for Mr. Richard Smith. Mr. James Dudley, architect:—

W. Bamford	£2,195 0 0
H. L. Holloway	2,170 0 0
W. H. Durrant	2,159 0 0
Grubb	2,075 0 0
Satchell	1,986 0 0
Payne	1,920 0 0

For the erection of a new dwelling-house, No. 83, New-street, Deptford, and repairs to four houses adjacent, for Mr. Richard Smith. Mr. James Dudley, architect:—

W. H. Durrant	£1,857 0 0
W. Bamford	1,810 0 0
H. L. Holloway (accepted)	1,567 0 0

For new wine vaults to Messrs. Nicholson & Co.'s distillery, St. John-street, Clerkenwell. Messrs. Crickmay & Son, architects. Quantities by Messrs. Nixon & Eveson:—

Dove Bros.	£1,395 0 0
McLachlan & Sons	6,187 0 0
Brass	6,164 0 0
Higgs & Hill	5,790 0 0
Holland & Hanson	5,598 0 0
Bangs	5,548 0 0

For new parish room to St. John's Church, Angell Town, Brixton. Mr. Sextus Dyball, architect. Quantities supplied:—

	Room.	Vestibule.
Taylor	£1,030 0 0	£55 0 0
Brass	997 0 0	50 0 0
Corder	997 0 0	65 0 0
McLachlan & Sons	945 0 0	15 0 0
Dove Bros.	875 0 0	60 0 0

For alterations and additions to Dummer Rectory, Hants, for the Rev. G. Jones, M.A. Messrs. Hugh E. Raynbird & Sons, architects, Basingstoke:—

Pusey	£464 0 0
Tigwell	440 10 0
Blunden	395 0 0
Tow	386 0 0
Sims	378 0 0
Mussellwhite	394 10 0
Wilks, North Waltham	365 10 0

For alterations and additions to the Mill House, Old Basing, Hants, for Mr. J. W. Smith. Messrs. Hugh E. Raynbird & Sons, architects:—

Blunden	£392 0 0
Sims	378 15 0
Wilks	371 0 0
Mussellwhite	349 10 0
Harris & Shumwood (accepted)	332 10 7

For alterations and additions in Queen's-road, Hastings, for Mr. John Gallop. Mr. H. Ward, architect:—

Jenkins	£385 0 0
Elliot & Warman	358 0 0
Avis	325 0 0
C. & E. Harman (accepted)	315 0 0

For alterations and additions to the receiving wards and "B" Block at the workhouse, Marlborough-road, Kensington, for the guardians of the parish of Kensington. Messrs. A. & C. Harston, architects. Quantities supplied:—

Gibbs & Fiew	£2,400 0 0
Holt	2,350 0 0
Tozer	2,239 0 0
C. Wall	2,135 0 0
Lucas & Son	2,093 0 0
Thorn	2,000 0 0
Carpenter & Poole	1,997 0 0
Crockett	1,960 0 0
Mears	1,946 0 0
Ennor, Julian, & Co.	1,920 0 0
Shurmer	1,899 0 0
Nightingale, Albert Embankment (accepted)	1,866 0 0

For distemping, whitening, and other works at the Poplar and Stepney Sick Asylum, Devons-road, Bromley, for the managers. Messrs. A. & C. Harston, architects:—

Ellis & Co.	£380 0 0
Stevenson	269 0 0
A. W. Derby	248 0 0
W. Wythe, Dalton (accepted)	246 10 0

For proposed residence, Union-street, Maidstone, for Mr. F. W. Robson. Mr. Edward W. Stephens, architect:—

Avard, Maidstone	£1,197 0 0
Yaugham, Maidstone	1,170 0 0
Elmore, Maidstone	1,160 0 0
Walls & Clements, Maidstone	1,157 0 0
White & Joy, Maidstone	1,130 0 0
Simmonds, Maidstone	1,123 0 0
Cox Bros., Maidstone (accepted)	1,085 0 0

For additions and alterations at Spring Hill House, St. Mary Bourne, Hants, for Colonel Cadot. Mr. A. W. Galbraith, architect:—

Weeks, Whitechurch	£851 0 0
Beasley, Whitechurch (accepted)	770 0 0

For the erection of three shops and dwelling-houses, five cottages, stabling, &c., at Loomit Vale, Lewisham, for Mr. H. J. Perry, Reading. Mr. W. Warren, architect:—

Humphreys	£3,170 0 0
Kirk & Randall	3,150 0 0
Banks	2,979 0 0
Jerrard	2,973 0 0
Redman	2,950 0 0
H. L. Holloway (accepted)	2,925 0 0

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# The Builder.

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SATURDAY, JUNE 10, 1882.

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### The Tombs of the Giants, and the Altars of an Early Faith.



N undying interest attaches to that mysterious order of a forgotten architecture to which it is difficult to give an altogether unexceptionable name. If we say "megalithic work," we have, on the one hand, the difficulty to encounter that some of the most stupendous megalithic works known to be extant do not come within the province of which we speak; while, on the other, much work of anything but a colossal type is included within its limits. If we say "rude stone monuments," we beg the question. In the case of the most famous, and one of the most important, of the English examples, unmistakable traces of careful masonry, in the form of mortise and tenon joints, are known to exist; and it is, at all events, a sustainable theory that the main structures at Avebury, as well as at Stonehenge, were reared of wrought stone, and that the present rude irregularity of the giant blocks is due to the disintegrating influence of centuries of exposure to the weather. Nor do we see that it has anywhere been proved that the builders who could mortise together the trilithons of Stonehenge were unable to construct timber trusses that might roof much, or even the whole, of the area within a circular wall, of which the solid stone panels only are left, and left in a state of decay. We are not asserting that so it was; but the negative is only supported *ad ignorantiam*. "Prehistoric remains," again, is a term that will be objected to by those who argue that the mighty cells of Avebury were erected in a week by a victorious but illiterate army, as the memorial of the last of the twelve great battles fought by Arthur,—a theory, by the bye, which has the inconvenience of showing a retreat, instead of an advance, by the victor, after each battle. Even the very word "monument" may be demurred to. For how can those things be memorials, of which date, purport, origin, and mode of execution, are all alike hidden in the night of doubt? "Palæolithic remains," again, which seems to be almost an unexceptionable term, has been anticipated, by being referred to tools and weapons, rather than to buildings. Nor will any title be altogether adequate which fails to include those earthworks which, though in many instances their remains are rough, betoken in well-known examples an accuracy and finish in design and in execution, by the side of which the great railway embankments of our days seem the production of hasty bunglers. It is not, however, our present object to

dogmatise, or even to theorise. We wish to say a few words which may be of use, as the French say, *pour servir*; to point out the direction in which, as it seems to us, the preliminary inquiries which may throw light on a difficult subject have yet to be made. And we desire to call attention to some of those most recent, and as yet little known, discoveries and observations, the result of which can hardly fail to dissipate much of the assumption that is at present allowed to pass without question. Using, therefore, indifferently, the ordinary phrases of "rude stone monuments," "megalithic structures," and the like, under the reserve before indicated, our first remark applies to the geological relations of these remains. We are not prepared, and we know no one who is prepared, to speak with anything like exhaustive knowledge on the point. So much is this the case that we hesitate to bring forward our own views, lest we should err by too hasty generalisation. But we are sure that no genuine and unprejudiced student of the subject can contradict us when we urge the importance of a geological survey of the existing cromlechs and their congeners. By this proposed study we seek to ascertain three distinct sets of facts. First, we want to refer all structures of the kind to the sea level, by stating their elevation above it in each case. Secondly, we desire to ascertain the geological formation on which each such structure stands, and has apparently been erected. Are there any, for example, reared on later strata than the chalk, and if so, where, and on what precise beds? Thirdly, what are the lithological characters of the stones used, and whence have they been derived? Thus, at Stonehenge there are eleven stones of the inner circle which are locally called "blue stones." They are portions of igneous rocks, none resembling which are found nearer than Cornwall or than Ireland. The larger blocks, forming the greater part of the ruin, are of a fine grit-stone, which has the local name of "sarsen." These stones are described as forming "a local deposit in the bottoms of the valleys between Salisbury and Swindon." A clerical writer on Avebury evolved a theory that they were excreted from the chalk during the deluge. They form, however, objects of a distinctly recognisable lithological class, no trace of the natural occurrence of which is to be found in Wiltshire. Whence did they come? It is a question for the geologist to answer. That they were, at some remote period, borne on floes of ice, and dropped over the surface of what are now the Wiltshire downs, is one theory. And, so far as we are aware, it is the only alternative that has been offered to that of intelligent transport. As to their being scattered over the downs, the close localisation of the deposits at such places as the "Grey Wethers" and other localities near Marlborough, as well as the details of their positions, are so remarkable as to leave little doubt in our minds that we

have in such spots the ruins of ancient towns. However that may be, a possible geological explanation of the presence of the stones, and a definite tracing of them to their native sources, are yet *desiderata*, in our total ignorance of which we are but ill prepared to start or maintain a theory. The vast stones used for the cells at Avebury are 17 ft. or 18 ft. square. Were they dropped by melting icebergs at the spot, and none like to them dropped elsewhere? If we are purely and simply ignorant, let us admit it. But let us not veil our ignorance by the use of such expressions as "local deposits." The next point on which we wish to insist is, that the subject is one far too vast to admit of any hasty generalisation as to time. The assumption that all these remains belong to one and the same epoch is not one to be lightly made. Proof is necessary, before such a statement can be accepted as a canon. As to that, indeed, we are about to adduce what we think must be regarded as proof of the truth of an opposite view. But be that as it may, we content ourselves with pointing out that if it be possible to find a tribe of men who, at the present moment, are in the habit of erecting menhirs, dolmens, or any structures of the sort, we have yet to establish the fact of any connexion between them, either in blood or in time, and the builders of those giant structures in what are now the British islands, of which not even a name lingers to indicate the antiquity or the origin,—since such names as we have are, for the most part, what the philologist must regard as purely casual, and quite disconnected with any tradition of origin. The discoveries to which we refer have the unexpected result of connecting, if not the erection, yet certainly the veneration, of a hitherto little-known, though very large group of menhirs, dolmens, and the like, with a Semitic people, and that at a definite point of time; that is to say, some thirty-four centuries ago. In September, 1881, the attention of the Engineer officer commanding the survey of Eastern Syria was for some days wholly devoted to the wonderful rude stone monuments which he discovered in the district of Heshbon. West of Jordan none of these structures exist, with the exception of a few in the barbarous, and never wholly Judaised, region of Galilee. It may be suggested that the account of the iconoclastic reform under Hezekiah (2 Chron. xxxi. 1), when the holy places and the pillars were destroyed, unmistakably indicates the destruction of the two classes of structure known as the dolmens and the menhirs. Four words are used in the sacred text, which are translated "images," "groves," "high places," and "altars." The last two words are, Bamoth, which, according to Gesenius, is not originally an Aramaic word, though he connects it with the Greek *βαμός*, and applies it to any sanctuary or fane, as well as to a height, and to a fortress or castle; and Mizbechoth,



"pillars," or "things set upright." These words (מַצֵּבֶה and מִצְבָּה) are used in Numbers xiii. 41, and xiii. 1; and the occurrence of the two megalithic forms of the dolmen and the menhir, thickly besprinkled over the mountain heights that correspond minutely with the indications of locality given in the Book of Numbers, is one of the most unexpected results of the recent exploration of Moab. We must refer to the quarterly statements of the Palestine Exploration Fund for January and for April, 1882, for the details, which are numerous and minute. The outcome of the discovery is, that those spots which are indicated in the sacred text as held specially sacred by the Moabites; as visited by Balaam for the purpose of exorcising the Israelites (whose encampment might be observed from these mountain stations on the plain below), and of which the second is specially distinguished by the name of Bamoth Baal, are thickly spread with megalithic remains. These include seven distinct kinds, which it is instructive to compare with the classification of Mr. Fergusson. That gentleman distinguishes five main groups of early monumental work,—viz. (1) tumuli, (2) dolmens, (3) circles, (4) avenues, and (5) menhirs; and gives species, or subdivisions, of each. Captain Conder has distributed his discoveries into seven groups,—viz. (1) dolmens, or cromlechs; (2) menhirs, or standing stones; (3) cubical stones, in circles or standing alone; (4) circles of rude stones; (5) rude pillars; (6) cairns; (7) disc stones.

In comparing the two classifications we shall see that the omission of cairns by Mr. Fergusson may be regarded either as an oversight, or as an expression of opinion that these rude piles of stones are, for some reason, not to be regarded as forming part of the rude stone system. The avenues, which form so important a feature in our English paleolithic works, are not mentioned as found in Syria. The rude stone circles may be regarded as humble examples of that mode of structure which assumes so much dignity at Avebury and at Stonehenge. A remarkable instance at Minyeh, 30 ft. across, which is figured by Captain Conder (Quarterly Statement, April, p. 72), has an arrangement of the same kind as that of nave and chancel in the earliest Celtic churches, and should be compared with the Irish "double bee-hived cells" figured by Mr. Anderson in "Scotland in Early Christian Times." The cubical stones form, as far as we are aware, a peculiarity of the Eastern, as compared with the Western, system. And the disc stones appear, at present, as another Eastern peculiarity.

Of these groups of structures the dolmens are the most numerous in Moab. "In Wady Hesban there are 50; round Wady Jideid are groups which give a total of about 150. On the north side of the Zerka M'ain there is a large group, numbering some 150. At Mount Nebo there are only a very few, in connexion with a large stone circle and cairn." In all, there are from 600 to 700, divided into seven distinct groups, each occurring in the neighbourhood of fine springs, and of hill tops commanding an extensive view. The very name used in the Pentateuch yet lingers on the ground. A remarkable menhir, 8 ft. high, 4 ft. 6 in. broad, and about 2 ft. thick, which stands alone on a flat plateau on the north bank of the Zerka M'ain, is still called Hajr el Mansub, or the erected stone, an Arabic name closely allied to the word before translated "pillars," or "standing stones."

The occurrence of circles of menhirs, in which a single dolmen is interposed as if it were a door or *cella*, is another noteworthy feature of this remarkable group of monuments. And the term "El Mareighat," or "the smeared," which is still applied to the menhir circle by the Arabs, affords a lingering testimony to the rites of the ancient worship; whether, as in the case of the metzebah erected by Jacob, on which he poured oil (Gen. xxviii. 18), or as in that of the triple erection of seven metzeboths by Balak, on each of which Balaam shed the blood of a bullock and of a ram. Connected with this ancient rite, we note the occurrence of cup-shaped hollows in some of the menhirs; the application of the name Hajr-ed-Dumra (stone of blood) to a cromlech in Galilee; and the very frequent presence of basins, or hollows, in the table stones of many of the dolmens. Similar hollows are often formed in the surface of the rock itself, beside these monuments; and the

frequent occurrence of these cup-shaped hollows in Palestine, which for many years puzzled the Survey party, may be thought to mark the sites of dolmens or menhirs which were destroyed according to the injunctions of the Pentateuch (Deut. xii. 3). It may be suggested that the prohibition to use an iron tool upon the altar stone (Deut. xxvii. 5; Exod. xx. 25; Joshua viii. 31) may have had reference to the pagan rite. Of the disc stones, one of 10 ft. 6 in. in diameter, was pierced with a hole of 2 ft. diameter in the midst. Others were without any holes.

Whoever raised the menhirs and dolmens of Moab, the history of the Bible, as illustrated by the recent discoveries of the Survey party under Captain Conder, assures us of the fact of their use as implements of worship before and at the time of the exodus. The removal of these monuments in Palestine, in obedience to the injunctions of the Law, is a fact hardly to be questioned. But the extraordinary range in time which is covered by the observance of the fact of the lingering of similar erections and observances among the Arabs to the present day; while, on the other hand, at the time of the exodus, the dolmens appear to have been spoken of in connexion with "the giants."

For it is only the Rabbinical pointing of the third or fourth century of our era which led St. Jerome to translate the Hebrew word מַצֵּבֶה, which occurs in the Book of Deuteronomy (iii. 11) by the Latin *lectus*, whence the English translators took the word "bedstead," although the word, recurring twice in the same way, is differently pointed each time. The word translated "iron" is derived from a root meaning to transfix; but a very closely similar word is used by the Talmudical writers to signify "prince." That "his vault was the vault of a prince," or that it was a vault of rock, would probably be a better rendering of the sense of the phrase than that of the Vulgate. St. Jerome does not attempt a literal translation, for he omits the double use of the Hebrew word. However this may be, the mention made of the "remnant," or, perhaps, more correctly, of the "eminence, of the Rephaim," carries back the imagination to very ancient times. To say nothing here of the marvellous legends of the size and might of Og, King of Bashan, which are to be found in the Gemara of the tract Berachot of the Talmud, sacred and profane literature both glance back to the early times of the Rephaim, Titans, or giants. For a dolmen, 12 ft. by 5 ft. 4 in. would not be an out-of-the-way size. One was measured at Amman 13 ft. by 11 ft. on the top stone. It had four large shallow basins formed in it from 1 ft. to 2 ft. in length, and about 12 in. deep, and channels led from the upper edge of the stone, which is tilted considerably out of the level, to one hollow in the centre of the table. We do not wish to run any analogy to death, or to insist either on translation or on inference. But the lingering of the tradition of the giants amid these early forms of megalithic work seems to us to concur with much that is to be observed in our own country to indicate an origin for these structures disconnected with any races known to us to have dwelt amid their shadows, even if later peoples adopted the haunts of an ancient worship for the performance of their own rites.

Let it not be said that this is a fanciful mode of approaching a serious subject. So far is this from being the case, that the known and indisputable facts are more strange than the wildest fiction. We are, most of us, familiar from our childhood with the language of that ancient book which has been, in its actual English form, in the hands of our forefathers since the time of Queen Elizabeth; while it has been known, in its Latin translation, to the Catholic Church from the time of Constantine. From that Emperor's date to our own, neither pilgrim nor crusader, monk nor bishop, churchman nor man of letters, has been able to explain many of the topographical references with which the Pentateuch and the Prophetic books are filled. A few English gentlemen, each, no doubt, happy in some theory of his own,—for who that took not enough interest in the subject to form some hypothesis would have devoted time and money to its elucidation?—under the patronage of her Majesty the Queen, and the presidency of his Grace the Archbishop of York, drew together with the aim of collecting the topographical information necessary to the full understanding of the sacred text. The highly-educated scientific corps of the Royal Engineers, by the

consent of H.R.H. the Commander-in-Chief, furnished the surveyors,—who, by a curious coincidence that it may be permitted to mention, were placed under the command of an officer who is a descendant of the first Christian knight that was slain in the first Crusade. After seven years of partially interrupted work, a map of Palestine, equal in scale, in accuracy, and in beauty, to the Ordnance map of England, was given to Christendom. Within three years of its completion, and before the accompanying memoir was through the press, the same officer started on the survey of Eastern Syria. The air-drawn lines of the trigonometric survey were pushed over Jordan; and Bamoth Baal, "the top of Pisgah on the field of Zephim," and "the top of Peor that looketh toward Jeshimon," have been linked by the magic power of the theodolite with Kura Sartabeh, Jebel Karantal, and the already surveyed mountains of Palestine. And there, on the very spot where the ancient soothsayer "lifted up his eyes, and saw Israel abiding in his tents according to their tribes," are found circles, and dolmens, and menhirs that were the sacred places of a worship older than Judaism. Whether the altars erected by Balak are now standing, whether they took the form of dolmen or of menhir, of *βωμὴς* of earth, or of pyre of wood, and whether the seven stone monuments on the plateau above Air Minyeh may be actually one of the groups of seven erected by Balak, may be in doubt. But that the Bamoth Baal now photographed by Lieutenant Mantell were existing and venerated in the time of Moses, there seems no room for even the shadow of a doubt. The very translation of the Hebrew words is identified by the Survey.

That this is a great gain both to Biblical explanation and to Oriental archaeology there can be no dispute. We have not now room to enter into the fascinating subject of the light which Oriental, and notably Indian, study throws on the symbolism of the dolmen and of the menhir. But there is quite enough in the Pentateuch, and more than enough in the Talmud, to confirm the indications hinted at by Captain Conder. Of the connexion of the cairn with the worship of Nebo, or Mercury (akin to the Terminal God of Western nations), no student of the Talmud can be ignorant. The symbolism of the menhir is not now for the first time to be insisted on. What will be most fresh to many English archaeologists is the connexion now suggested between the dolmen, the arca or chest, and the plain cubical stone, as the symbols of Allat, Venus, Diana, or the great mother-goddess, the *Bona Dea* of the West. And it is not without interest, as bearing on the subject of the vast range in time over which the rites practised on the dolmen and menhir sites range, that while there is a record of the performance of human sacrifice in Moab as late as the date of the Moabite stone (2 Kings iii. 27); and while the seven altars of Balak are closely connected with the rites of the worship of Chiuu, Saturn, or Moloch, to whom human sacrifices were offered, such an amelioration of the ancient ferocity that may be thought to have been originally associated with the menhir had occurred by the date of the exodus that on the supreme occasion of the sacrifice of Balaam we hear of no blood being shed but that of bullocks and of rams.

It is not, of course, our purpose to insist that all dolmens were shrines, or that all menhirs were either idols or altars. Rather should we suggest that around the primary form of the Ark and of the Pillar gathered praying-places, and tombs, and shrines; or even treasuries and dwelling-places. But that the central ideas of the dolmen, the menhir, and the cairn were those of a very ancient religion, which (little though it be suspected by the ordinary European) is yet living and powerful in India; that these traditions connect the ancient astrological worship, the rite of human sacrifice, the licentious orgies of Baal Peor, the Babylonian worship described by Herodotus, the Paganism overthrown by Mohammed, and the vast remnants of the almost inconceivable magnificence of Avebury and of Stonehenge, we think there is little room to doubt. The survey of these ruins will be looked for with extreme interest. As far as we are at present aware, no system of orientation has yet been discovered to exist. We venture to suggest that the introduction of orientation may be held to indicate a change from planetary to solar worship. No orientation is naturally connected with the irregular motion of the moon.



THE PARIS EXHIBITION OF  
DECORATIVE ARTS.

WHEN first, not long since, the conception of the Museum of Decorative Arts was made known in Paris, the universal opinion expressed was in favour of the immediate formation there of a Museum resembling our South Kensington Museum, and Paris, which already boasts so many choice collections of works of art, fairly had to admit that she possessed no such institution as that we owe in such great part to the energy of one who has only within a few weeks died, full of honour, Sir Henry Cole. Reflection has since shown our neighbours that to attempt such a scheme was out of place; the authorities have determined to confine themselves solely to the speciality of "Decorative Art" in its bearings on the so-called art-manufactures of the country. With this view, an innovation has been introduced by the formation of a yearly exhibition held at the same time, and, though separate, in the same building as the annual *Salon*, and devoted entirely to the productions of decorative art. This year's Exhibition brilliantly opens the series, the success of which we sincerely trust may lead on our side of the Channel to a companion institution. As with our neighbours, our artists are turning their attention more than ever, or rather only as they did in the past,—to the subject of decorative art, which can ill be shown in our existing picture exhibitions, while, in an entirely different direction, the impetus given to the production of decorative objects of every nature has already called forth, and is daily calling forth, fresh artistic talent that requires encouragement and formation.

This first exhibition of the decorative arts boldly embraces almost all the existing types of decorative art. Here we see exhibited a large number of decorative panels by some of the best known painters,—important works intended for public buildings, such as M. Carolus Duran's colossal ceiling, painted at the request of the Government, for the Palace of the Senate at the Luxembourg, and shown here in the position it will occupy, with a companion canvas for the same building by M. Robert Fleury,—both important works, which, however open to criticism they may be, belong to a school of decorative art the traditions of which are still kept alive abroad by magnificent commissions such as these. M. Gervex exhibits a number of the important decorative paintings for the *mairie*, or town-hall, of La Villette, for which, in the competition referred to by us at the time it was held, he showed himself so ably fitted. To display both M. Carolus Duran's ceiling and that of M. Gervex, it may be mentioned that the old-fashioned plan of a mirror has been wisely adopted. Round the rooms in which these paintings are exhibited, are further shown the original chalk and other studies made for the completed works. M. Mazerolles, the talented painter of the ceiling of the *Théâtre Français*, is well represented, as also M. Régimier and M. De Nittis, while M. Galland, Professor at the *École des Beaux-Arts*, whose name and work are not unknown in London has, every one will be glad to see, left at the exhibition the mass of picturesque and masterly sketches, chalk studies, and decorative designs which last year formed so conspicuous a feature in the museum. In an adjoining room is a very large piece of modern tapestry executed by Messrs. Bracquemond, for, if we mistake not, the *Hôtel de Ville* of Brussels, and which, produced in that home of the tapestry-weaver's art, shows us that if the glories of the past cannot be equalled, its traditions have not been allowed to die out. In this same room there are numerous other designs for the loom, some of Belgian, some of French origin, more than amply sufficient to rouse in our Royal Tapestry Works a spirit of emulation which should preserve them, we trust, from the fate which has befallen the South Kensington School of Mosaic. Surrounded by a large number of pictures, all essentially of what we call a decorative character, M. Gérôme's grand bronze figure of the Roman gladiator, —reproduced by the painter from his familiar picture of "Police Verso,"—shows, what sculptors have been ever ready to admit, how successfully a painter, when he is a true artist, can excel when he takes the modelling-tool and chisel in hand.

The section devoted to drawings of decorative architecture, if not large, and in taste very French, according to our English ideas, still not unfaithfully displays one of the most important

branches of the decorative arts which the exhibition is intended to encourage; a word, too, to add to the introduction of photographs of executed works. Among the drawings not the least interesting is that which shows the whole interior construction of the colossal figure of Liberty which M. Bartholdi, the sculptor, is setting up in the workshops of MM. Gaget and Gautier, to be placed in a year or so on Bedloe Island at the entrance of New York Bay. To the designs for the potter and ceramic artist, arranged on a special screen, a similar remark to that passed on the architectural drawings is applicable; they represent another important branch of the decorative arts, and as such have not been omitted from the exhibition.

A case is devoted to the display of a number of specimens of purely artistic jewelry. The gold and silver damascene work, were it not that the Spaniards have still retained the art, would certainly give to the French the first place as revivers of one of the most exquisite of all the forms of decorative art. There are several other specimens of similar refined and truly artistic work (among these a sword-hilt of chiselled steel) such as it seems the French alone can produce.

A room in the Exhibition has been specially set aside for the display of a number of modern objects of decorative art of the choicer nature, works in crystal, ivory, gold, silver, and bronze, and very rich is the general effect; it is, however, difficult for the cultivated eye, and especially, we suspect, that of the English visitor, to be entirely satisfied with this result of so much expenditure and undoubted talent. The French are equally aware of the fact, and it is in a measure to correct and sober the taste of their skilful industrial artists that these exhibitions have been instituted.

It cannot be said that there are wanting the choicest examples for study, from the delicate Classic terra-cotta figures from Tanagra side by side with the scarcely less fragile *lekuthoi*, the choicest products of the Greek potter's art down to the Japanese drawings of Hoku-sai, with all the intermediate representations of art, Classic, Christian, Medieval, Renaissance, and Decadence; Northern, Southern, Eastern, and Western; and each just in sufficient quantity not to bewilder the mind, but to furnish the student characteristic examples of each period of art.

As one enters it is impossible to overlook the huge cast of the wonderful door of the great Buddhist Tope of Sanchi, a generous gift of the South Kensington Museum, which is further represented in the Exhibition by a loan of some valuable Persian metal work. On the landing, in several cases, are displayed a number of exquisitely illuminated Persian manuscripts from the library of Firmin-Didot, models of a decorative art that perhaps possesses no rival for colour, suggestiveness, and simplicity. In the first room are gathered a collection of Italian Renaissance bronze works,—models, again, in their style of decorative beauty, only surpassed by the large and important collection contributed by M. Gréau, of Classical and Gaulish works in metal,—a gathering of rare and beautiful objects which we remember to have seen and spoken of at the time they were first exhibited some years ago in Paris. A Roman bronze car, or, rather, the fragments pieced together on a wooden foundation, is a rare specimen of Classic decorative art; it was found near Iasid, on the Sea of Marmora, where it is known that Diocletian lived, and it is supposed to have belonged to that emperor. By the side of this delicate work, a collection of Gothic wood carvings, among them a quaint and early rood and a rare carved oak-chest, with figures in costume of Chaucer's time, reveal a very different aspect of the industrial artistic creative power.

The space at our disposal, already largely encroached upon, permits us only a hasty mention of the collection of fans, the Gobelins tapestry, the modern Limoges enamel, the modern stained glass, by no means creditable; and the specimen of Salvati mosaic work, not efficiently represented, considering the decorative value of the material. Messrs. Powell have presented the Museum with a collection of specimens of their beautiful work, which holds well its place beside a case of real Venetian glass; but two other English firms, well known for their artistic productions, we regret to see but insufficiently represented. Messrs. Doulton should follow the example of Messrs. Powell, and present to the Museum a collection of

specimens of their very characteristic stoneware, which would not only do honour to our country, but extend more than at present is the case the fame of their very creditable products. As it is, the well-known Lambeth potteries are only represented by a frame of tiles, which is somewhat ignominiously placed in a corner. Messrs. Minton, again, are represented by only one plate, and that not by any means a good specimen of their work. Before concluding, notice is due to the large and interesting collection of decorative designs executed by Giulio Romano for the Duke of Mantua, contributed by Mr. J. C. Robinson.

THE FUNERAL TENT OF AN EGYPTIAN  
QUEEN.

UNDER this title, Mr. Villiers Stuart, the author of "Nile Gleanings," a book which we noticed on its appearance some time since, has published another volume of notes on and illustrations of things Egyptian.\* The subject thus indicated only occupies a portion of the volume to which it gives its title. The remainder is occupied with remarks on the Pyramids of Dashoor, Meidum, and Sakkarah, and other miscellaneous observations upon Egyptian antiquities. But the subject from which the book is named constitutes its main interest, as it concerns an unusual relic of Egyptian work, and the author here gives the first published drawings and description of it.

This was part of the relics discovered at Deir el Bahari a few months since, in the corridors of pyramids containing about forty royal mummies of kings, queens, princes, and princesses, and some thousands of articles of various kinds, which had been previously discovered and in part "looted" by the Arabs for sale to the Europeans, before the Arabs discovered whence these treasures came. A strange and pathetic incident is related by the author, on the authority of an eye-witness, as accompanying the removal of these relics to Cairo. The mummies were conveyed across the Nile to Luxor, and then placed on board a steamer for conveyance to Cairo. It appears that numbers of native women appeared on both banks of the Nile, as the boat started down the stream, wailing and lamenting, after the manner of Eastern mourners; the men also accompanied them, firing muskets, a custom at Arab funeral processions. We are so little accustomed to connect in our minds the downtrodden populace of Egypt of to-day with the great races whose monuments are of such interest to us now, that it is almost startling to be told of this unexpected outburst, as it were, of a consciousness of past greatness which seems to have been excited by the removal of the remains of the ancient Egyptian monarchs from their long resting-place.

Some interesting details about the mummies and other objects brought away at the same time we must pass over, to mention the object which is foremost in interest. This was the canopy or funeral tent of Queen Isi em Kheb, of which Mr. Stuart offers to the public the only drawings yet taken. The tent he describes as "a mosaic of leather work, consisting of thousands of pieces of gazelle hide, stitched together with thread of colours to match. The edges are neatly bound with a pink cord of twisted leather, sewn on with stout pink thread; each colour is a separate piece, no one section bearing two colours; thus each square of the chessboard-patterned stool on which the gazelles are kneeling is a distinct morsel stitched to its neighbour. The whole work is, in fact, a mosaic, and is the only example yet discovered of what may be called ancient Egyptian tapestry." The material, though according to Mr. Stuart its colour is wonderfully well preserved, considering that it was contemporary with Solomon, is so fragile from age that it requires the greatest care in handling, and at the date of the writing of the author's remarks it had not been exhibited to the public in consequence. He was allowed to have it spread out on the floor of a private room for a whole day, in order to sketch the details and make notes of the colour. The tent or canopy, for the latter is the more correct name for it, con-

\* The Funeral Tent of an Egyptian Queen. Printed in Colours, in fac-simile, from the Author's Drawings taken at Boulak. Together with the latest information regarding Monuments and Discoveries; with Translations of the hieroglyphic Texts and explanatory Notices of the various Emblems. By Villiers Stuart, of Dromana, M.P. With numerous illustrations. London: John Murray, 1882.



sists of a central panel, 9 ft. by 6 ft., divided longitudinally into two sections, on either side of the centre line, the two halves thus formed being treated quite differently, one consisting of a powdering of circular floral ornaments on a blue ground, the other of a succession of conventional representations of vultures with outstretched wings, treated in that bold conventional manner in which the Egyptians so well applied the form of a wing as an ornamental feature. Between these vulture emblems are bars of ornament with a row of circular flowers similar to the powdering on the other side, and on each side of the centre panel is a flap with emblematic devices, kneeling harts, ducks (apparently), and a lotus ornament arranged much like the Greek honeysuckle ornament, spreading each way from a centre. These emblems are separated from the centre panel by a strong band of stripes and a continuous ornament of repetition which is common in Egyptian work, and looks something like the repetition of the conventional drawing of an elongated vase or flask, repeated in close succession. Each side of the canopy appears to have been closed by a vertical hanging piece, ornamented only with large chessboard chequers in red and green; at least, we gather from the illustration that these portions are in reality the perpendicular sides of the canopy, though, for convenience of illustration, they are drawn in the same plane as the rest. The whole fabric, the author tells us, is 22 ft. 6 in. in length and 19 ft. 6 in. in width over its extreme dimensions, and covers a space of 201 square feet of leather. The author assures us that the greatest care has been given towards reproducing correctly, in a large chromo-lithograph, the original colouring.

One or two of the emblems are, as far as we remember, unusual; in other respects the design is in keeping with the general character of Egyptian design, but the manner of its execution is a novelty, and the whole is a most interesting and effective piece of work, for the delineation of which Mr. Stuart deserves the thanks of artists and archaeologists. There is other matter of interest in his book, which is largely illustrated with outline copies, chiefly from bas-reliefs, some of which are so likely to be injured or destroyed that a record of the facts of the designs may prove of double value. The author writes in an easy, chatty manner, which, though pleasant to read, rather suggests the idea that some of his conclusions have been arrived at in an equally easy manner, and that he is, like another English writer of greater celebrity, a little too sure. But of the value and interest of his delineation of the "funeral tent" there seems to be no doubt, and it is a very interesting and charming incident in Egyptian archaeology.

#### THE INFLUENCE OF RITUAL ON CHURCH ARCHITECTURE.

ARCHITECTURAL ASSOCIATION.

MR. E. ELDON DEANE, in commencing his paper on this subject, read before the last meeting of the Architectural Association, observed that it was very good and gratifying, in these days of general architectural licence, to revert to first principles. It was likewise good and refreshing, when weary with the effort to discriminate between the many-spired and Gothic-windowed buildings put up by our too numerous Protestant sects and the Established Church of the land,—involving very much mimicry,—to perceive the aims of a section of the members of the national church, which aims were the assertion of a ritual, the reverent carrying out of that ritual, and the beautifying and adornment of church buildings so as to enable Christians to know a church when they see one. In fulfilment of Mr. Burgess's counsel in his Essay on Art and Religion, a great many of the clergy had got into the habit of keeping their churches open all day, and had discovered that people took more interest in what they saw every day of their lives than in what they saw only once a week. Mr. Street wrote of the artists of the Middle Ages:—"They were men who had a faith, and hearts earnestly bent on the propagation of that faith," and he questioned his readers, "Have we less to contend for, less faith to exhibit, or less sacrifice to offer than they?" Surely not. The Ritualistic movement was one which pervaded not the clergy only; it seemed like a call from the more spiritually-minded of the Church's members to open all

those "silent sepulchres" which bristled on all hands with their spires and pinnacles,—to drive out the spirit of sleep pervading and holding in unmeaning silence those empty and mouldy halls for six days of the week, and to let in the breath of life,—to let human sympathies be allied with the principles of worship, and to allow of the combination of artistic with spiritual aspirations. When we referred to the origin of Christian ritual in the rites of the Tabernacle of Moses, we could observe at the same time the assimilation in the plan of their churches of the general arrangement of the Divinely-appointed type. Whether it was adopted from perception of it as a key or type, or whether the earliest Christians approximated the Jewish form and plan in order not to offend the Jewish converts, it was not easy to affirm. As to liturgical acts or rites, we learned from St. Chrysostom that every festival had its appointed services and set prayers, psalms, and lessons. The ancient Gallican liturgy which St. Augustine found used in England was well known to have come from Ephesus, where St. John spent the latter half of his life,—not from Rome. The development of the liturgy in England through slow centuries, and its eventual almost general acceptance in the form of the Sarum Breviary and Missal of A.D. 1085, witnessed wonderful advances in church architecture simultaneously going on, and that same liturgy, with occasional emendations, continued in use during the progress of ecclesiastical art and architecture to the attainment of their climax. Referring to the Decorated period, Paley exclaims: "This was the glorious age of church architecture. It was the climax beyond which Christian art was never carried, though all that riches, devoted piety, and sublime talents could effect was done to sustain its consummate excellence. It followed the universal law, and having once reached perfection began gradually to decline." And soon followed the revival of the Sarum use. The Genevan party succeeded in getting altars removed by royal injunction in the third year of Edward VI.; still, after the storm was past, the rubrics of Elizabeth and Charles II. deliberately ordered that the ornaments of the churches were to remain the same as in the second year of Edward VI. Paley, in his admirable allegorical story of "The Gothic Restorers" showed that from the time of James I. to Charles I. rood-screens were erected in new churches, and where the old screens had been destroyed or removed. The number of Jacobean or debased screens he had seen was a very interesting token of this Catholic practice by the Reformed Church, and "in several instances," he adds, "I have seen Jacobean doors added to existing screens." Even Wren's churches always had screens, and, in truth, till within the last hundred years they were scarcely ever omitted. (See the Church of St. John the Evangelist, Leeds, for an example of one of the time of Charles II.) After referring to the strife as to Church matters which characterised the days of the Stuarts and of the Commonwealth, the period of exhaustion and apathy which succeeded being but the natural sequel to such turmoil, the lecturer went on to say that he regarded the general tendency of the Ritualistic movement in the Church of England as beneficial in promoting those higher aspirations after art and beauty, as well as for religion, manifested in a few typical churches. It was, he said, quite possible to be a fervent religionist, while no enthusiast in art. On the other hand, it was quite possible to make a god of Art, and to study it without any regard to the living soul, which, as Ruskin said, Religion gave to it. A church architect ought to be a true Churchman. Mr. Street was an eminently stanch Churchman, and we could not but be impressed with the religious sincerity he put into all his church work. There was no trifling or mere fancifulness, but the double witness of profound knowledge and power, with profound faith, in all the churches he had the happiness to complete. The Church of St. Mary Magdalene, Paddington, was an instance. Reverting to the emblematic meaning adopted by the early Christians in their buildings, the lecturer said that the adoption of the basilica for their worship in the first place might have had, and no doubt did have, some influence on the arrangement of their church plans in succeeding times. The threefold divisions of the body of these buildings, giving them a nave and side aisles, was partly, in all probability, due to considerations of economy in the roofing; still, it

coincided with Christian views, and had been generally retained up to the present day. Again, the plan of the cross had, from the earliest times, found favour, and no wonder, the twofold division and treatment of nave and chancel decoratively being indicative of the Church Militant and the Church Triumphant. Another noticeable piece of symbolism was the inclination of the chancel northwards,—a deviation which, according to Durandus, who wrote in the thirteenth century, was to be observed in a quarter of the churches in England in his day, and which was intended to symbolise the inclination of our Saviour's head on the cross. Having cited other examples of this kind, the lecturer referred to ecclesiastical sculpture and decoration, commencing with the art of the catacombs. As art developed in Christendom the more beautiful the sculpture and painting, the vestments, shrines, and furniture of churches, became. After referring to the symbolism of grotesques, &c., the lecturer proceeded:—

Amongst the many churches built for the High Church or Ritualistic party, let us refer to just one or two nearest us and familiar to most of us. Let us take All Saints', Margaret-street (Mr. Butterfield's), St. Mary Magdalene, Paddington (Mr. Street's), and St. Augustine's, Kilburn and St. Peter's, Vauxhall (Mr. Pearson's). In plan they vary according to circumstances. The cross form is only noticeable in Mr. Pearson's two; an ambulatory only in that of St. Augustine's, Kilburn; no rood-screens, but a screen wall and a light ornamental screen or rail, are observable. The number of steps varies, I believe, in each one. I will also refer to two churches by Mr. Burgess at Studley and Skelton, and to the interior of the Guards' Chapel at Wellington Barracks, St. James's Park, by Mr. Street, as specimens of thorough church decoration embodying a vast amount of symbolic meaning and truth. Here let me remark what fine scope is opened out to the architect in the re-introduction of the ambulatory and its use for processions. Processions in the olden days meant a choir movement, marshalled by the sacristan. The origin, according to Mr. Mackenzie Walcott, may have been an imitation of the heavenly bodies,—the courses of the stars, revolutions of the seasons, and, more immediately, the ancient religious dances. A procession is progressive, and used as it formerly was, headed by the clergy, to implore divine grace on the fields, or round cemeteries and cloisters to point to our last home, was full of meaning,—

"Hark! From the little village below us the bells of the church are ringing for rain!  
Priests and peasants in long procession come forth and kneel on the arid plain."

Mr. Deane then went on to describe the churches alluded to as follows:—In entering St. Augustine's an impressive arrests us, to be found in but few modern churches,—a spaciousness which affects us in a wholesome manner. We feel we can breathe, whilst our eye is charmed with the beautiful vista from end to end. This same spaciousness it appears to have been his effort to produce in St. Peter's, Vauxhall, but the style is rather against it. But we see it again manifested in his church in Red Lion-square, in which the continuous lancet-proportioned arcade, which would by itself give a somewhat painful verticality, is wonderfully relieved by the continuous vaulting of the roof, in which the vertical lines of the shingle shafts cross and branch out in the groin ribs. Note how this verticality is tied in by the horizontal lines of the gallery which runs round the church and crosses the ends, and also brings into relief the horizontal treatment of the east and west ends and gables. As to plan, that of a Latin cross,—the transepts forming the arms,—we enter near the west end by a north or south porch, and are confronted by the font, which is centrally placed and raised upon three steps, with an ornamental screen rail round. The double-arched division of the lower story of the west wall gives wonderful emphasis and meaning to the sculptured figure of John the Baptist placed in the central spandrel. No forced imaginativeness could exceed in power the simple directness of this arrangement. The deep-shadowed recess under the two arches, unlighted save by two small lancet lights at the extreme sides and centrally facing the narrow-vaulted aisles, representing in stained glass our first parents after the Fall, brings into fine relief the symbol of regenerate life, i.e. the font. Pursuing the plan, there is noticeable an ambulatory following



the nave-aisles round the sanctuary, which is made use of in processions. I am informed that on certain days, when all the children of the guild join in procession, the whole available space—that is, the aisles and ambulatory,—are simultaneously filled. The serpentine motion or progression, with musical accompaniment, must have a fine effect. Whether the convenience of the clergy in passing round to the south chapel, or the use for processions, dictated this arrangement, the reservation of ambulatory space for the circumscribing the place of highest mysteries in procession of song suggests fruitful reflection. At present there is no rood-screen or screen-wall; but in many particulars the church is not yet complete.

In St. Peter's, Vauxhall, we find no ambulatory, and the font is placed in the south-west, under the tower, but the position is emphasised by the treatment of the coloured glass that lights the baptistery. Entering by a west door,—over which, in the tympanum of arch, is sculptured Christ in a *vesica piscis* sending forth the reapers,—our eye ranges from the nave vaulting to the richly-treated apse to sanctuary, with broad bands of colour decoration in figure treatment under the triforium, and which is carried round over the nave arcade. Scenes from the Passion are in the apse, but the nave spaces are not yet filled in. There is a rich reredos in marble and porphyry, gilt mosaic nimbus containing a cross and emblems of the four Evangelists, with a rich dorsal on either side. One would like to see one of Mr. Pearson's churches completed in every respect, including coloured decoration. As far as one observes, he studies the position and meaning of everything he designs and places in his churches.

St. Mary Magdalene, Paddington.—Mr. Street's,—impresses the visitor with the religious feeling which the decorative treatment breathes forth. Beautiful and complete from end to end, its impressiveness inspires the desire for worship. The plan, evolved out of an economising of space, possesses no apparent arrangement to which we could attach any special symbolic meaning. The rise to the chancel floor of five steps is effective and marked. The sanctuary floor is laid with encaustic and enamelled tiles and marble immediately within the rails, the width being divided into three large circles, each of rich colour and design, of many diminishing concentric circles. Entering by a north or south porch,—the west end of nave—lower story,—is a threefold arcade, under the southernmost arch of which is the baptistery. The nave itself is of six bays, with triple clearstory lights over the arcade, surmounted by a continuous wagon-vaulted roof. Commencing at the west end, in the circular light over the west windows is represented in stained glass Christ in glory, with worshipping angels, the lower lights being filled in with figures representing the Te Deum. The aisle lancet windows are filled in with figures of our early saints. Large sculptured figures of the prophets, the Psalmist, and others of the Old Testament, are placed over the frieze of the arcade, the circular sunk panels in spandrels containing scenes from the Passion of Our Lord, reminding one somewhat of the stations used by the Romanists, but significant in their progress towards the chancel. Over the chancel arch, in three large circles, are carved foliated crosses.

In the coloured decoration of the nave roof the heads of saints and martyrs in the panels are all turned looking eastwards. A rich alabaster dado runs round the chancel and sanctuary walls, with a border of inlaid marbles diapered, in this are seven sunk white marble lozenge-shaped panels, containing the "Six Days of Creation and the Sabbath Rest" carved in low relief. Over this border is a broad band diapered with hexagonal sunk panels, containing in coloured mosaics subjects from the Gospels, as the Good Shepherd, the Prodigal, Christ's look upon Peter at his denial, &c. This band reaches to the sill of windows, which are filled with stained glass in two tiers of subjects, representing scenes from Our Lord's life, from His nativity to His passion and resurrection. The vaulted bays contain Christ's session in glory, surrounded by prophets, saints, and martyrs, cherubim and seraphim, and all the heavenly hierarchy. The reredos contains the Crucifixion, with the three Marys, and the Twelve Apostles ranged beneath. Note the design of the masterhand in the altar-cloth, banners, carpet to altar, and mat before altar-rails, and indeed in everything in the church, and the fulness of meaning in the

position and design of every figure subject, whether in sculpture or glass or in the roof decoration. How boldly positive and masculine the treatment throughout, yet, withal, what extreme delicacy and refinement is seen in every detail! St. Margaret's, East Grinstead, is a church I wished to describe, but time does not permit, though the church is well worthy of close study.

The Guards' Chapel is a new interior to a barn-shaped shell of Greek form, and conspicuous from its look of forsakenness. Enter the doors, and you are confronted with the most elaborate and consummately-decorated church interior in London, perhaps in the kingdom. The treatment in Byzantine character lent to the author a scope and opportunity for colour which he has used with wonderful results.

All Saints, Margaret-street.—Mr. Butterfield's,—another well-known Ritualistic church, is richly decorated, but has less of symbolic meaning contained in it than those I have mentioned. A nave, with equal north and south aisles, forms the body of the church. The baptistery is placed in the south-west corner of the aisle, but surrounded with a handsome wrought-iron grille, surmounted by a pendent cross.

Mr. Burges's church in Studley Park, for the Marquis of Ripon, and his memorial church at Skelton to Mr. Vyner, who was killed by the Greek brigands, are beautiful structures, the first about three miles in a direct line east and west, with Ripon Cathedral, amidst beautiful scenery, and the latter about four miles the other side of Ripon. Both are somewhat similar in plan, that of Studley being hexagonally apsed; each has a south porch and a tower and spire,—Skelton on the north side, and Studley at the west end. They are not Ritualistic churches, but are illustrative of what a profuseness of deep thought and suggestiveness is offered to the intelligent mind surveying the decorative treatment. The former is more complete. The plan is a nave and equal aisles. In each church the baptistery is placed on the left of the visitor as he enters the south porch,—i.e., the south-west angle or corner of the aisle. The organ fills, in Studley church, one of the nave arches; in Skelton it is likewise on the north side of the nave, against the chancel arch, but one step to the chancel, without the screen wall. At the outset, just on entering the chancel at Studley, is the text, in mosaics, "We will go into the house of the Lord; our feet shall stand in thy gates, O Zion," and this seems the key of the decorative treatment. Approaching up the gateway between the choir-seats, and extending along before the sanctuary, we have represented in the floor, in marble mosaics, the following subjects:—The Tower of David, the Golden Gate, the Temple, the Dolorous Arch, the Tomb of the Virgin, Gethsemane, Golgotha, and the Holy Sepulchre, all reminders of the sorrowful Passion. But entering the sanctuary,—the pavement of which is also in rich marble mosaics,—a winged cherub confronts us, with flaming sword, guarding the entrance to Paradise, which is here beautifully and touchingly portrayed in delicate and dainty rose tints on a white ground. We have the Tree of Life diapered over it, bounded by a continuous range of mountains all round, with the four rivers which watered the garden flowing round at the base immediately against the wall. Circled in and cinquefoil, in each angle is a figure of a man pouring out water from a vessel,—emblematical of the source of the four streams. The carved figures on the end of the choir-benches are Solomon and David. The sanctuary and chancel are in two bays, the latter with an ordinary wagon-vault, the former developed from the square into a dome; the four spandrels having, on carved brackets, sculptured and gilt figures of angels with trumpets, holding back the four winds. The dome, in three tiers of trefoiled canopies or panels, contains in the lower tier martyrs, and above, the angelic host with musical instruments. The crown of the vault is blue with gilt stars. The richly-traceried windows represent scenes from the Apocalypse, elaborately and skilfully arranged and positioned.

The Skelton church decorations are less complete, the floor being only of tiles at present. The east window of five lights contains scenes from the Passion and Christ in glory with the angelic host; windows in the north and south walls of the chancel, scenes from the Old and New Testament; the reredos is carved and sculptured in marbles, in four circular sunk panels represent-

ing prophets, and in the centre the Adoration of the Magi. Over the chancel arch, on the west side, is sculptured in high relief the twelve apostles with Christ in a nimbus or *vesica piscis*; the west window (wheel), Christ enthroned in glory, with the different callings or states of men worshipping around. On the outside are four figures sculptured, representing the four ages of man,—youth, manhood, old age, and death; over the south porch in the gable, Christ the Good Shepherd; and over the east window, Christ in a *vesica piscis*, showing the print of the nails in His hands, in the Resurrection. In the font-cover is a carved figure of John the Baptist; and carved in the font, panels with figures representing the four ages. The beautiful white stone used in these churches sets off to advantage the severe simplicity of Mr. Burges's moulded work, in the case of Skelton telling beautifully in the marble gallery and pulpit.

In conclusion, the lecturer urged the adoption of advice given by Mr. Aitchison recently,—“Decorate up to the presence that fills the house,”—and with regard to a church his hearers would know what that meant. Above all, he said, let the idea of life, and not of pitiful hopelessness or unintelligent meaninglessness,—of freshness and cheerfulness, not of death and doom, breathe from the surroundings of the worshipper. Moreover, let architects study harmony between the worship, ritual, and its place of celebration.

A brief discussion ensued, in which the President (Mr. Aston Webb), Mr. J. A. Gotch, Mr. W. H. Wood, Mr. Stannus, Mr. Sirr, Mr. Cresswell, and Mr. H. W. Pratt took part, and the thanks of the Association were tendered to Mr. Deane for his paper.

#### ARCHITECTURAL ASSOCIATION.

THE last meeting of this Association for the present session was held on Friday, the 2nd inst., Mr. Aston Webb, President, in the chair.

#### The Association Travelling Studentship.

The Chairman announced the result of the competition for the Architectural Association Travelling Studentship. The judges (Messrs. A. W. Blomfield, M.A., H. Walter Lonsdale, and T. H. Batterbury) reported that of the six competitors who had sent in drawings, one was disqualified owing to his drawings being incomplete. After examining the drawings of the remaining five competitors, they had awarded the Studentship to Mr. William Alfred Pite, whose drawings they deemed to be excellent; the second prize (5*l.*) was awarded to Mr. Fredk. H. Tullock; while the drawings submitted by Mr. Arthur Sidney Haynes were placed third.

Mr. E. Eldon Deane then read a paper on “The Influence of Ritual on Church Architecture,” portions of which we print in preceding columns.

Before the meeting closed, the scrutineers of the voting-papers presented their report, in accordance with which the Chairman announced that the following gentlemen had been elected

#### Officers for Session 1882-3.

President.—Mr. Edward G. Hayes.  
Vice-Presidents.—Messrs. Cole A. Adams and R. C. Paga.  
Committee.—Messrs. F. T. Baggallay, A. J. Gale, T. Garratt, J. A. Gotch, E. B. Fanson, C. R. Pink, R. E. Pownall, G. R. Redgrave, H. Stannus, and Aston Webb.  
Treasurer.—Mr. J. Douglass Mathews.  
Assistant-Treasurer.—Mr. Alfred Conder.  
Secretaries.—Messrs. F. E. Eales and W. H. Atkin Berry.  
Librarian.—Mr. H. W. Pratt.  
Assistant Librarians.—Messrs. R. L. Cox and W. Burrell.  
Solicitor.—Mr. Francis Truefitt.  
Auditors.—Messrs. F. H. A. Hardcastle and W. F. Huxley.  
Registrar.—Mr. Thomas H. Watson.

On the motion of Mr. Douglass Mathews, seconded by Mr. F. H. A. Hardcastle, a hearty vote of thanks was given to the retiring President, Mr. Aston Webb, for the very able manner in which he has fulfilled the duties of his office during the past year.

Conversations of “The Institute.”—The President and Council of the Royal Institute of British Architects have issued invitations for a *conversazione*, to be held at the South Kensington Museum on Friday, the 16th inst.



## VANDYCK IN ENGLAND.

AMONG the foreign artistic books of the season, mentioned by us not long since, M. Guiffrey's volume on "Anoine Vandyck" merits certainly a special place, as being the latest and so far the most complete life,—supplying a mass of information, much of which is entirely novel,—of an artist "whose works," as Walpole has well said, "are so frequent in England that the generality of our people can scarce avoid thinking him their countryman." Vandyck's life, indeed, during its most active period, is so associated with the interesting and unfortunate court of Charles I., the houses of our nobility contain so many of the master's portraits,—portraits that went to the homes they at present occupy straight from the easel of the painter,—that Walpole, it must be admitted, was justified in his remark. It has been calculated that there are over 350 portraits by Vandyck existing in our country, and almost all produced in the ten years that preceded his death in 1641.\* It did not require the retrospective exhibitions which of late years have been held, or such works as that of Lord Ronald Gower, to reveal to us the wealth of Vandyck portraits which our nobility own. For two centuries the engravers, both English and foreign, have been busy repeating the graceful beauties and the refined courtesies of English "society" in the first half of the seventeenth century.

Of Van Dyck's life and work, M. Guiffrey's volume may undoubtedly be said to be the most trustworthy source of reference we now possess. Many discoveries have been made since the days of Walpole, of Smith, of Carpenter, and of Waagen. The Belgian writers have not neglected so interesting a study as that of the life of their great countryman; and Italy,—from the study of whose painters he gained so much of his facile powers and brilliant colouring,—with the writers, too, of France, where Vandyck has so many admirers,—have largely contributed to the general stock of information; while the researches of Mr. Sainsbury have thrown much important light on the lives of Rubens and his pupil. The two latest acquisitions to our knowledge of the life of King Charles's court-painter we owe to France, in the volumes of M. Michiels and of M. Guiffrey; but M. Michiels's somewhat too enthusiastic and brilliant work of last season on "Vandyck and his Pupils" is this year almost superseded by the more sedate and appropriate study of M. Guiffrey. In no work yet published on Vandyck could the information here gathered be found arranged in a more methodical manner, or more in accordance with our modern views on the requirements of biography. In addition to the literary and artistic value of the volume, the author has prepared a most invaluable list, or rather *catalogue raisonné*, of the 1,192 pictures by Vandyck which are known to be at present in existence;† this, coupled with an exemplary index, and a large number of well-chosen illustrations, consisting of etchings, phototypes, and woodcuts, certainly constitute M. Guiffrey's volume, a rich acquisition to the artistic literature of the generation. There are still many obscure points to be cleared up in the life of Vandyck, but with the aid of M. Michiels and M. Guiffrey the leading features can now be clearly traced, many details being filled in, thanks to the recent discovery in the library of the Louvre of a long known but never published MS. by an anonymous writer, who, having gathered in the last century in Belgium a mass of information relating to the painter, had, by circumstances now unknown to us, been prevented from printing his intended study.

Into the incidents of Vandyck's early life it is not our intention to enter, although modern research has shown us that the older biographers are singularly incorrect. We see Rubens so far from feeling a jealous rivalry of his young pupil, befriending him in every way, receiving him as an honoured guest at the superb palace in the Place de Meir which the princely painter had built, and where young Vandyck acquired,

amidst the refined existence of his master and the society he gathered about him, his taste for the courtly life for which his grace of person and manner so peculiarly fitted him. It is worthy of notice that Vandyck's first visit to our shores (in 1619) was through his introduction by Rubens to the Countess of Arundel, and the Windsor portrait of James I. is probably of this time. It may further be worth noticing that the story of young Vandyck's escapade at Saventham, which, on the very suspicious authority, we believe, of Houbraken, has been repeated unflinchingly by all subsequent biographers, is now singularly shorn of its somewhat romantic interest. The fascinating young peasant girl of the legend, Vandyck, it would appear, sought in marriage and was refused, the lady, for such she was, dying,—so curiously do long lives connect us with the past,—in 1701, when Queen Anne was on the throne. As for the famous picture of the St. Martin, it was a local commission, a fact which is proved by authentic documents.

Of Vandyck's stay in Italy, important as was its influence on his character and his style of painting,\* its chief connexion with the painter's stay in England may be said to consist in his introduction to the society of the numerous English noblemen who, in accordance with the fashion set by the art-loving Lord Arundel,—whom, by the way, Rubens called "the evangelist of modern art,"—were already commencing to make Rome a fashionable winter resort. Vandyck, while in Rome, indulged to the full his courtly tastes, and the *pittore cavaleresco*, as he was styled, mortally offended his more boorish countrymen and brother painters, who, at the time, formed quite an important colony in the Papal city. His acquaintance with a number of our wealthy and art-loving nobility was, for the rest of his life, to render him anxious to settle down on our shores, though many years were to elapse before he was able to carry out his dream. His return to Antwerp and his want of success, his second visit to London (1627),—a sad failure, for Lord Arundel his patron was out of power (Buckingham being at the moment the favourite),† have all been told before. With his return to his native country success, however, was to visit him; and it was from this active period of his life that he was to be transferred a third time to London, where now a brilliant reception awaited him. Since his last visit the unfortunate Buckingham had fallen and Lord Arundel was in favour. Charles, temporarily relieved from the anxieties of politics by the dissolution of his Parliament, and resting in the calm that preceded the terrible storm of the middle of the century, was free to indulge in his refined tastes, and it was surrounded by a court of artists, cultivated noblemen, and savants, that Vandyck found the king, who was henceforth to be so royal a patron.

Vandyck on his arrival‡ was lodged with one of Lord Arundel's *protégés*, Edward Norgate; the king, however, we have evidence,—Carpenter has printed the original document,—soon entrusted Inigo Jones with the task of providing fit accommodation for the painter. It was no easy matter; the long-disused convent of Blackfriars was, however, found suitable, and here, for the rest of his life, Vandyck lived in a style which his biographers have all dilated upon. The king came constantly to visit him, charmed with the princely manners and the princely life of the master whose portraits he admired without flattery. Vandyck at length had realised his dream. Three months after his arrival (July 5, 1632) he was knighted, the king presenting his favourite painter with a gold chain, which he prized to the last. Vandyck's activity during all this period is astounding; only by the aid of the most skilful pupils could he have possibly produced the number of por-

\* M. Guiffrey has reproduced in his volume a number of most interesting sketches by Vandyck (from the British Museum and the Chatsworth collections), in which the young painter shows how especially he studied Titian; the sketches being very rough (*Esquisse di Tiziano* he called them), but the arrangement of colours is carefully noted by written memoranda.

† On this visit to London Vandyck lodged at his countryman's, Geldorp's, in Drury-lane. Geldorp was keeper of the king's pictures, and at his house used to meet a choice society of "Bohemian" noblemen and artists.

‡ It was to some extent through Endymion Porter that Vandyck owed his call to England. Porter had shown the king an "Armida and Rinaldo," by Vandyck, which so greatly pleased Charles that he immediately invited the painter over. Such was the haste of the artist to reply to the invitation that there is an amusing story of a trick he played on Charles's envoy at Brussels, Balthazar Gerbier, who did not,—the painter thought,—assist his departure as promptly as he considered proper.

traits which we know he painted during these ten last years of his life. Of the king alone, there are in existence seven equestrian and seventeen other portraits; of his queen, Henrietta Maria, there are twenty-five replicas in England, exclusive of the numerous other portraits of the royal pair, or of their children, in the various Continental galleries, at Turin, Dresden, Vienna, Paris, and Florence.

Sitting to the painter, so far from being the "bore" that it is at present the custom to declare it, was, with Vandyck, a fashionable recreation; his *studio*, as we now call it, was the rendezvous of the court. Musicians played to the painter's aristocratic models; the king would constantly pass his morning with the *maestro*. At his table sat down daily a select company of the choicest spirits of the day,—great folk, wits, poets, and musicians. At meal-time the painter would study his model's face, and return, perhaps, later in the day, to his easel; but his usual system was, it would appear, more summary and methodical. On the evidence of Bellori,\* who received his information direct from the lips of Vandyck's intimate friend, Sir Kenelm Digby,—at the time he was envoy of Charles II. at the Papal court, we learn that, with his portraits, he commenced them in the morning very early, working uninterruptedly till breakfast or dinner, to which he would invite his sitters, only too happy to stay for an entertainment of the exceptional nature which the painter was known to provide. After the meal he would set to work again, and in this manner was able to produce two or more pictures in the day, afterwards terminated by his pupils and a few retouches by the master. Such a system was absolutely necessary to meet the exigencies of his numerous sitters. He painted Lord Strafford's portrait no less than ten times, while of his faithful friend, Lord Arundel, there are seven existing portraits. De Piles,† whose informant was the collector, Jabach, who had sat to Vandyck three times, gives us some even more curious information relating to Vandyck's method of producing his portraits. "He never worked more than an hour at a time on each portrait, either sketching it in or finishing it, his clock telling him the hour, when he would rise and bow to his sitters, implying that, for that day, he required them no more. After this, a servant came and changed his brushes and set a new palette, while the painter was receiving a new sitters, with whom he had made an appointment. He thus worked at several portraits in one day. After having rapidly sketched in a portrait in the position which he desired, with black and white chalks, on coarse gray paper, the drawing was reproduced on canvas by his pupils, the dress being painted from the costume sent specially with that view. The hands he copied from models."‡ Well might old Jabach be astonished at the rapidity of the painter, whose care in his earlier days he remembered so well; but when he ventured to remind the *maestro* of the fact, he laughingly informed him that in the past he was working for his reputation, while now he was working for his kitchen.

The extravagances of the painter were indeed great. "And you, Sir Knight," once said to him King Charles turning to his favourite during a conversation in which he had been complaining of the daily-increasing difficulty of raising money, "do you know what it is to want a few thousand pounds?" "Sire," replied the artist, "when one keeps open house to one's friends and open purse to one's mistresses, one soon finds one's coffers empty." The elegant painter whose pictures were so esteemed was indeed what we can imagine from his portraits, "a favourite with the ladies" nor has the busy tongue of scandal spared the reputation of Vandyck. The friendship of Kenelm Digby for the painter is well known. It would appear that Vandyck was a great admirer of the beautiful Lady Venetia, but the scandal that united their names the painter boldly scoured in the well-known allegorical picture he painted (now at

\* Bellori, "Vite de' pittori, scultori ed architetti moderni," &c., 4to., Rome, 1672; to which succeeded several other editions. Bellori was born in 1615, and died in 1686.

† De Piles "Cours de Peinture," Paris, 12mo., 1708; translated into English as "The Principles of Painting," &c., London, 1743; his "Abrégé de la Vie des Peintres" (Paris, 1699), was also translated into English as "The Art of Painting and Lives of the Painters," &c., London, 1706.

‡ That this method was adopted by Vandyck in his later days is curiously proved by the fact that it is only in our English collections,—where the painter's works have remained almost untouched since the day they were sent home,—that these original sketches are to be found.

\* There is an anecdote, not, we believe, well known, of William IV. on being asked, one to contribute to the British Institution, some of his Vandycks, replying that if he was never again troubled to bare his wall for the exhibition he would fill their rooms with Vandycks, which he did. At Windsor alone there are twenty-two Vandycks; the Earl of Clarendon owns twenty-three; the Duke of Bedford seventeen; at Perth there are fifteen; at Blenheim, Wentworth, and Warwick Castle, there are twenty-seven; at Althorp, at Bothwell Castle, at the Duke of Portland's, and elsewhere, there are numerous others.

† Smith's "Catalogue Raisonné" (1831), contained only 344 numbers.



Windsor) of "Calumny and Innocence." Every one who has visited the Dulwich Gallery will remember the beautiful picture by Vandyck of the Lady Venetia stretched on her death-bed, a faded rose,—poetic symbol,—slipping from her fair fingers. There were not wanting those who hinted that Sir Kenelm, who loved his wife to distraction, had in no little measure hastened the end of the beauty by his alchemical preparations to increase her charms. Nor has scandal failed to attach the name of the handsome painter, who, as Sanderson has quaintly put it, was the first "who e'er put ladies' dresses into a careless romance,"—an art which Lely was to continue in the next generation,—with the names of several others of his aristocratic sitters. Of his affection for Lady Stanhope, there is ample documentary evidence,—not of the breach-of-promises character, it is true,—but sufficient to establish the fact. The story of the painter's liaison with the beautiful Marguerite Lemon,—the original of the superb portrait at Hampton Court,—is his rival, and the affection the beauty bore him may, we think, be judged by the heart-broken vexation of the lady on hearing of Vandyck's marriage, at the king's instigation, with Maria Ruthven.

In 1634 Vandyck returned on a visit to his native country. This time he was received with honour, and appointed Dean of the Antwerp Guild of St. Luke; on his return to England it appears that he founded in London a branch guild. All the resident Flemings and his pupils were members of this little society, whose meetings were held at the Rose Tavern in Fleet-street; the registers of the corporation still being in existence, M. Guiffrey states; it would be curious to know what had become of these documents.

On his return to London, after a brilliant visit to Brussels, Vandyck entered on to a fresh period of activity, and for the next few years portrait upon portrait issued from his busy workrooms; but his health was sadly suffering from his excesses. It was the want of money to supply his necessities which in no small measure, it is evident, countenanced the groundless tradition of Vandyck's foolish search after the philosopher's stone. M. Guiffrey says, we think, offered what may be taken as a most satisfactory explanation of this oft-repeated tale, in which the name of Vandyck's friend, Sir Kenelm Digby, has been so long associated, from the fact of his knowledge of chemistry. The death of the painter is, indeed, in no small measure attributed to this cause. Now recent research proves Vandyck, during the last two years of his life, to have been moving backwards and forwards between London, the Low Countries, and Paris; but perhaps the most conclusive evidence against the alleged poverty of the artist,—poverty to supply which he threw himself into alchemical studies,—stands in the will of the painter, by which it can be seen that the fortune he left would in the money of to-day be valued at hard upon 40,000*l*. His extravagances had largely drawn upon his income and ruined his health, but not to the pitch which tradition asserts. But how did the story which is told by Walpole originate? There is a well-known anecdote of Rubens receiving the visit of an alchemist who boasted the possession of the means of acquiring unbounded wealth, but who was politely shown out by the painter with the assurance that he had long since discovered a far surer method. The story told of Rubens would, in all likelihood, as we so often see in biography, become connected with the name of his pupil. Like so many other artists, like Rubens himself, like our own Reynolds, Vandyck attached no small importance to the durability of his pictures, and he studied various preparations of oils, colours, and even canvas-primings with this view. In these experiments he was assisted by a learned doctor at the English court, one Theodore de Mayerne, a chemist, in whose letters mention is found of the inquiries of Vandyck. There is a portrait-sketch in existence of the doctor by the painter. It is easy to imagine how, in an idle moment, some officious intruder may have disturbed Vandyck at his experiments with the worthy chemist, and hence the story of his search for the philosopher's stone has got about. The explanation is worthy of attention were it only for its ingenuity. Artists in the present day are satisfied in their chemical researches with "Roberson's medium," but there are painters who exercise in their hunt for a more occult medium chemical processes that might almost warrant the belief that they were in quest of the philosopher's stone.

Vandyck, as we have said, a year or so previously to his death,—the date is not known,—was married, at the desire of the king, to the beautiful young Maria Ruthven, the original of the charming portrait which Bolswert's brilliant burin has rendered so familiar. The story of the Ruthven family is a romantic one, and M. Michiels has not failed to seize the opportunity to devote a whole chapter to the history of the noble Scottish family, whose misfortunes were certainly touching. But Vandyck's years were counted. We find him, a few months before his death, visiting Paris. In England the political horizon was thickening with the storm that was rising. Vandyck had seen his old friend, Lord Stafford, die on the scaffold, and many of his patrons ruined; he had sought in France a new home, but without success; Fossefin had just returned from his long stay in Italy. Only a short time before Vandyck's death he wrote to M. Chavigny a letter (discovered but a short time since, and published, we believe, for the first time by M. Guiffrey\*), in which there is a and expression of his growing feebleness and desire to return to his house in England,—"Come je me trouve de jour en jour pire, je desirerai en toute diligence de me avancer vers ma maison en Angleterre," and he begs for a passport for himself and five servants, and a carriage and four other servants. This is dated November 16th, 1641. It will be seen in what style he travelled. A few days later, and the painter reached home, dying from the lingering nature of his complaint, leaving him his senses to the last, evidently of a pulmonary nature. The king was deeply affected; the ablest doctors were called in, and a royal reward of 300*l*. offered to any one who could prolong the life of the painter; but his days were numbered. His young wife had the joy of presenting him on the 1st day of December with a little daughter, christened Justiniana. Vandyck gathered his forces sufficiently to make his will, the text of which Carpenter has transcribed from the original still in existence, and we believe at present at Somerset House. On the 9th of December, 1641, Vandyck died, and in accordance with his last wishes was buried at St. Paul's. A pompous funeral was awarded to the painter, who had died in the prime of life,—he was only forty-two years of age. A monument was raised to him near the tomb of John of Gaunt,—a monument representing the Genius of Painting, but in the Great Fire the whole was destroyed, and nothing now marks the tomb of the favourite of King Charles.

He left two daughters; one, Justiniana, who married Sir John Steppney, of Prendergast, the last descendant of the line dying as late as 1825; and a natural daughter, Marie Therese, who died abroad in 1697. His young widow, Maria Ruthven, re-married, but died very shortly afterwards. The assets of the painter, as we should now say, were found difficult to collect, and we learn from a petition made to Parliament by the painter's father-in-law, Patrick Ruthven, that the mass of sketches, drawings, and pictures left by Vandyck at his death had in some manner been purloined and sold by a certain Andrew. It was probably through this source that Sir Peter Lely became possessed of the large number of Vandycks, which at his sale realised so enormous a sum. The famous series, thirty-seven in number, of *grisaille* portraits belonging to the Duke of Buccleugh, came, it will be remembered, from Lely's collection. Of Vandyck's family, his talent, and his possessions there remained, therefore, after his death scarcely a sympathetic item. It was only in his pupils that his traditions were continued, and in them the influence of the Flemish master was great; almost the whole English school, indeed, proceed directly from him, and certainly it is in great part owing to him and Reynolds that our school stands so high in the noble art of portraiture. In that touching scene of Gainsborough's death, when his old rival Reynolds and he met for the first time after years of misunderstanding, Gainsborough's last words were the expression of gratitude that he and Reynolds would meet Vandyck above. Through Vandyck have descended on our school the teachings of Titian,†

\* In reality the letter was first made known in the pages of the "Revue des Documents Historiques"; it was in the collection of Benjamin Fern, and as is present in England, it having been given for it, though only the signature was autograph.

† Among the efforts made we learn that the patient was placed in the smoking attire of a freshly-killed cow.

‡ In Geneva Vandyck had had the rare opportunity of

so nobly continued by those two masters who clasped hands for the last time in the little house in Pall-mall.

## THE PRODUCTION OF STEEL.

Of all the metallurgical industries, the most rapid progress in late years appears to be that of the two forms of steel that are most in demand at the present time,—Bessemer and open-hearth steel. The issue of an elaborate report by the British Iron Trade Association proves fully how great the growth has been, and, put into comparative tables, the extent of the production in the whole of the great districts may be very easily defined. The table below gives the total production for the years, and in the districts named, of Bessemer steel ingots,—the crude form of Bessemer steel:—

	1879.	1881.
	Tons.	Tons.
South Wales .....	235,552	384,656
Sheffield .....	292,223	392,812
North-East Coast .....	74,007	264,986
Lancashire .....	139,063	227,465
Cumberland .....	90,990	162,757
Staffordshire .....	6,242	9,025
Total .....	816,727	1,441,701

We have not the statistics given for so long a period of the production of open-hearth steel, but for last year, and its predecessor, we have official figures, which may be given as under: for the two years, the production of open-hearth steel was as follows:—

	1880.	1881.
	Tons.	Tons.
South Wales .....	116,000	102,000
Scotland .....	84,500	139,500
Sheffield .....	23,500	34,000
Lancashire and Cheshire .....	18,500	24,000
North-East Coast .....	3,500	12,200
Other Districts .....	4,300	6,300
Total .....	251,000	388,000

These two classes of steel include the great bulk of that produced in this country; and it may then be said that, whilst in the year 1878, the total production of the two classes of steel was under one million tons, it rose for the past year to over 1,779,000 tons. And, what is more noticeable, the increase is marked in every district, with one slight exception in each of the two classes. Broadly put, the increase in the Bessemer steel trade represents the increase in the demand for steel for railway purposes; whilst,—though not quite so fully,—that of the increase in the production of open-hearth steel represents the increase in the demand for steel for general purposes. So far as the figures above compiled show, there has been very little movement coastwards of the Bessemer steel trade, for the growth in the production in all the districts, though possibly the north-east coast shows the largest proportionate increase in the years covered. But there may be another cause for this, and for the increase in the South Wales district.

Both the Cleveland and Durham district and that of South Wales were very large producers of iron rails a decade ago. That trade fell off, and it was to be expected that the districts concerned would endeavour to enter into the trade which supplanted it,—that of the production of steel rails. This they have done, and the result is that there has been the large growth in the production of Bessemer steel ingots in the two districts named. And it is in some degree to an allied cause that there is visible the remarkable increase in the production, in one or two districts, of open-hearth steel. On the Clyde that production is now very large, and that in good degree because of the large demands for steel for shipbuilding purposes. As yet it cannot be said that there is much substitution of steel vessels for those of iron, but there is a growth of the steel vessels which would have affected the number of iron ones built had not the "wooden walls of old England" ceased to be built almost entirely. These are amongst the causes of the outgrowth of the steel trade to an extent which is the most remarkable that any similar industry has known in the last few decades. And as the cost of the production of

meeting one of the last relics of the sixteenth century, in the famous Sofonista Anguisciola of Cremona, a blind octogenarian, who had in her youth been painted by the King of Spain. The old lady had gathered about her a court of young artists, and Vandyck was a favourite. She had known Titian, and in later days the painter often admitted how much he had learnt from the aged Sofonista of the technical processes of the great Venetian, whom he himself had taken so completely as a model.



steel by the two methods is being reduced, and there is also a very large extension of the facilities of production, it is by no means improbable that, with a further substitution of steel for iron in more than one of its uses, there may be a very great growth of the manufacture; whilst the largeness of the dependence upon foreign trade and upon the shipbuilders for such a demand would probably tend to the movement of the steel trade to the coast, of which of late there has been so much said and written.

### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

#### MEDALS AND PRIZES.

The last meeting of this Institute for Session 1881-82 was held on Monday evening last, Mr. Horace Jones, President, in the chair. There was a much smaller attendance than is usual on the occasion of the presentation of the Royal Gold Medal and other prizes; but the fact that the meeting was announced as a "business meeting" may be to some extent accountable for this.

The following gentlemen were balloted for and duly elected, viz.,—*As Fellows*: Messrs. E. Swinfen Harris, J. Treadway Hanson, Alexander Payne (Associate), Henry Cowell Boyes (Associate), W. G. Bower, and Herbert Spurrell. *As Associates*: Messrs. W. H. Marple Ward and Alexander Pope. (The last-named gentleman, having passed the Obligatory Architectural Examination, is entitled to the designation of Graduate of the Royal Institute of British Architects.)

#### The Sharpe Memorial.

Mr. F. C. Penrose said he had the honour to be delegated, by the President and members of the Architectural Association, to present to the Institute for its library the work which had just been issued under the auspices of the Association as a memorial of the late Mr. Edmund Sharpe. Mr. Sharpe was so well known in the Institute that it was not necessary on the present occasion to say much in his praise, but he was a man whom all who knew him loved and venerated. For the last few years of his life he was in the habit of annually leading a party of the members of the Association on some architectural excursion. These excursions were at first confined to England, a different district being taken every year, but the two last excursions led by Mr. Sharpe were to France. The last excursion which he directed was in the autumn of 1875 to a district near Angoulême, in the Département de Charente,—a district peculiarly rich in churches of a particularly grand yet extremely simple character, including some domical churches, to which Professor Donaldson had drawn the attention of the Institute some years ago. The way in which the work had been executed was a credit to the Architectural Association, on whose behalf he had much pleasure in presenting a copy of it for the Institute library.

Mr. Ewan Christian moved a vote of thanks to the donors, observing that the illustrations with which the work abounded were admirably executed. It was a melancholy satisfaction to have so excellent a memorial of so worthy a man. Many years ago he (the speaker) had derived much assistance from the knowledge possessed by Mr. Sharpe with regard to Southwell Minster and other buildings, and it was to be regretted that the Association had lost so able, so genial, and so painstaking a leader for their excursions as Mr. Sharpe proved himself to be. He was glad to hear that the excursions were continued, even though they had lost their great leader.

Mr. Hansard, in seconding the motion for a vote of thanks, said that while the Institute was grateful for the book on account of the value of the work itself, they had peculiar pleasure in accepting it as a gift from the Architectural Association.

In reply to a question by Mr. Charles Barry, as to whether the work had been published at the expense of the Association,

Mr. Phéné Spiers explained that it had been Mr. Sharpe's intention to publish a work on the Churches of the Charente, and nearly all the drawings contained in the volume now published were made by the excursionists for Mr. Sharpe, who died before any of them could be reproduced by photo-lithography. Mr. Sharpe had been so great and valued a friend to the Association that the question naturally arose, as to the best way in which the members could

commemorate his services to them, and it was resolved, after much consideration, to carry out to completion Mr. Sharpe's intention as to a volume illustrating and describing the churches of the Charente. The work had been published by subscription, subscribers being at first confined to members of the Association, but ultimately the subscription-list was thrown open to the members of the Institute. It was believed that in publishing this work the Association had shown their appreciation of Mr. Sharpe's kindness to them in the way which he would have preferred above all others, and they were confirmed in that view by the opinions which had been expressed by the members of Mr. Sharpe's family. The volume now given to the Institute library had in reality been presented by the subscribers to the Association, who in turn presented it to the Institute.

The Chairman, in putting the motion, said the Association had not only produced a very charming work, but they had produced a worthy memorial of a good man.

#### The Royal Gold Medal.

The Secretary read two letters from Baron von Ferstel, whose nomination by the Institute as this year's recipient of the royal gold medal has, as already announced, been graciously approved by her Majesty the Queen. Baron von Ferstel expressed his regret at his inability to attend to receive the medal, the award of which to him he could not but esteem as a very great honour. A letter was also received from the Austro-Hungarian Embassy, stating that Herr Constantine Dumba, an *attaché* of the Embassy, would present himself to receive the medal; but, instead, Baron Wacken, Secretary to the Embassy, attended for that purpose.

Date.	Description of Works carried out by Baron von Ferstel.	Place.	Style.
1856-1879	Church of Dedication (the Votive Church)...	Vienna.	Gothic.
1856-1860	Bank and Exchange Buildings (Bourse) .....	"	Early Renaissance.
1863-1867	Evangelical Church .....	Brunn.	Gothic.
1843-1877	Roman Catholic Church .....	Tepitz.	"
1863-1868	Palace of the Archduke Ludwig Victor .....	Vienna.	Renaissance.
1863-1865	Palace of the Baron von Wertheim .....	"	"
1865	Restoration of the Grop Skal Castle .....	Bohemia.	Gothic.
in construction.	Imperial and Royal Austrian Museum of Arts and Industry .....	Vienna.	Renaissance.
1868-1871	Chemical Laboratory of the University .....	"	"
1869-1871	Imperial and Royal Government Gymnasium in the IX. District .....	"	"
1869-1872	Villa of the Archduke Carl Ludwig .....	Reichenau.	"
1870-1872	Imperial and Royal Central Meteorological Establishment, high Observatory .....	Vienna.	"
1871-1879	Restoration of the Church of St. Jacob .....	Brunn.	Gothic.
1873	Main Building of the University .....	Vienna.	Renaissance.
in construction.	School of Arts and Industry of the Imperial and Royal Austrian Museum .....	"	"
1874-1877	Palace of the Prince Johannes Leichtenstein .....	"	"
1878-1879	Vicarage for the Church of Dedication .....	"	"
1879-1881	Villa of the Archduke Ludwig Victor .....	Salzburg.	"
1879-1881	Rebuilding of the Evangelical Church .....	Bielitz.	Gothic.
1880	Administration Offices of the Austrian-Hungarian Lloyd .....	Trieste.	Renaissance.
in construction.	Great Altar of the Parish Church .....	Vienna.	"
1881	" Schotten " .....	"	"
in construction.	Rich Altar Work of Marble and Mosaic .....	"	"

The presentation of the Royal Gold Medal to the representative of Baron von Ferstel, Hon. and Corr. Member, was then made by the President, who spoke as follows:—Gentlemen,—It is now thirty-five years ago since her most gracious Majesty, modifying the original terms of the gift, was pleased to command a Royal Medal to be confided to us for the purpose of annually awarding it to some eminent person, architect or man of science, engaged in aiding and promoting the study and practice of architecture, and to-night we meet to present it to the thirty-fifth recipient.

This Royal Medal, gentlemen, has been widely distributed, and it has by no means been confined to the subjects of her Majesty; indeed, I find that there have been six French gentlemen, three German gentlemen, one Austrian, and one Italian gentleman, to whom it has been given at different periods, and that there are at present living only six English architects who possess it. Of the foreigners,—eleven in number,—four medals, as I have mentioned, have fallen to the honour of the German nations, and to-night we shall have the pleasure of handing to the representative of the fifth, Baron von Ferstel, of Vienna, the medal for this year. The four distinguished men of his own country who preceded him were the Chevalier von

Klenze, who did so much and such admirable work in Munich; August Stüler, who practised in Berlin, and whose works many of us know; Herr Lepsius, the celebrated author and archaeologist; and Professor Schmidt, of Vienna. I may add that these gentlemen, whose works we all of us admire, will have their reputation in no degree diminished, in the eyes of the world, by having the name of von Ferstel added to their number.

I will ask the secretary to read to you the titles, honours, and a list of the principal works of Baron von Ferstel, and I trust that this honour, though perhaps the latest, will not be the least among those which the many works executed by him during the last twenty-eight years have earned for him, not only in the consideration of his own countrymen but, of Europe at large.

The secretary accordingly read the following particulars of Baron von Ferstel's honours and works, viz.,:—

Heinrich Freiherr (Baron) von Ferstel, Hon. and Corr. Member, Imperial and Royal Principal Architectural Councillor and Professor of the Imperial and Royal Technical High School of Vienna, Knight of the Order of the Iron Crown of the Second Class, and of the Austrian Order of Francis Joseph, Officer of the French Order of the Legion of Honour, and of the Imperial Mexican Guadalupe Order, Knight of the Royal Bavarian Order of Maximilian for Science and Art, and of the Royal Bavarian Order of Michael of the First Class, Honorary Citizen of Vienna and Brunn, Trustee to the Imperial and Royal Austrian Museum, Foreign Associate of the Institute of France, Honorary Member of the American Institute of Architects, of the Academies of Brussels, Amsterdam, Munich, and Rome, Member of the Imperial Academy of Fine Arts of Vienna, and of the Imperial Academy of Berlin, &c., &c.

The construction of the foregoing twenty-one works has cost more than eighteen millions of florins.

The great number of dwelling-houses and country seats, as well as small churches and schools, which have been constructed at a cost of about six millions, do not appear in the foregoing list. In like manner, no account has been taken of numerous plans for buildings which have not been put into execution.

The President,—What you have heard from the secretary will, I am sure, insure your appreciation of the care that the Council has bestowed on the selection of Baron von Ferstel as the recipient of this medal this year. I regret that he is unable to be in England at this time. It is always a pleasure to see and know architects and colleagues who have distinguished themselves so worthily and so much as Baron von Ferstel. It is a pleasure to see their bodily presentment and faces, an honour to us to grasp their hands in friendly and honest admiration of their character and in recognition of their worth. Though I should have desired to do this personally, I nevertheless have very great pleasure in handing to Baron Wacken, here present on behalf of his distinguished countryman, the Royal Gold Medal for the year 1882, the gift of the Queen to Baron von Ferstel, to whom we all wish health, long life and happiness.

Baron Wacken, speaking in French, said that



at the last moment he had been requested to present himself at the meeting on behalf of his countryman, and before all things he wished to express Baron von Ferstel's acknowledgments for the honour conferred upon him. He had been struck with the practical character of the edifices, both public and private, erected in this country. He thought that the President would agree with him in bearing witness to the great progress effected of late years in German Architecture. He was sure that the distinction with which Baron von Ferstel was honoured by his English colleagues would be appreciated both in Austria and Germany, particularly as it had been made by the august Sovereign of this Kingdom, on the recommendation of the Royal Institute of British Architects, to whose members, collectively and individually, the Baron addressed his thanks in the name of Baron von Ferstel.

The presentation of the other medals, prizes, and certificates was made by the President. The Sharpe Prize of Books was awarded to Mr. J. Atwood Slater, who was second in the competition for the Pugin Travelling Studentship. A Certificate of Honour was awarded to Mr. Henry Hardie Kemp, who was third in the same competition. A Medal of Merit was awarded to Mr. Leonard Stokes, Associate, who was placed second by the judges in the contest for the Soane Medallion. In the same competition a Certificate of Honour was awarded to Mr. G. H. Shackle. The Grisell Gold Medal was awarded to Mr. H. Phelps Drew, for his design for a stone bridge. The Institute Silver Medal and ten Guinea were awarded to Thomas T. Scott, Associate, for his drawings of St. David's Cathedral. In the same competition a Certificate of Honour was awarded to Mr. Roger Elsey Smith.

The public proceedings of the meeting then terminated.

*The Affairs of the Institute: By-laws XLVI, LV, LVI, &c.*

Mr. Edmund Woodthorpe having brought forward the motion, of which he had given previous notice, moved, and Mr. C. Forster Hayward, F.S.A., seconded—"That the attention of the Institute be called to the fact that it is very undesirable for a paid officer to have the power of voting at the meetings of the Council, also that the President and Council are requested to report to the Institute the necessary steps required to carry such resolution into effect."

The subsequent speakers were Messrs. Henry Dawson, Charles Barry, F.S.A., Wyatt Papworth, J. Macvicar Anderson, Professor Kerr, Professor Roger Smith, Mr. Robert Walker, and Mr. Thomas Blashill. On the suggestion of the last-named, a modification, accepted by the proposer and seconder, was made in the wording of the motion, which was carried in the following terms:—"The attention of the Institute was invited to the fact that a paid officer has at present a vote on the Council as member thereof, and the Council is asked to consider the subject and report to the Institute. The meeting then adjourned."

#### BAD BUILDING IN LEYTON AND LEYTONSTONE.

A RAID has just been made on a number of houses in course of erection in Leyton and Leytonstone, and a stop put to their further progress. This has been brought about by the action of Mr. Dawson, the newly-appointed Surveyor to the Local Board. In making a tour of the district he has discovered that, out of a number of houses now in course of erection, no fewer than 150 are in contravention of the by-laws. He found that the mortar being used was almost entirely composed of mud, and these facts having been reported to the Board, the sanitary committee took the matter in hand, and, in looking over the plans for other new houses and shops proposed to be erected, they found that, out of 162 of these proposed new buildings, only seven were in conformity with the by-laws. The remaining 155 were, therefore, not allowed to be proceeded with; whilst, as respects the first-named 150, pure mortar has been insisted upon under a threat of the works being stopped.

**The British Archaeological Association.** The Council of this Association are sending out cards for a *conversations* at the Suffolk-street Galleries on Tuesday, the 4th of July.

#### HORSE POWER, STEAM POWER, AND ELECTRIC POWER FOR TRAMWAYS.

WHILE the contest for the championship of the cricket-field between England and Australia has filled many an attentive mind, another race has come off in Paris, known to us by its upshot alone, as mentioned in our last number. For as much as five years the struggle between horse power and steam power for traction has been carried on in Paris. Twelve of the Hughes locomotives were constructed for the use of the Southern Tramways of Paris, and the cost, of working, according to Mr. D. K. Clark, came to about 1'66d. per mile per ton of gross load. In February, 1880, however, the contract expired, and horse traction was resumed. We have recently announced that on the last of the three routes on which steam was employed the horses have returned to work. We pointed out on the 15th of April (*ante*, p. 441), the limit of that margin of economy which would reward the successful replacement of the locomotive. But the constructors of tramways, whether worked by horse or by mechanical power, are on a very different plane from that occupied by the constructor of a railway. People are too apt to overlook the limit imposed by nature herself on the economy to be effected by tramways, or light and ill-graded railways of any description. It is extraordinary to see, in some of the estimates made for road tramways or road railways, in France and in Italy, how little attention has been paid to the limit of the economy which it is possible to effect by reducing road friction to its minimum. On a railway in perfect order the resistance of running friction is about one-sixth of the like resistance on a road in perfect order. There is room for saying, but it is of a distinct and definite amount. It is about 37·5 lb. per ton,—a considerable item,—on the level. How is it when we come to an incline of one in twenty-five, which is by no means steep for a road? Then the resistance on a good road is 134·6 lb., and that on a railway 97·1 lb. In the first instance, the saving is five times the resistance; in the second instance, it is not quite a quarter of the resistance. Thus the inclination of the ground plays so important a part in the economy to be effected by a tramway, that in any sound investigation of the merits of a new scheme it should be put in the very fore front of the data to be collected.

So much as to the road. There is a limiting gradient, on attaining which the saving possible in friction becomes so small a part of the total resistance, that it is not worth while to encounter much expense to effect it. Mr. Robert Stephenson laid down the London and Birmingham Railway on the principle that this limit was attained when the resistance of gravity equalled that of friction; that is to say, at 16 ft. per mile, or 1 in 330. Gradients of 1 in 100 were introduced by Mr. Brunel for short lengths, and occur on the Great Northern and other railways. The power that will take a train of 175 tons at 25 miles an hour on a level will only take 76·6 tons at the same speed up an incline of 1 in 100; and even on slackening the speed to 10 miles an hour it will only take a train of 87·5 tons. Of course, impetus goes for much, as in a coach, for a dash up an incline; but the above are the definite resistances, supposing the train to start without impetus. It is evident that to maintain a given running speed the steam-producing power, and thus the weight of the locomotive, and the strength of the way and works, must increase in a corresponding ratio, and thus cost is augmented all round. This is the true objection to steep inclines.

Again, as to motor power. It is probably in the future that we shall attain such a command of small motor power as materially to alter the present condition of the economical problem. But, dealing with it as it at present exists, two conditions are requisite to make steam propulsion pay. One is that there shall be a sufficient volume of traffic; the other, that the transport shall be conducted at a certain speed. Without endeavouring now to lay down any hard-and-fast lines on this matter, it is obvious that the volume of tramway traffic is rarely such as to be satisfactory in this respect, and the speed still less so. Very elaborate calculations as to railway working lead to the result that, taking the cost of propelling 100 tons for one mile, at the speed of thirty miles an hour, at 20'5d., the cost of propelling the same weight at five miles an hour will be 34'5d. But this is assuming

that in each case the train is so proportioned as to allow the engine to do its full work. And in the latter case the time occupied is sixfold, so that the earning capacity of the line will be diminished to one-sixth. We have here indicated some of those considerations that explain why it should cost 16d. to do on a tramway what it costs 2d. to do on a railway, and two-thirds of a 1d. to do on a canal, and why steam power rarely can pay on the first.

It is in the direction of the use of electric power by accumulating batteries that we think the best prospect of mechanical tramway working at present offers itself. It is well known to be the fact that it is the strain of starting the cars that most tries the horses, and that, in fact, makes the horse-power so costly. We venture to anticipate that the most successful mode of tramway working which at the present time is attainable is the use of horse traction, supplemented by a starting force to be supplied by an accumulator, which might also receive the force otherwise wasted in stopping. Without prejudice to further improvements hereafter, we think there is room for a great economy here, even in our present state of scientific knowledge.

#### THE COMPOSITION OF CEMENT UNDER THE MICROSCOPE.

At the sitting of the Paris Academy on March 22, 1882, a paper on this subject was presented by M. Dauré on behalf of M. H. Le Chatellier, which we translate here on account of the light it throws on the composition of cement. The author says:—"During the past year I have carried on a series of experimental investigations on the composition of slowly-setting cements, so-called Portland cements, and on the theory of their hardening. As I am temporarily compelled to interrupt those investigations, I give here the results obtained up to the present time, although they are not yet complete. If we examine under the polarisation microscope a thin slip cut out of the vitrified slag as it comes out of the Portland cement kiln, we notice chemical substances distinctly different in their character. I tried to determine their nature by comparing their optical characteristics with those of artificially produced lime combinations. The substances offering the most striking characteristics are the following:—

1. A substance which has no effect upon polarised light. It consists of aluminate of lime rich in lime, and sometimes mixed with free lime. I have, indeed, produced the three basic aluminates of lime,  $Al_2O_3 \cdot 3CaO$ , and shown that it crystallises in the tesseral, consequently polarically inactive system. I have also proved that this is the only aluminate of lime combination which crystallises in this system.

2. A substance which has a slight effect upon polarised light, and shows very neat crystalline forms. This is a silicate of lime. I recognise in this the principal, if not the only effective, element in cement. This substance always forms the greatest part, and sometimes even exclusively the whole mass, of cement. I think I am able to affirm that it is a lime peroxide (lime olive),  $SiO_2 \cdot 2CaO$ , which forms during burning, and is melted in the following substance and then crystallises.

3. A substance coloured intensely brown, and affecting polarised light. This is the most easily melted substance contained in cement; in a solid state it forms the base and in the melted condition the matrix for the crystallisation. It is a ferro-aluminate of lime. I have given it the formula of  $2(AlFe)_2O_3 \cdot 3CaO$ . I have produced directly the combination corresponding to this formula, and found in it both the optical properties and the easy fusibility of the element contained in cement. This substance changes very easily in water.

4. Small crystals, which act very energetically upon polarised light. They are of less frequent occurrence, and show no change in contact with water. They are probably combinations of magnesia, for I have observed that all strongly basic combinations of lime are easily decomposed in water, in contrast to combinations of magnesia.

The principal elements of cement are, therefore, in the first place, a peroxide of lime ( $SiO_2 \cdot 2CaO$ ); in the second place, one or more aluminates and ferrates of lime. The existence of crystallised aluminates of lime in



cement has been already noticed by Frémy, the labours of which formed the starting-point of my observations. As regards the successive phenomena during the hardening process of cement, I have been able to ascertain the following in the microscope under polarised light. Several combinations are produced by the operation of water. That which plays the principal part during hardening crystallises in hexagonal scales, which may correspond to hydrate of lime. I have hitherto been unable to collect sufficiently large quantities for determining directly the composition. No doubt it is a product of the decomposition of peridote of lime. Indeed, it occurs much more frequently in those cements which contain this silicate exclusively, and in alumina. There are also formed, but only in cements containing alumina, long needles, which intertwine with each other in all directions, like felt, and the proportion of which in the mass increases considerably in quickly-setting cements. These crystals lose water in dry air, being reduced in bulk at the same time; heated in water over 50° C, they break up, and are changed to dust. They originate in the operation of water upon the three-basic aluminate, as I have shown in the case of those directly produced aluminates. I have further ascertained that the body  $Al_2O_3 \cdot 3CaO$  is decomposed in pure water, in the proportion of 0.3 gramme per litre, while in salt water a much larger quantity is dissolved, but only partly decomposed.

These observations explain the ascertained differences which appear in practice between slowly and quickly setting cements. Quickly binding cements are always richer in alumina. I have also recognised the formation of other substances during the hardening of cements, which do not affect polarised light, but I was unable to determine them, either with regard to their composition or with respect to the part which they play in hardening. Peridote of lime ( $SiO_2 \cdot 2CaO$ ) has another curious property, which may supply the key to a frequently recurring phenomenon in cement manufactories. Heated to the softening point, —i.e., to the melting temperature of soft iron, —and then quickly cooled, it forms at first semi-transparent pieces of the hardness of stone; the mass is then decomposed, and finally falls into an impalpable dust, consisting of crystal fragments, which formed originally an exceedingly fine network. The inequality of expansion of the surfaces, brought into tension by the network, is no doubt the cause of this breaking up. But if crystallisation is effected in a lower temperature, the net-like crystals are not formed, and no breaking up takes place during cooling.

#### THE CHANNEL TUNNEL.

A PARAGRAPH has just appeared in the daily papers on the subject of the Channel Tunnel, which very strongly points in the direction of the views we have repeatedly expressed, to the effect that Nature will take the project in her own hands. "No boring is done during the night now, but the time is employed in emptying the sumps of the water which has been collected in them during the day, and in preparing for the next day's work." The last account told us that the heading was perfectly dry, and as we are now informed that "no material change takes place in the character of the stratum through which the Channel Tunnel heading is being bored," we should like to know how the sumps get full of water. "The soundings are to be continued to a depth of 40 ft." As the heading is at a depth of 170 ft. already, and in the grey chalk, it would be instructive to know the reason of a further penetration of that bed. "The water is still a great deal of trouble in No. 3 shaft in the east side of Shakespeare's Cliff, and prevents the work being carried on very fast," —which was the original anticipation of the Builder.

**New Bank, Hereford.**—The Worcester City and County Banking Company, having recently acquired an old building in a central position in the city of Hereford, have selected Mr. E. H. Lingens Barker, of London and Hereford, to plan and superintend the necessary alterations and repairs, which are to be of an extensive character. The competition was restricted to half a dozen architects from London and the West of England, selected for their special experience in dealing with works of this kind, and no competition plans were prepared.

#### THE DOOM OF HOLYWELL-STREET.

##### A RETROSPECT.

"HOLYWELL-STREET, Strand. A narrow, dirty lane extending parallel with the Strand from St. Clement's Danes to St. Mary-le-Strand, occupied chiefly by old clothesmen and the vendors of low publications." So wrote Peter Cunningham, and truly, in 1849. The street had then become so disreputable that its name was a synonym for immorality. Of late years its character has been improving, and it would much like, by adopting the name of Booksellers'-row, to efface the memories of its antecedents. Be its character what it may, yet, as in bygone days, the street is still "a narrow, inconvenient avenue of old ill-formed houses." Somewhat like Canning's Needy Knife-grinder, the street has hardly any story to tell. It is generally supposed that it derived its name from some holy well or other in the neighbourhood. Stow, quoting Fitzstephen, says, "There are near London, on the north side, special wells in the suburbs, sweet, wholesome, and clear, among which, Holy Well, Clerk's Well, and Clement's Well are most famous and frequented by scholars and youths of the City in summer evenings when they walk forth to take the air." "Holy Well," Stow adds, "is much decayed and spoiled with filthiness purposely laid there, for the heightening of the ground for garden plots." This latter well gave its name to Holywell, now High-street, Shoreditch, on the west side of which stood a Benedictine Nunnery of St. John the Baptist, called Holywell. Northcote, Pennant, and Malcolm make no mention, in reference to the tributaries of the Strand, of Holy Well. Mr. Parry, one of the oldest parishioners of St. Clement's, informed Mr. Diprose that the Holy Well was situated under the Old Dog Tavern in Holywell-street; and John Timbs makes a similar statement in his "Curiosities of London." Eliza Cook, with, of course, poetic licence, sings:—

"They say, three hundred years ago  
The cold, pure water used to flow  
From a gurgling fount with trees around,  
Where 'The Old Dog' tavern may now be found.  
They say it was a wondrous spot,  
And the 'Chronicles' kept it unforgot;  
For the pages of history often dwell  
On the storied fame of the 'Holy Well.'"

"They say." Who say? There is, however, no doubt about the existence of "The Dog Tavern." It was long famous for its quiet, good dinners, and was recommended by the author of "The Art of Living in London" (1760). Diprose, in his "Account" of the parish of St. Clement's Danes, writes:—"We remember, many years ago, Mr. Dormer, of 'Dolly's Chop House,' taking this house [The Dog] with a view of supplying its frequenters with the pure water of the holy well." On this follows, "Other inhabitants believe the ancient relic was adjacent to Lyon's Inn," and in another part of the volume Mr. Diprose, speaking for himself, "Upon examination we find that there is no reason for supposing the Holy Well was under the Old Dog Tavern." This hostelry which, forty-four years ago, was advertised as having "been established upwards of 200 years," is now but a memory. When the scheme of the "Strand Hotel Company" sprang into existence the tavern was doomed. To March, 1884, its materials and fixtures were sold. In this sale also all that was left of Lyon's Inn was swept away. "Lyon's Inn was a guest inn or hostelry, held at the sign of the Lyon, and purchased by gentlemen professors and students in the law in the reign of King Henry the Eighth, and converted into an inn of chancery." Cowper the poet declined the deputy readership of this inn. He writes to a friend, "Notwithstanding it is so agreeable a thing to read law lectures to the students of Lyon's Inn, especially to the reader himself, I must beg leave to waive it" (Nov. 8, 1765).

Lyon's Inn Hall deserves to be remembered by the architectural profession, inasmuch as it was for many years the meeting-place of the Architectural Association, —a body now so flourishing and vigorous that it has probably far exceeded the most sanguine anticipations of its founders in strength and usefulness.

Lyon's Inn was gradually deserted by the men of law and became a motley haunt of good, bad, and indifferent characters. Then came the murder of William Weare, of No. 2, Lyon's Inn, an event which deepened the shadows of its already shady character. The rickety inn became a sort of no-man's-land. For some years previously,

and up to the disposal of its site to the "Strand Hotel Company," the dreary patch of desolation, —called by courtesy a square, —the Inn and its tumbledown staircase passed, no one knew how, into the keeping of an old woman who combined washing with charring, scrubbing the clothes in the hall, and drying them in the cloisters. The financial failure of the Hotel Company before its building was half way up resulted in inflicting a wretched eyesore upon the neighbourhood for some years. The unfinished building was allowed to become all but a ruin, when it was resolved to turn the Holywell-street and Wych-street façades into shops. Later on, the space between the two rows of shops was utilised for the sites of two theatres, —the Globe, and the Opera Comique. These two theatres have their stages abutting upon each other, a party-wall, of course, intervening. The Opera Comique has an entrance from the Strand, although that theatre is situate, as we have said, between Holywell-street and Wych-street. The entrance from the Strand communicates with a subway leading beneath Holywell-street to the theatre. With the disappearance of the tavern and the inn, the romance of the street passed away. There can be hardly a doubt that the street derived its name from the holy well of St. Clement's, which had existed for ages in Clement's-lane. When the Strand end of this ancient thoroughfare was cleared away to make room for the Courts of Justice the well was rediscovered, its waters flowing Thamesward as "sweet, wholesome, and clear," as when Fitzstephen drank of them 700 years ago.

A number of ratepayers who have formed themselves into an association for the improvement of the Strand are exerting themselves towards the removal of the buildings between Holywell-street and the Strand to make way for the increase of traffic in the latter street, which will ensue on the completion of the Law Courts.

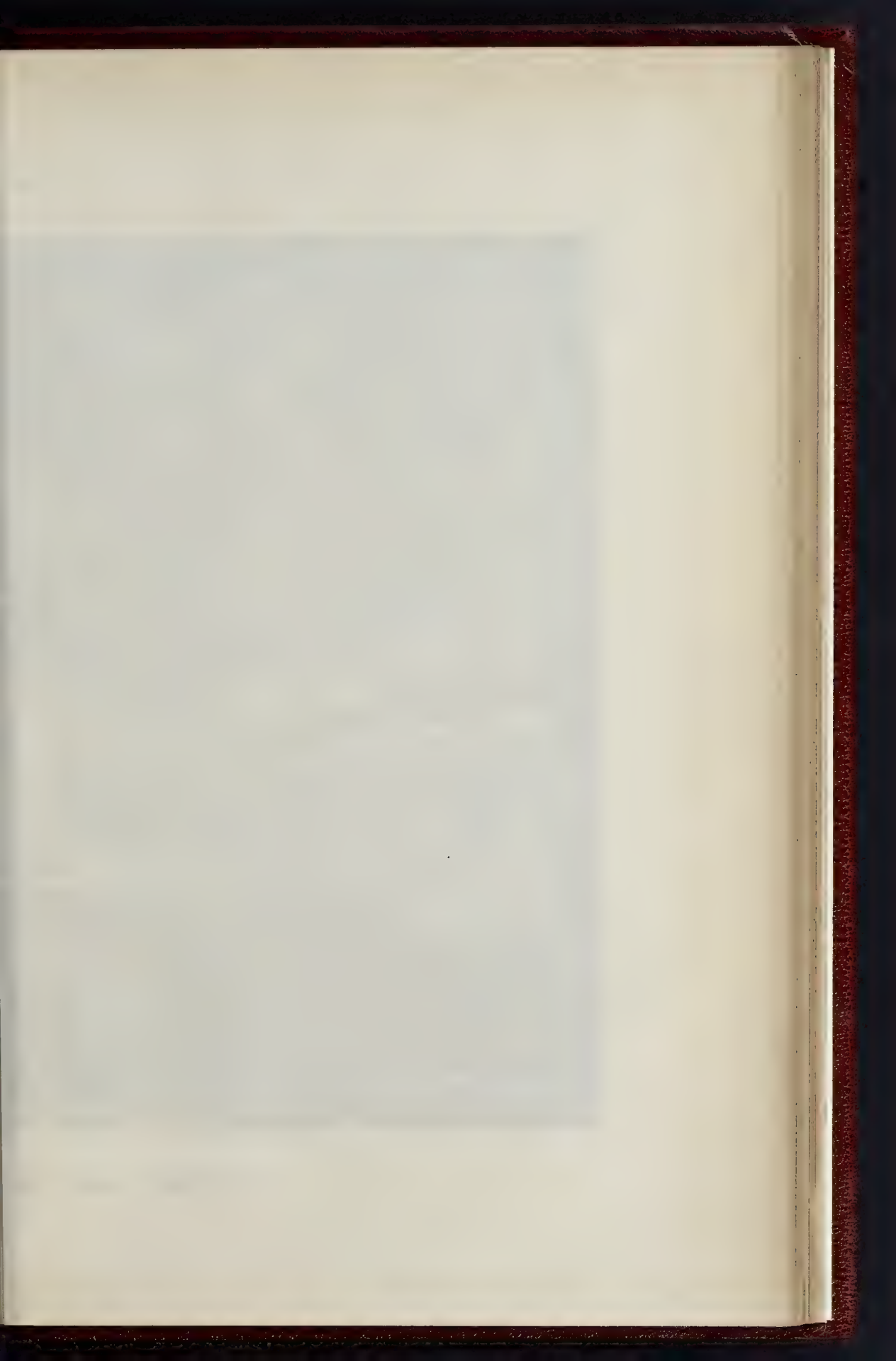
This same association is endeavouring to bring about the demolition of the cluster of festering slums which lie in a corner formed by King's College Hospital, the Courts of Justice, and Clement's Inn. Gilbert-street, the only remaining portion of the upper part of Clement's-lane, presents a striking picture of poverty and dirt. Yet Clement's-lane was once the "Bond-street" of extra-mural London, and the memories of Oliver Cromwell, of Charles II. and his gay courtiers, of Dryden and Bolingbroke and Steele, and many other notables, linger round the neighbourhood.

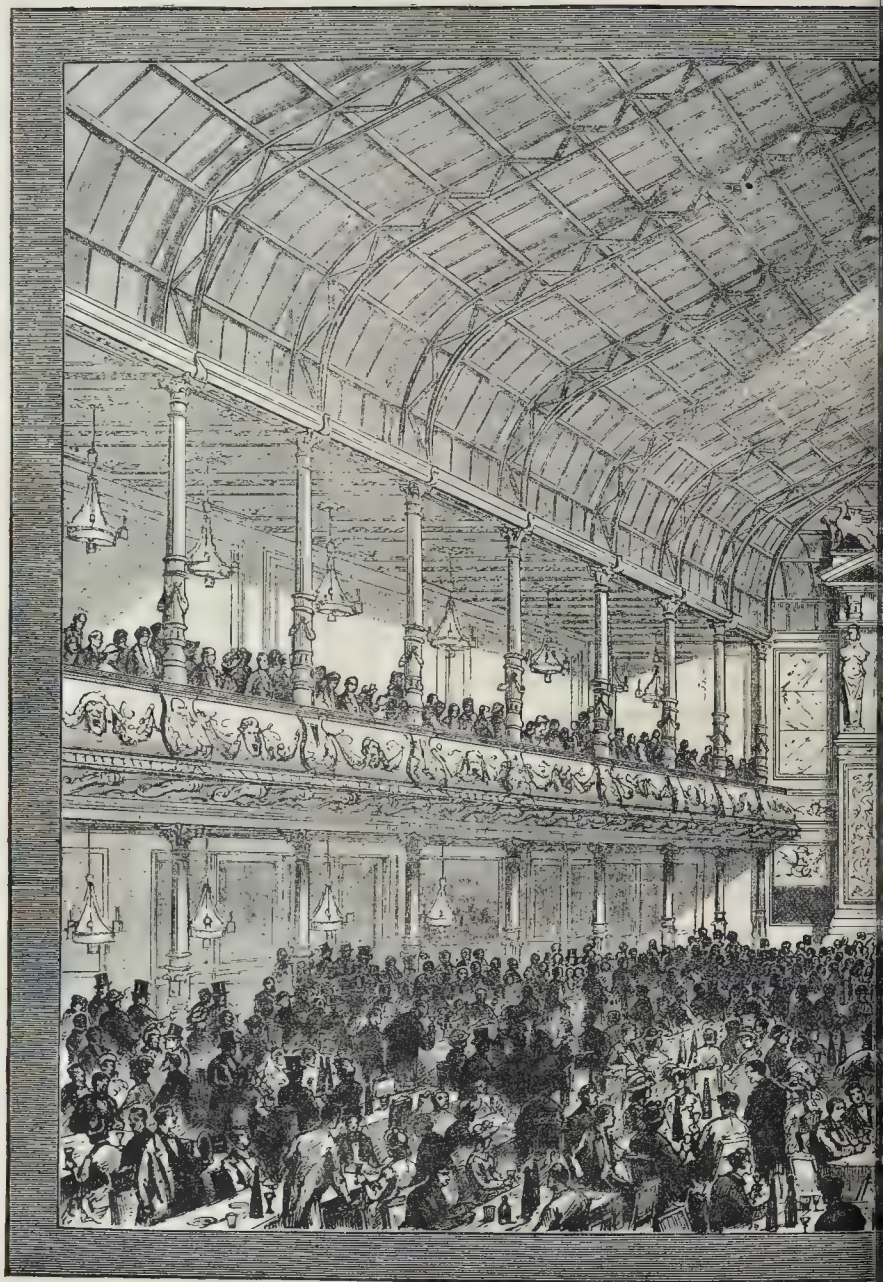
#### A FREE LIBRARY FOR NEWARK.

ON Whit Monday, Mr. William Gilstrap, of Farnham Park, near Bury St. Edmunds, laid the foundation-stone of the Free Library which he has determined to build and present to his native town, Newark. The work has been entrusted to Mr. Wm. Henman, architect, of Waterloo-street, Birmingham. The site selected is a portion of the Cattle Market in Castlegate, and the new buildings will be backed by the picturesque ruins of Newark Castle; consequently they have been designed in a style to harmonise therewith, and will be faced entirely with stone. The principal entrance is in the centre of the front. A few steps lead up to a central hall, and, facing the entrance, is the indicator-screen and counter, at the other side of which is the lending library (30 ft. by 20 ft.) and librarian's private room adjoining. To the right of the hall is the general reading-room (40 ft. by 20 ft.) and reference reading-room divided therefrom by an ornamental screen (20 ft. by 13 ft.). To the left of the hall is a ladies' reading-room (25 ft. by 16 ft.). The positions of the various rooms permit of easy supervision by the Librarian while attending to his duties in the lending library. All parts of the building will be well lighted by large mullioned windows, and the whole will be furnished in a suitable manner, stored with books, and endowed by Mr. Gilstrap, as a gift to his native town.

**Abbey Park, Leicester.**—In our notice of the above works, the name of Mr. J. Gordon, the present head of the Borough Engineering Department, during whose term of office the works have been brought to a satisfactory conclusion, should have been mentioned. The public decorations and the arrangements for the public safety on the occasion of the Royal visit were successfully carried out under Mr. Gordon's direction.







THE NEW "CRYSTAL PALACE" OF LEIPZIG

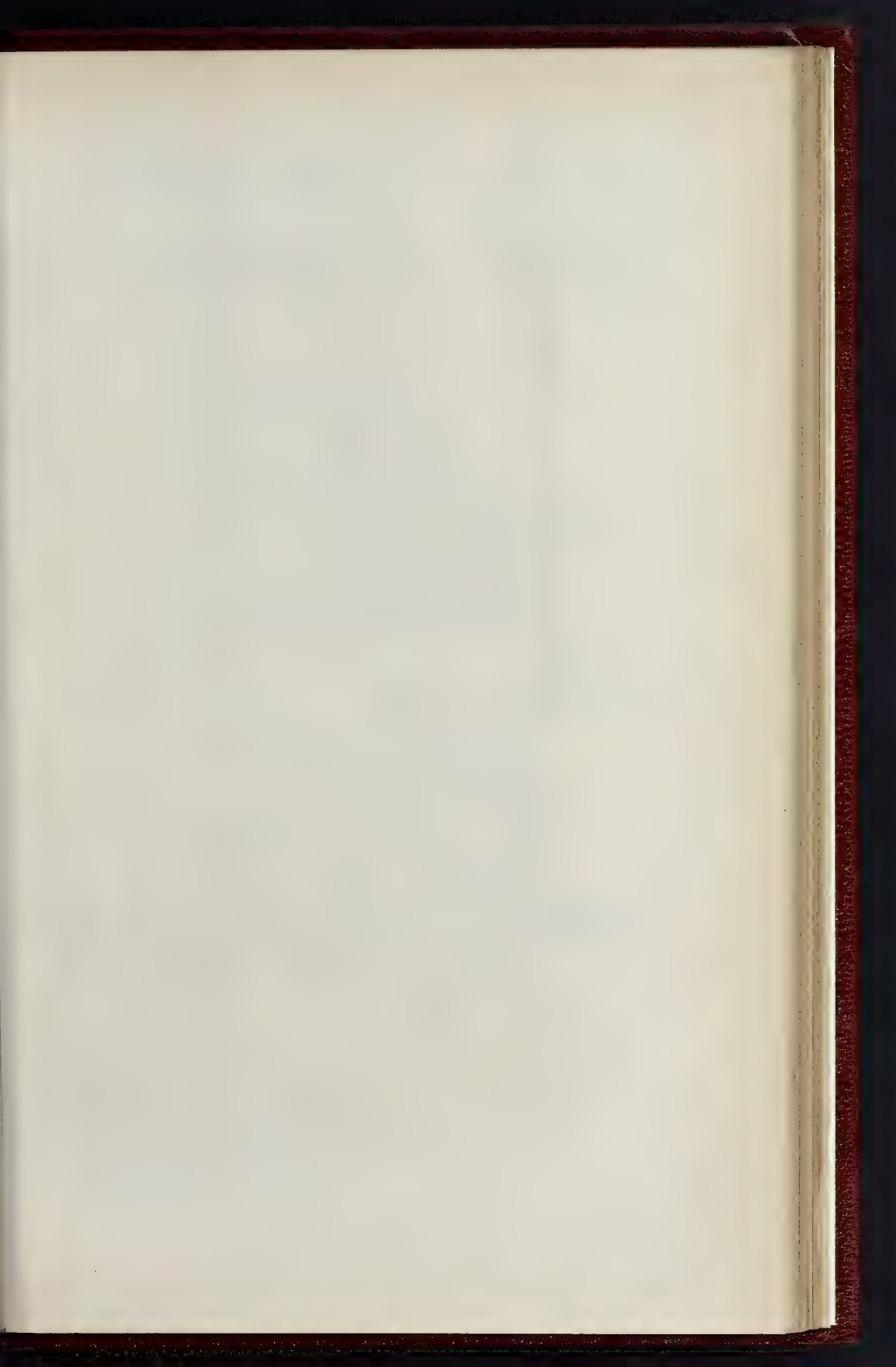




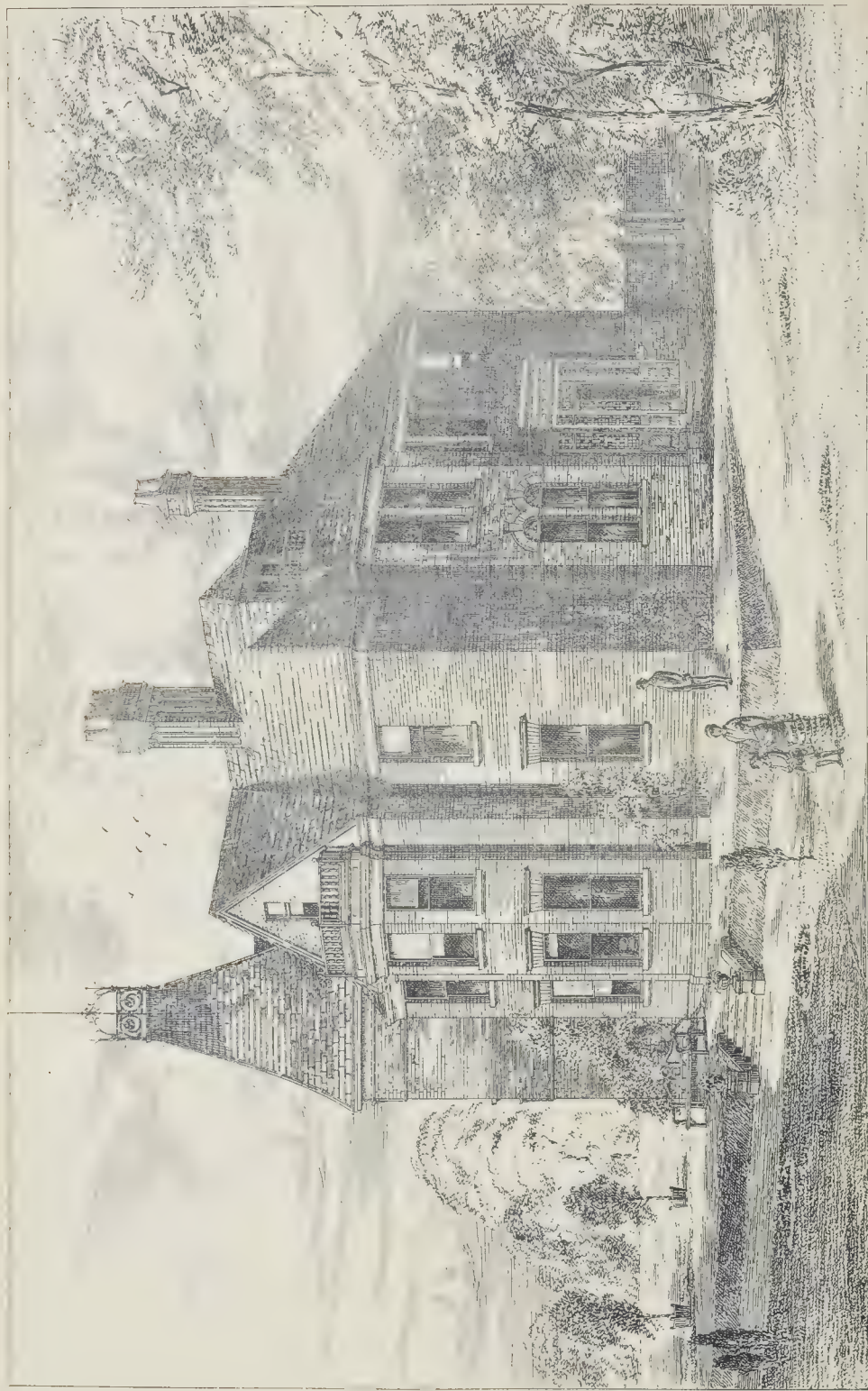
LARGE HALL.—HERR C. PLANER, ARCHITECT.







THE BUILDER, JUNE 10, 1882

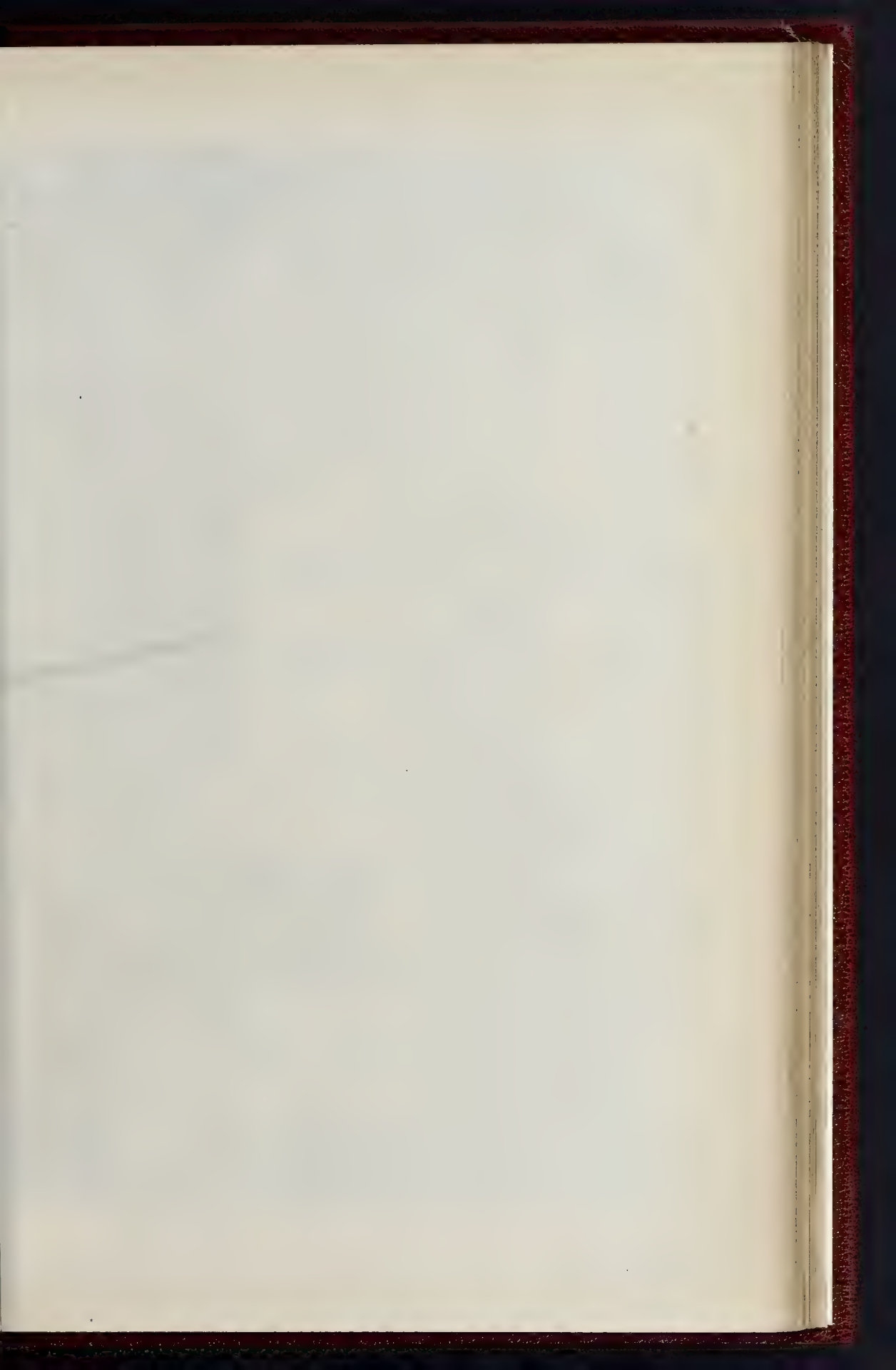


Whitcomb & Black, N. Y. Engrs. & Lith. Co. N. Y.

HOUSE AT START'S HILL, ORPINGTON. MR. G. ST. PIERRE HARRIS, ARCHT.

Arch. & Engrs. 1881





THE BUILDER JUNE 10, 1882.







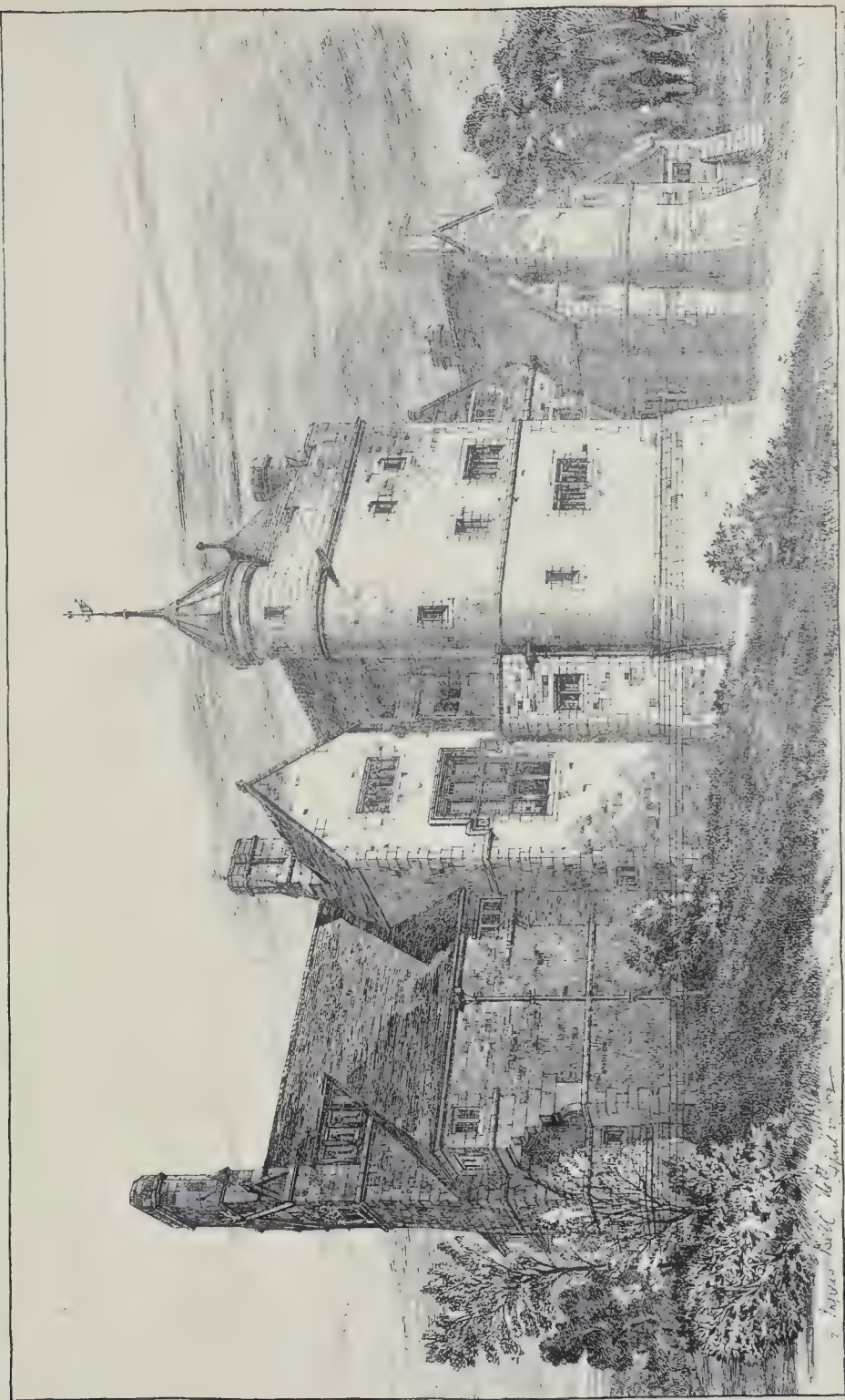
Wm. & A. S. Jones, Printers, Queen St.

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TENTATIVE DESIGN : COMBINED PHASES OF MEDÆVAL ARCHITECTURE.—DESIGNED BY MR. M. UNDERWOOD.







"HEMPSYRE," YORKSHIRE.





## THE NEW CRYSTAL PALACE, LEIPZIG.

Visitors to Leipzig in former years,—unless they were hypochondriacs or confirmed haters of pleasure in whatever form,—always made it a point to spend a few enjoyable hours in the so-called "Schützenhaus," which had a well-deserved name as a place of amusement of the first rank. In consequence of bad times and mistaken speculation, however, the old establishment lost more and more of its former power of attraction, and after a fire, last year, which destroyed a part of it, the "Trianon" its existence seemed on the point of coming to an end. An experienced and energetic caterer, Herr Edward Berthold, however, came to the rescue. He bought the Schützenhaus, and added to the part saved from the flames the "Crystal Palace," which was thrown open to the public in April last. The new building is the work of a young architect, Herr C. Planer, and is almost entirely constructed of iron and glass. The new erection, joined on to the old building, includes a large hall on the ground floor, containing restaurant, Vienna café, with small theatre, and the principal hall, with galleries, intended for theatrical representations and concerts. It is of immense dimensions, and ends in a cupola covered in with sky-blue glass. Beneath the lower hall is the central heating apparatus, by means of which the whole building may be thoroughly warmed. This central heating apparatus is combined with a powerful system of ventilation, which may be rendered still more effective by a large turbine-like ventilator. The latter, as well as the electric lighting of the gardens, is worked by gas-engines. The great hall is illuminated by two Grove sun-burners, each of 1,760 candle-power, the other rooms being lighted by ordinary gas-lamps. Colonnades and verandahs, two stories high, run round the whole garden. The colonnades are also to serve as skating-rinks, while the verandahs offer a pleasant view of the gardens lighted by the electric light.

The above short description will show that, although the whole building is, in fact, simply a first-rate music-hall, the objectionable features of which are probably partly removed by a Continental sense of refinement, it is still a place where respectable people may find rational pleasure. We illustrate the large hall in the present issue of the *Builder*.

## "START'S HILL," ORPINGTON.

SEVERAL houses have recently been erected on this estate. Our sketch shows a house, now nearly completed, for a gentleman for his own occupation, standing on two acres of ground sloping towards the south and west. It is of a simple character externally, according to the owner's wish, built of red bricks with "Brown's" moulded bricks and keys, and the roof tiled with brown tiles from Yorkshire. Great attention has been paid to the attainment of internal comfort and convenience. The external walls are built hollow, and banded with Jennings's tie-bricks; a cement coved cornice is taken all round the eaves of the roof; the rafters are boarded and felled under the tiles; the house is well raised above the surface, which is concreted six inches deep and well drained. The walls externally up to the level of the terrace are asphalted. Bullivant's patent sashes and frames are used for the windows, and the porch is of pitch-pine, and glazed with lead lights and tinted glass.

The internal accommodation consists of dining-room, 25 ft. by 16 ft. (with recess for sideboard and serving hatchway from kitchen), drawing-room, 25 ft. by 16 ft., study, 18 ft. by 19 ft., spacious tiled hall, lavatory, and water-closet. The servants' portion is separated from the rest of the house, and contains kitchen, scullery, pantry, larder, store-rooms, and dry cellage. The first floor is approached by a principal staircase in pitch-pine, leading from the hall and by a back staircase, and contains five large and well-lighted bedrooms, dressing and bath rooms, water-closet, and linen closet. On the second floor are four bedrooms and a cistern and box-room. A housemaid's sink is placed on the half-landing of the back stairs. The fire-places throughout have been fitted with slow-combustion stoves, tiled hearths, and wooden chimney-pieces, and all the rooms are ventilated.

A lodge, stables, and other out-buildings are in course of erection.

The works are being carried out under the superintendence of Mr. St. Pierre Harris, A.R.I.B.A., of 1, Basinghall-street, and Orpington, architect to the estate, by Mr. Haisman, builder, of Foor's Cray.

The total cost of the works, including house, stables, lodge, and out-buildings, is about 4,300*l.*, or for the house alone, about 3,300*l.*

## TENTATIVE DESIGN IN COMBINED PHASES OF MEDIAEVAL ARCHITECTURE.

THE accompanying drawing is in illustration of a letter of mine which you were kind enough to insert in your columns some years ago.

Much had been written and said about a new style. The Law Courts competition, I think, had hardly been decided, and some discussion had taken place as to the superiority of Classic or Gothic. Something new was required,—a sort of Victorian order, not iron and glass,—or brick and stucco, but something solid and monumental.

Without being a partisan of either "Classic" or "Gothic," I believed that the latter had never had fair play at the hands of the purists, who contended, and still contend, that a building must be from top to toe in the one phase: start with Norman and go on heaping round arch upon round arch, lozenge upon lozenge, zigzag upon zigzag, until a magnificent structure of imbecility results.

Norman, although as capable as Early English for our modern requirements, was relinquished after some spasmodic attempts; Early English, Decorated, Perpendicular, "Eclectic," and last, but not least, Queen Anne have all been tried; and, I firmly believe, have all been found wanting. Elizabethan I have not classed amongst the above, as it really inaugurated an era in our modern civilisation when comfort in our homes became a necessity of peace and affluence and strength; for that man who sleeps under a stone, and who is armed to the teeth, is typical of a weak state.

Now, for small manor-houses, farmhouses, or decent-sized homesteads, nothing is more picturesque than the Elizabethan style, with all its incongruities. Ask Mr. Read, whose pencil has so poetically delineated many of its beauties; but we feel, picturesque as its houses are, that true canons of art are lacking, when Classic and Gothic are combined, and are made to form a portion of one architectural composition.

Building as we now do, immense blocks, story upon story, the adhesion to one phase of Gothic, however well treated, becomes nauseating, as in a façade, allowing no break. Again, where the site will allow of a freer treatment, we are presented with a twisting, heaving, rolling, stumbling, rearing, butting, and ponderous mass, looking like a mighty contorted beast in the last agonising throes of death, because a broad, plain, steadfast face, majestic in its simplicity, dare not be attempted. And why not? We find such façades of many stories often enough in Classic, with ample variety. Starting with Tuscan, you can run up the whole gamut, striking chords in Doric, Ionic, Corinthian, and Composite, producing a harmonious whole.

I ask, why not do the same in a modern Gothic building? Commencing with Norman, you add Early English, Decorated, Flamboyant, Perpendicular, and crown all with some fancy of your own, if you are ambitious.

This idea I have endeavoured to embody in the design I submit, and I cannot see,—although my mental vision may be at fault,—that such a building would be more incongruous than a Roman amphitheatre.

MARTIN UNDERWOOD.

## HEMPSYRE, YORKSHIRE.

HEMPSYRE, which forms the subject of one of our illustrations this week, was intended to be built on the site of an old farmhouse, at the head of a wild and romantic Yorkshire valley, not far from the sea coast, and surrounded by moorland. The owner of the property, Mr. J. H. Allan, was well known in the shipping and mercantile world. He was for thirty years connected with the Honourable Artillery Company, and lately retired with the rank of lieutenant-colonel. He was a man of refined and even fastidious taste, with a considerable knowledge of, and strong love for, Mediaeval art, and he had travelled and sketched industriously over a great part of Europe.

As may be readily supposed, when such a man determined upon building himself a house his professional adviser had little to do except to arrange and systematise the stores of material provided for him, and give effect and consistency to a multitude of minute details and suggestions. The system of construction to be employed was laid down with great precision. It was to be,—adapting a recently current political phrase, on "the principle of the three Ps,"—no Plaster, no Paint, and no Paper. Mr. Allan had command of great quantities of choice woods from every quarter of the globe, and in the interior, wherever ashlar was not used, the ceilings and wall linings were to be of wood framing, elaborately moulded and carved, one room being in Canadian woods, one in New Zealand woods, and so on. There was to be no stint in scantling or labour, the floors being "like ships' decks," 3 in. thick, and laid upon beams rather than joists. Everywhere solidity and strength were to be first considered. On the opposite front to the one illustrated, a carved gallery, with figures of the four seasons in oak, the signs of the zodiac on a frieze of copper in repoussé work, and a good deal of beaten lead ornament would have formed conspicuous features.\*

The projector of the work died in his City office, almost suddenly, just as his final approval had been given to plans which had been in preparation by Mr. Ingress Bell during several years; and it is to be regretted on many grounds that an architectural enterprise of a somewhat unusual character should have thus fallen through.

## WILLIAM GAWIN HERDMAN, OF LIVERPOOL.

WITHIN the last few weeks has been gathered to his fathers, from the scene of a long life's labours, a Liverpool artist, and one of the fathers of Liverpool art, who cannot but be deemed worthy of honourable notice in any journal devoted to the interest of architecture, an art to the illustration of which, both in his native city and elsewhere, a considerable portion of his life was dedicated. On the gratitude of his native city Mr. Herdman had stronger claims, I conceive, than many on whom so has bestowed her highest honours, and chiefly for rescuing from oblivion the material Liverpool of his youthful days (about 1820), which then included its few antiquities, and was one of the most beautiful towns in England,—more beautiful, specifically I think, than the Liverpool of to-day; a service especially valuable in Liverpool, since nowhere else, perhaps, have original architectural features so fast disappeared before the advancing tide of commerce. To this work he gave heart and soul, and it is generally acknowledged that he succeeded in doing full justice to his subjects. A water-colour picture by him of the old market-place, top of James-street, was bought by the corporation.

Next to the illustration of architecture, which was generally the chief material of his landscapes, the reformation of perspective was the great object of his life for the last twenty or thirty years, the present system of which he rejected on finding that the representations of objects by its rules on the picture do not coincide with the results of vision or sketches made by the hand and eye; not duly considering, perhaps, that perspective has regard only to the laws of projection, and that its province is the projection of lines, planes, and solids on a flat surface. His work, "Curvilinear Perspective," however, has, I believe, done good among artists by leading or driving them to the earnest study of the subject. His new views were first broached in the *Art Journal* in 1849, and were there extensively criticised.

But Liverpool's and artists' obligations to Mr. Herdman will be best shown in the following lively sketch of his career which he sent me a year or two before his death, and which, through his own request, has already appeared in the *Liverpool Mercury*:—

"Having a taste for architectural subjects, I began very early in life (about thirteen years of age) by sketching the old buildings of Liverpool, most of which,—except the Castle,—were at that time still in existence. I drew all the old remains, such as the Tower, the Old Church of St. Nicholas, old

\* The walling stone would have been furnished by the quarries on the owner's estate, and it was his intention to carry out the work by workmen immediately under his control, and without (except for certain items) the intervention of a contractor.



St. George's, all of which I remember well. I made drawings of these and the old houses and streets because there was nothing in the shape of art in the town for a young lad to draw or copy. By the time I was twenty years of age I found I had made something like 300 drawings of relics of old Liverpool, many of which were passing away; but I had no idea of doing anything with them at that time. A few years afterwards, on becoming acquainted with Mr. Egerton Smith, he told me I should publish these views, and that in time they would become very valuable as historical works of the early architecture of the town. I did so, and published my first volume of 'Ancient Liverpool,' which is now at a premium of double. In a few years I published a second series, which is also at double its original price. I am now publishing my third and fourth volumes, which have been pronounced by the papers and all who have seen them to be the finest work of the kind ever issued in the provinces. I have thus done more for Liverpool and its antiquities than any other town in England, even London, has received. It must be remembered, in issuing these four books, I made out the drawings myself, collected the historical portion, and wrote the letterpress also. When about twenty-six years of age I was made a member of the Liverpool Academy, and when I became secretary of that society I was the first to lower the aristocratic shilling for admission to twopenny in the evening towards the close, so that the working classes for the first time in the history of art had an opportunity of improving their taste. I was the founder of the shilling art-unions, which gave the public the power of obtaining good works of art which they never could otherwise obtain. For the first four years after the shilling art-unions were formed they brought 20,000 a year to artists—the Great Britain alone bringing 4,000 a year. I have been a fine-art critic for nearly forty years, and my sole objects were to instruct the public and keep up the position and sales of the artist. Having early to take to teaching drawing, I turned my attention earnestly to perspective, and having studied Malton and other writers on the science, I was astonished at the wretched state it was in. When I read in Malton that in a front view of a building, with columns of equal diameter, the diameters increased in magnitude as they receded from the eye laterally each way,—the nearest pillars to the eye being the smallest, and the furthest being the largest,—I closed Malton and every other work on perspective, wondering how one of the correct sciences could have remained in such a state of utter absurdity. I turned to nature and found the truth; and Sir David Brewster examined my discoveries in perspective, and stated them to be true publicly at a meeting of scientific individuals at the Duke of Portland's. Mr. Curvilinear Perspective is the perspective of Nature, not of Art; it would be that of art also with cylindrical pictures. In studying the laws of appearances in nature several new truths revealed themselves. For instance, the rays of the sun, on issuing from the luminary, are generally considered to spread out into space and to get lost there. Careful thought and observation, as arranged and prevalent in the world around us, convinced me this would not be the case,—that form was never left in such an indefinite manner; and I reasoned myself, without ever having seen the phenomenon, into the truth that these rays of the sun, after spreading out in curves to 90° from the sun, would contract after that distance, and at 180° from the sun would unite again in a point exactly opposite the sun. It thus became evident that their meeting again at 180° from the sun would only be at sunset or sunrise, as at no other periods of the day could 180° be visible from the sun. I therefore set myself to watch for this novel effect, which had never been seen by human eye as this planet. For some two years or more I looked in vain, but, strong in faith, persevered, when one fine sunset, being at Southport, I went to the Birkdale sandhills, and, ascending one of the highest of them, watched the rays spreading out from the luminary as it drooped to the sea, and looking constantly to exactly the opposite point of the horizon, I saw for the first time the same rays,—having traversed the expanse of the heavens,—approaching again, and uniting into a point opposite the sun in the eastern horizon. I have seen this phenomenon many times since, and was fortunate in seeing it one summer evening by St. Domingo Mere, when your two sisters happened to be passing, and I showed it to them, and they expressed great delight at seeing for the first time such a strange and beautiful effect. The fear of being tedious stops me from naming several effects of the laws of the visibles which I noticed for the first time, and which had been before neglected or unknown. I will close this by a brief reference to my various works. I have published in all ten works on different subjects, four of these being on the pictorial history of Liverpool. Of my unpublished works, my large volume of poems in MSS. and print is substantially bound, and in the Free Library at Liverpool, and my 'History and Practice of the Art of Skating,' with 100 figures drawn by myself, and ready for the engraver—all of which I could personally perform on the ice,—is yet in MSS., as the offers of the publishers were so small I would not accept them. I may close this by calling attention to my invention of those unique and accurate

machines, four of which I have put up in Stanley Park, which show exactly, to the scratch of a pin, any object, even if sixty or seventy miles off, and also names the object to the spectator using the machine. These machines cost me a considerable sum, as they were three times destroyed by the roughs at the north end of the town, merely to get possession of the brasses on which the names of objects were engraved."

In addition to the works above named, the Liverpool Free Public Library contains of his—*"Folio of Studies," "Views of Fleetwood-on-Wyre," "Thoughts on Speculative Cosmology and Principles of Art," "Hymns and Sacred Melodies."* One of his finest poems, "Walton Bells are Ringing," he told me had been set to music by Mr. Skelton.

His versatility recalls that of Da Vinci himself, for he had studied almost everything, and civil engineering amongst the rest, for he once proposed to bank up Morecambe Bay at the entrance as a vast reservoir for Liverpool. Let me add, he was a wonderful skater; and many will remember how he used to astonish the good folk assembled round the lake in Stanley Park by his extraordinary gambols and tricks on the ice. As to his claims on our respect as a man: an old associate of his in the Liverpool Academy, a sculptor of well-known merit, speaks of him as a pleasant, kindly man, whom he liked much, "for," adds he, "I knew he would do a good turn to any one he thought deserving, and would go far out of his way to do it." And this fully agrees with my own impression of his character. His fault as an art critic I have thought was that his kindness of heart led him occasionally to praise too lavishly. He reached the ripe age of seventy-nine. His son William has published "Views in Modern Liverpool." S. H.

#### EDINBURGH ARCHITECTS.\*

MR. ROBERT REID—MR. GRAHAM—MR. HENDERSON  
—MR. BLACK—MR. COUSIN.

ROBERT REID, Crown Architect for Scotland from about 1806 till 1836, is a man to whom Edinburgh owes some of her most important buildings. He designed St. George's Church and the frontages of Charlotte-square, and the old Bank of Scotland in Bank-street, previous to its alteration by Mr. Bryce. He was the architect also of Parliament-square and the Courts of Law. He submitted competition designs for the national monument and for completing the University, both of which I have the privilege of being able to exhibit through the kindness of Mr. A. Kerr. In the provinces he erected the war prisons of Perth, Greenlaw, and the County Buildings of Perth. The design on which his fame will principally rest is that of Charlotte-square. There is no square in the United Kingdom or anywhere else which, as far as I know, will compare with Charlotte-square in the beauty of proportion and palatial dignity. It is a matter of great regret that our civic rulers ever allowed the lines of the original design to be interfered with, as unfortunately they have been on all the sides except the north, which, fortunately, stands, and I hope will long stand, in its original beauty.

James Gillespie Graham deserves an honourable niche among the architects of Edinburgh if for no other reason than that to him we owe the beautiful spire of the Assembly Hall on the Castle Hill. Of Graham's career I have found it impossible to get much authentic information. He seems to have been born about the year 1777. Of his earlier days we know nothing. A rumour prevails that he was a mason by trade. There is a story, which, if true, is both interesting and romantic. Graham's original name was Gillespie. As a mason he was engaged working at the mansion house of Orchill, near Crieff. The daughter of the house, Miss Graham, saw and loved the handsome young craftsman, and with the strength of will born of strong attachment, was bent on making him her own. The details of this love story I do not profess to know; but the lady, as ladies often do, carried her point, and in course of time the young mason, James Gillespie, was transformed into James Gillespie Graham, esq., of Orchill. His advanced social position seems to have kindled or fanned his love for art, and shortly afterwards we find him a full-fledged Professor of Architecture. That much study and training preceded his

attainment of this position is without doubt, but, unfortunately, we have no information as to how or where he studied. The earliest notice I can find of him is in Ferrey's "Life of Pugin." During Pugin's younger years he was very fond of the sea, and to his father's annoyance used to sail about in a yacht, taking very considerable voyages, very much to the detriment of his architectural training. During one of these voyages he was wrecked on the Scotch coast, some distance below Leith, where he and his men all but perished; this event led to his friendship with Mr. Gillespie Graham, the well-known architect of Edinburgh, which he always prized most highly (I am quoting Pugin's biographer's words). "Having lost everything, he (Pugin) arrived in Edinburgh in a destitute condition. Knowing Mr. Graham by fame, he applied to him, and was received with the greatest kindness; this gentleman, to use his own expression, completely 'rigged him out,' provided him with money, and, what was more to the point, gave him sound advice. Foreseeing the talent of the architect cropping out in every word of his conversation, he conjured him to give up his mode of life, and to pursue the career for which nature had so brilliantly prepared him. Before taking leave Mr. Graham gave him his own pocket compasses as a reminder of his advice. These were the famed instruments which he used through life, which appear in Herchel's portrait of him. Upon them is engraved 'James Gillespie Graham, Architect, Edinburgh, 1830.'" This exceedingly interesting episode in the lives of these two men shows clearly that even in 1830 Graham was a man known to fame. There is no doubt from the consecutive dates in the book (Pugin's life) that the date 1830 refers to the time when Graham gave the compasses to Pugin. It is natural here to refer to another somewhat famous incident in which the two names were conjoined. In the year 1835 there was perhaps the most famous competition which ever took place in this country for the re-erection of the Houses of Parliament burned down in the previous year. It is hardly necessary to say that almost every man of note in our profession entered the lists for this great prize. Among the eighty-four designs submitted, one of the most notable for its entirely Gothic treatment, which was the style prescribed in the conditions of competition, was submitted by Mr. Gillespie Graham. This design, it appears from Pugin's biographer, was partly, if not mostly his. He says that Pugin never denied that the drawings were his, and the composition to some extent his own. I do not wish you to attach too much importance to this statement; because it is possible that Pugin here claims more credit than is his due. Attempts have been made to detract even from Barry's credit for the completed Houses of Parliament, on the ground of Pugin being employed to design some of the details. The extent and importance of Graham's commissions incontestably prove that his position was derived from his own merits, and not from any occasional assistance from an outsider, however eminent. In 1834 he was asked to take part in a limited competition for Donaldson's Hospital, the other two competitors being David Hamilton, of Glasgow, architect of the Exchange there, and W. H. Playfair, who was ultimately the successful competitor. Graham's executed works in Edinburgh are the Roman Catholic Chapel in Broughton-street, the interior of the chapel of Heriot's Hospital, St. Margaret's Convent in White House Loan, and, last and best, the Assembly-hall, with its most beautiful spire. In the country we have Dunbar Church and Liberton Church, and the tower of which always appears to me a beautifully-adapted tower to the commanding position which it occupies; and of mansion-houses, we have Minard House and Mintoyle. Graham died in Edinburgh, in March, 1855, in the seventy-eighth year of his age.

One of the earliest adherents of the Gothic Revival in Scotland, and one of its most ardent pioneers, was John Henderson. He was born in Brechin in 1804. In due time he came to Edinburgh, and very oddly (when we know his future work), he was for some years in the office of Mr. Thomas Hamilton, architect of the High School, one of the most distinguished Classicists of our day. Henderson commenced business here about the year 1835. He seems to have attained, at an early stage, a large ecclesiastical connexion. His works are principally churches, and they are very numerous.

\* By Mr. M'Lehlan. See p. 667, ante.



In Edinburgh we have Trinity Chapel, at Dean-bridge; St. Luke's, Queen-street; St. Columba's, on the Castle-hill; Morning-side parish church; the front of Lady Glenorchy's, Greenside; and Holyrood Church and School, and Hospital for Incurables, built and endowed by Sir John Gladstone, the father of the Premier. His principal secular work was the Highland Society's Offices and Museum, George IV. Bridge. Mr. Henderson's country churches and chapels were very numerous, including the Episcopal churches at Stirling, Arbroath, Montrose, Pittislog, Port Glasgow, Dunblane, Hamilton, Dunoon, North Berwick, and private chapels of the estates of Ardgowan, Dalnaboy, and Lamington and Fasque. Mr. Henderson's principal work, however, was the Episcopal College and Chapel at Glen Almond, Perthshire. This is a very fine work, surpassing anything in Gothic work seen up to that date, 1860, in Scotland. Mr. Henderson died in 1862 in full possession of his powers, and the works in progress connected with his practice were completed under Mr. Cousin.

We cannot pass on without a word about Mr. Alexander Black, of Heriot's Hospital, lovingly remembered even yet as "Sandy Black." After the lapse of twenty-four years (he died in 1858) his memory is fresh and green among those who knew him. This is a remarkable example of a long-lived memory attaching to a man of by no means first-class position. He seems to have filled a large place in the hearts of those who knew him, and they love to recall his sayings and doings, his good-humoured bantering and his jokes (at times somewhat broad), but never malicious or ill-conditioned. The chronicle of his architectural works is not long, but it indicates great ability. He constructed the outdoor Heriot Schools in Society-square, Old Fishmarket-close, foot of Cowgate, Young-street, and Broughton-street. In all of these he introduced successfully improvements in arrangement and ventilation, and also applied the details of the hospital with happy effect to express their connexion with the parent institution. Latterly, he was much employed as a referee. Perhaps no professional architect in Scotland of his time was more frequently chosen both by courts of law and private litigants as an arbiter. In early life Mr. Black took a deep interest in the School of Arts, and contributed much to its success by acting for many years as honorary librarian. The students and directors marked their deep sense of their obligations by presenting him with a piece of plate. In private life Mr. Black was universally esteemed. It may be interesting to mention that Mr. Hugh Cameron and Mr. George Hay, distinguished members of the Royal Scottish Academy, both received their earliest artistic training as apprentices of Mr. Black.

It is with special pleasure that I close my notice of former architects by a notice of my old master, Mr. David Cousin. He was a man of much cultivation and great character, and left a marked impression on all those with whom he came in contact. His career was, on the whole, a prosperous one. His father was a builder in Cumberland-street, Edinburgh; and the son, though destined for the architectural profession, went to the joiner's bench and acquired practical knowledge, which he was fond of referring to in after years. After these years of practical experience he entered the office of Mr. Playfair, and remained for many years as one of the assistants there. He used to tell with great glee many stories of the strictness and vigour of Mr. Playfair's rule, and the devices to which his assistants had to resort to escape detection if at fault. From Playfair's office Mr. Cousin removed, about the year 1833 or 1834, to the City Chambers, where he entered the office of Mr. Thomas Brown, City Architect, as his principal assistant. How long he remained I cannot say, but not long afterwards we find him in business for himself, and competing for the West Church of Greenock. He was successful in this competition, and deservedly so. His design is Classical,—what might have been expected from a pupil of Playfair,—and the spire emulates those of Wren in the grace of its outline and the beauty of its proportions. All Greenock men even to this day are proud of their West Church spire. Although success crowned Mr. Cousin's efforts in this competition, the result upon his health of the prolonged thought and strain of the competition was, for the time, disastrous, and he was laid low with brain fever. Recovery happily followed, and in the year 1843, the year of the Disruption, he was more busily engaged

than any other architect in Scotland in building churches for the Free Church congregations which had left the Establishment. I have heard Mr. Cousin often saying that at this period he was nominally the architect of more buildings than he was aware of. He prepared, at the instance of the General Assembly of the Free Church, a model plan and specification of a plain structure, to accommodate a congregation at the least possible expense. About 13s. per sitting was the sum he mentioned, if I remember rightly. You must all be acquainted, in the different quarters of the country of which you have knowledge, with the buildings of which I speak. Four walls and a roof are all that can be said for them, but they served the purpose well at the time they were wanted. Mr. Cousin was always of opinion that the association of his name with these cheap buildings did him a great deal of harm in after years. When some of the Free Church congregations became wealthy, and wanted finer structures, common gratitude should have sent them to David Cousin, who had designed their bald structures in their time of need, and charged little for it. But they did not follow the dictates of gratitude, and when buildings of importance came under consideration, they looked elsewhere for an architect. Mr. Cousin had always a particularly strong feeling as to the treatment he received in connexion with the Free Church College. He competed with other architects, and his design was highly favoured by both Chalmers and Candlish, who at that time ruled the councils of the Church; but, notwithstanding that, all the competitors' designs were thrown overboard, and Mr. Playfair employed, at the bidding of some of the wealthier and more influential members of the body, without any competition at all. The present building at the head of the Mound is the result of this,—what may be called an intrigue,—and it is not a successful effort of the genius of Playfair. Notwithstanding this treatment on the part of the Free Church, Mr. Cousin prospered otherwise. In 1847, after a keen contest among several Edinburgh architects, Mr. Cousin was successful in gaining the position of City Architect in succession to his old master, Mr. Thomas Brown. While occupying this important post, it fell to his lot to design several important buildings connected with the city. To him belong the designs for the Corn Exchange in the Grassmarket, and the slaughter-house in Fountainbridge. The façade of the latter has always appeared to me a peculiarly happy adaptation of Egyptian features to the character of the place. And the arrangement of the place inside is still regarded by those whose opinions are worth something,—that is, those who manage the establishment,—as worthy of great praise. Indeed, even at this time of day, more than a quarter of a century after its erection, it is in many respects a model establishment. In addition to these buildings and some others of less note which fell to his hands as city architect, Mr. Cousin designed some noteworthy buildings in his private capacity. He was the author of the Savings Bank buildings at the top of the Mound, a well-grouped mass of buildings in the position it occupies, and the Music Classroom in Park-place. The latter design is a remarkably harmonious and pleasing one. I have a vivid recollection of seeing the drawings, on the groundwork of which he prepared his design. Music and architecture, he held, were similar arts in producing harmony and discord. In the one the effect was produced on the mind by sounds, in the other by lines. Fully possessed of this idea at the time of the Music Classroom, what may be called the foundation drawing of this fine structure,—and the same principles were applied internally and externally,—was a complicated series of circles, and arcs, and curves,—proportions and ratios. Mr. Cousin acted as architect to the British Linen Company's Bank, and in that capacity designed many of their branch offices, among which may be mentioned those of Hawick, Dundee, and Paisley, all good examples of Classic architecture applied to modern requirements. The last architectural scheme with which Mr. Cousin's name is associated was the City Improvement scheme. He had this work very much at heart, and for whatever advantages our city has derived from opening up Simon-square, Nicolson-square, and the dense closes north and south of the Canongate, we may thank very much the ability of Mr. Cousin. After the inception of the scheme his health failed, and Mr. Lessels was conjoined

with him in carrying out the work. In his dealings both with contractors and clients Mr. Cousin upheld the best traditions of our profession. While treating contractors with the utmost courtesy, he still insisted on getting the best work from them, and, on the other hand, he preserved an equal independence with clients. While careful to see that they got their demands satisfied as far as their means permitted, he was equally careful that injury was not done either to his own reputation by parsimony where that could be avoided, or to the tradesmen, by too much being exacted at their hands. He treated his assistants with unflinching courtesy.

At the close of the paper a hearty vote of thanks was accorded to Mr. McLachlan for his paper, on the motion of Mr. Blanc.

#### THE NEW MUNICIPAL BUILDINGS AT YARMOUTH.

THE area of the site of these buildings (which were opened last week by the Prince of Wales, and of which, as we stated last week, we have given illustrations) is about 115 ft. square. The front façade faces the north. Here is the principal entrance, which opens into a vestibule, and thence leads to the centre hall, the latter giving access to the offices on the ground-floor, which are generally those devoted to the municipal authorities. The central hall makes a very favourable impression upon the visitor, both by its dimensions, which are 80 ft. by 24 ft., and by its style. From the central hall, which is separated by two screens of teak from other portions of the building, leads the grand staircase communicating with the first floor. Before ascending the grand staircase, we may return to the vestibule, where we gain an entrance to the Town Clerk's offices,—that for the clerks measuring 21 ft. 6 in. by 14 ft., and the private offices 21 ft. 6 in. by 16 ft. Adjoining on the west side of the hall is a room measuring 31 ft. 6 in. by 17 ft. 4 in. This is to be known as the public office. Beyond this is the Monument-room, 31 ft. by 10 ft. The committee-room adjoins, and measures 31 ft. 6 in. by 27 ft. 6 in. On the south side are the rooms for the accountant, which have a special entrance. The accountant's private office is 21 ft. 3 in. by 18 ft. 3 in., and his public office 21 ft. 3 in. by 18 ft. A gentlemen's cloak-room adjoins the accountant's offices, and then come the store and several other minor offices. At this point is an entrance for tradesmen, and, close by, the police entrance. Here the chief constable and police are provided with two offices, and ready access to the cells is had from the entrance-hall. At the east end of the hall are the witnesses' waiting-room, measuring 23 ft. by 22 ft. 9 in.; at this end also is the entrance to the law courts. At the north are the surveyor's offices, that for the clerk measuring 22 ft. by 17 ft., and the private office 22 ft. by 12 ft. 6 in. The Inspector of Nuisances will take up his quarters in an apartment adjoining. Adjoining the Surveyor's office is the Barristers' room, 22 ft. by 13 ft. 6 in., with strong closets for storing the Corporation plate and regalia. The ladies' cloak-room adjoins this in a corresponding position to the gentlemen's retiring-room on the opposite side of the hall. Returning to the grand staircase we note that the steps are of white Portland stone and the balusters and newels are in teak, carved. The windows are decorated by means of lead glazing, and an elaborate design in similar decoration appears in the ceiling. Turning to the left, through the card-room, the visitor gains entrance to the Quarter Sessions Court, measuring 32 ft. 6 in. by 40 ft. 6 in. The Judge's retiring-room, which is also available as a card-room, being close to the Assembly-room, has a handsome stove of special design, the work of Messrs. Barnards & Bishop, of Norwich, executed from designs by the architect, Mr. Pearce. The chimney-piece is handsomely carved, and the hearth bears the Yarmouth arms, according to special designs. The assembly-room, which is the principal and handsomest apartment in the hall, ranges along the whole length of the west end of the hall on the first floor. It is 100 ft. by 45 ft. wide, and sitting accommodation,—bent-wood chairs,—is provided for 900 persons. A teak screen, elaborately carved, separates the portion at the north end of the room for a refreshment buffet. This screen is supported by substantial columns. A teak moulded dado



runs round the walls of the room, and in it are worked channels for the inlet of fresh air. The room will be heated by hot-water apparatus. The room is lighted by eight brass brackets and chandeliers, containing upwards of 200 lights. A pitch-pine staircase leads from the assembly-rooms to a snug smoke-room, and near by is a committee-room or supper-room, measuring 36 ft. 6 in. by 25 ft. 6 in. The mantelpiece in the supper-room or Council-chamber is a most important feature, constructed of teak, carved by Minns. The over-mantel has glazed panels, with the Yarmouth arms picked out in colour. The stove is also of special design, the tile slips at the side representing field sports, and the hearth has the Corporate arms. This room is furnished with table and chairs especially adapted for the Council meetings. In the corridor is an apparatus for keeping places warm, and food and coal lifts communicating with the offices on the ground-floor. The kitchen on the second floor is well arranged, and the cooking machinery is complete. The hall-keeper's sitting-room and kitchen adjoin this larger kitchen pertaining to the hall proper. Special rooms have been provided for the use of the grand and petty juries. The police-court, situated at the south-east corner of the building, on the first floor, is 37 ft. by 32 ft. 6 in., and ample accommodation will be provided for the public and those engaged in the causes. A bench at the east end is provided for the magistrates, the public sitting at the north side; the arrangements for the solicitors, &c., are most satisfactory. Near by is the justices' retiring-room. The fireplace here is worthy of attention. Upon the stove are the Yarmouth arms, and painted on each side are emblems denoting "Justice" and "Mercy,"—all hand-painted. The chimneypiece is of oak. The courts are fitted up with pitch-pine. The comfort of the witnesses in attendance to give evidence has not been neglected, a room having been provided for their exclusive use. From the cells on the ground-floor a stone staircase communicates with the court, so that the prisoners can be taken direct to the dock, and it is proposed to have a subterranean passage in connexion with the police station. For getting access to the Quarter Sessions court, a turnkey's lobby, with a private staircase, is provided. The floors of the principal halls and corridors are laid with mosaic paving, the lavatories, &c., are paved with encaustic tiles, and the staircases are of white Portland stone, with ornamental teak balusters. The roofs are covered with Ashton & Green's permanent green plates, and the windows and fittings in the principal room are of teak, of which material, polished, is also the floor of the assembly-room.

The furniture of the doors, the fenders, fire-irons, gasfittings, and coal-shoots were all specially designed by Mr. Pearce to agree with the character of the building. Much of the furniture is of oak. The chairs in oak and morocco have been specially designed by Mr. Pearce, and are handsome. In the assembly-room there are to be bent-wood chairs. The contractors for the furniture were Messrs. Norman & Son, of Great Yarmouth; and Messrs. Finch & Co., of City-road, London. All the stoves, fenders, fireworks, &c., were executed from Mr. Pearce's designs by Messrs. Barnard, Bishop, & Barnards. The stone carving was executed by Messrs. Seale, of London; the wood-carving by Messrs. Howard & Son, Bethel-street, Norwich; the fittings of the courts by Messrs. J. W. Lacey & Co., and the gasfittings by Messrs. C. Payne & Co., of Redwell-street, Norwich.

**Breakage of Glass from Hail-stones.**—A German technical journal remarks that hail-stones are less likely to injure glass roofs than has often been supposed to be the case. It is suggested that in calculating the thickness of glass, more regard should be paid to the power of resisting dead weight than to any other standard of strength. With the usual distances between the cross-bars, it is estimated that a thickness of 5 to 6 millimetres ('19 to '23 in.) is sufficient to resist any damage from hail. On account of the imperfect cooling (and the consequent brittleness) when excessively thick glass is being manufactured, it is recommended not to use for roofing purposes glass of more than 10 to 12 millimetres thickness ('38 to '46 in.).

## BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

On the 27th ult. a special meeting of the members of this Society for the West Gloucestershire district was held at Staunton and Newland. The following account of the meeting is abridged from the *Gloucestershire Chronicle*.

Most of the company assembled at Coleford, where carriages were in waiting, and a ride of two miles brought the party to Staunton, a parish near the boundary of the county. Rain interfered with the comfort of the excursionists, some of whom, however, stopped to inspect the ancient stone on the road,—the "Long Stone,"—said to have been used as a mustering-place for soldiers from long before the Roman invasion. Leaving this stone, the party pushed on for the church at Staunton. All Saints' Church is a stone building, having a chancel, nave, aisles, and a tower with six bells, and it well repaid inspection. Mr. J. H. Middleton described some of the chief features of the church. He said in that building they had the whole history of the development of the Early English form of architecture from the Norman, a circumstance which spread the work almost over a century. The earliest part of the structure, as far as he could see, was begun about 1100, and the old builders, wanting to build well, proceeded slowly; and whilst they did this the style was altering, and the history of the alterations was shown on the arches as they worked on. One did not often see this development at a glance as it could be observed in this edifice. The church, when finished about the year 1200, had nave, tower, transepts, which had practically disappeared, narrow aisles on each side, and a chancel narrower than it was at present. Mr. Middleton pointed out alterations that had been effected during the fourteenth and fifteenth centuries, and in drawing attention to some of the more striking objects in the church, mentioned two fonts, one of which appeared to be Saxon, and the other of a later period, and which he regarded as "perpendicular."

The Castle Meadow was next visited, though the appropriateness of the name is somewhat questionable, as, though trenches have been opened to discover remains which might justify the theory of a castle having once stood on the spot, the researches have been rather barren of results.

Mr. J. F. Nicholls, of Bristol, gave an address on "Old Landmarks." He said the Egyptians, Etruscans, and the Romans divided parts of the land into square portions, which were allotted for all time. The chief lines, *cardo* and *decumanus*, began at the Colonial City; this would be either Gloucester or Caerleon, and these lines became generally public roads, and were drawn, where practicable, from some striking natural object to another striking natural object, or else some artificial hill, mound, or well was substituted where the contour of the country required such a mark. These four lines being marked out, the surveyors proceeded to cut up the four regions into rectangular estates, by a repetition of lesser *limites*, or roads, which generally ran parallel to the larger divisional roads; these again were subdivided, until the boundary of the territory outwards was reached. The breadth of the main road, *decumanus*, east and west, was 40 ft.; that of the *cardo*, 20 ft.; the *limites*, 12 ft.; that of the *linearis*, 8 ft. These latter divided the Colonists' estates each from the other into estates of 200 to 240 jugera, —40 to 50 acres. The liminary ways or lines thus specifically marked out the bounds of each estate. The forty acres were square, the others rectangular as far as possible. The marks of the division of estates were stones, megaliths, inscribed or plain. Where three estates met, there was a trifinium, or dolmen; where four met, a quadrifinium. The inscribed stones bore either letters which signified the relation of the division to the main road,—*cardo* or *decumanus*,—or they bore the name of the estate, or of the owner. The inscriptions were at the top, or on the sides, the latter being thought to be the best. Sometimes the surveyors made the shape of the stone to represent the number of the converging estates,—thus a triangular-sided stone for a trifinium, a square stone for four estates, &c. Trees, wells, tumps, altars, &c., were also used. The altars were set up at the cross roads; country people sacrificed there; and hence came the system of Christian crosses,—a distinct Roman survival. The marks of the larger divisions were, if possible,

natural; failing this, the tump, covering potsherd, charcoal, or other imperishable material too valueless to steal, or covering a deep well filled with rubbish, was used. When stones were used here, they were larger, called *pro-signes*.

Despite the rain that was pouring down pitilessly, the majority of the party ascended the steep hill in order to see the Backstone, a peep at the "Double View" being abandoned. Through the misty atmosphere glimpses of verdant heights in the distance were obtained. It was worth the toil and discomfort of climbing the hill to see the huge stone, which is a mass of old red conglomerate, the greatest length on the top being 19 ft. and breadth 13 ft., the entire circumference 57 ft., and height 12 ft. The north side measures 17 ft., the south 12 ft., the south-eastern 19 ft., and south-western 9 ft. The point on which the stone stands is about 2 ft. in diameter. The slab on which it rests, at a height of 891 ft. above the sea, measures on the north 14 ft. 9 in., south 14 ft., south-east 12 ft., south-west 21 ft. 5 in. Mr. J. F. Nicholls offered some observations on the stone, and after a short interval for rest the excursionists descended the hill, and were hospitably entertained by Mr., Mrs., and Miss Francis.

Newland was the next point, and the party here inspected the ancient church, a handsome stone building, having chancel, three chapels, nave, aisles, and a tower with pinnacles and six bells. The building was entirely restored in 1862, at an expense of over 4,000l. Mr. Middleton said there was special interest in that church, for, as a rule, churches started from small beginnings, and were added to from century to century; but that one, with a trifling exception, was built exactly as they saw it now. He was speaking of the walls and not of the windows, most of which had been put in in the last few years, or scamped to look as if they were new. The building was commenced about 1300, and went on steadily about forty years, the last part done being naturally the highest,—the tower,—which was the most splendid, and was a sort of transition from the Decorated to the Perpendicular. Judging from the pinnacles on the tower, and how early the Perpendicular was used, the tower must have been completed about 1340, which was pretty quick work for those days. He called attention especially to the west window, the mouldings of which were splendid. Of the Decorated windows round the church there was only one left; all the others had been inserted in the Perpendicular period, or else destroyed at the late restoration. Unfortunately all the screens were removed from the church, though there were marks remaining to show where they had been. The date of the present font was 1661, and it was very interesting on account of the date, as few fonts were made in the seventeenth century. The tombs of the church were worthy of notice, among them being figures of two priests in sacramental vestments, one of which was curious, being at the beginning of the fourteenth century, with a peculiar alb; the other was of the fifteenth century.

Mr. J. F. Nicholls called attention to the fact that one of the greatest benefactors in Bristol was connected with Newland. He believed that John Whitson, founder of the Red Maids' School in Bristol, commonly called Alderman Whitson, was born at Clewwell, but he was educated at Newland.

Clewwell, with its well-preserved preaching-cross was next reached, and a little later dinner was served at the Angel Hotel, Coleford, to which between sixty and seventy ladies and gentlemen sat down, Sir John Maclean presiding.

**A Seaside Resort.**—Extensive works are about to be undertaken at Cleethorpes, near Grimsby, in order to make that place into a fashionable seaside resort. The enterprise has been started by Sir Edward Watkin, bart. The plans accepted for the works at Cleethorpes are those of Mr. H. B. James, C.E., of Westminster, which provide for improvements along the flats, and the reclamation of tracts of land between Grimsby and Cleethorpes, and along the coast toward Humberstone. The plans include a promenade and roadway from Grimsby to Cleethorpes, and Sir Edward contemplates carrying on the line of railway from Cleethorpes to Humberstone, and thence doubtless it will eventually be carried to Skegness.



# THE HOLLOWAY SANATORIUM AND THE HOLLOWAY COLLEGE.

VIEW OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon last a number of the members of the Architectural Association visited these extensive buildings, which owe their existence to the princely munificence of Mr. Thomas Holloway. Mr. W. H. Crossland, the architect, assisted by Mr. George Rogers, the clerk of works, very kindly received the visitors, and conducted them over the Sanatorium, which is situated near Virginia Water, and is intended to accommodate 250 inmates. The institution is for the treatment of mental disorders, one side being appropriated for ladies, and one side for gentlemen. It is intended only for professional men and others belonging to the middle-classes whose minds have been temporarily over-balanced by over-work or unforeseen troubles. Each patient will pay for his or her maintenance, so that the Sanatorium will be self-supporting. Any patient not cured within twelve months will have to find accommodation elsewhere. The Sanatorium, as Mr. Crossland pointed out, consists mainly of what are really two terraces of houses, one terrace on either side of the Recreation Hall. Each house is arranged for a family or household of ten persons, besides attendants, and communication between the houses will only be by pass-doors for convenience of supervision. The stairs are arranged in short flights, and without well-holes, for obvious reasons. The roof of the Recreation Hall has been very effectively decorated from the designs of Mr. Moyr Smith, to whom Mr. Crossland expressed his indebtedness for the way in which the effect of his roof had been heightened. The staircase leading to the Recreation Hall has also been very effectively decorated. In the *Builder* of the 7th of January last we gave a double-page interior view of the Recreation Hall, of the Sanatorium, accompanied by a general description of the buildings. It was at that time supposed that this fine range of buildings would be ready in May for the reception of patients, but consequent on the elaborate and effective manner in which the principal rooms have been decorated, and, to some extent, owing to the time required in giving effect to Mr. Holloway's determination that the building should be furnished, lighted and heated, and fitted in the best possible manner, entirely regardless of cost, more time has been required than was at first anticipated, many changes and improvements having in the meanwhile suggested themselves to the founder, such as the introduction of colour into the then plain glazed windows of the day-rooms, libraries, and other rooms. In the account of the building which we have formerly given, we mentioned the number of rooms in the building (480); to this information in the shape of statistics we may here put on record the fact that the number of windows is 1,053. The total length of the building is 530 ft., the depth from back to front being 216 ft. Costly pictures and excellent engravings are being hung on all sides of the numerous day-rooms throughout the building, which are tastefully furnished and decorated, hardly any two being alike. The extensive laundry is being fitted up with the latest and most approved appliances for laundry purposes, and the whole will be worked by costly machinery. Messrs. J. & F. May & Co. and Messrs. Thomas Bradford & Co. have done much work in this department of the building. Messrs. May & Co. have also supplied the large steam cooking apparatus in the kitchen. The principal joinery work in the building was done by Mr. W. H. Lascelles, of Bunhill-row, the deal fittings being by Messrs. Aviss & Co., of Putney. The general contractors were Messrs. Sharpington & Cole. The cost of the building, including furniture, has been about 300,000l. The building will, it is expected, be opened for the reception of patients some time during the autumn of this year. To the present brief notice of the building we may add that in our volume for 1877 (p. 712) we gave a two-page view of the building; while two years earlier (in our volume for 1875) we gave an enlarged view of the central portion of the building, comprising tower and exterior of recreation-hall, together with a plan of the whole building (pp. 645-47).

The visitors, after partaking of light refreshments, proceeded to Virginia Water and viewed the artificial ruin constructed with columns of marble and granite brought from Greece. The

weather was, however, very unpropitious, a heavy and continuous fall of rain drenching most of the visitors to the skin. After taking shelter for a time at the Wheatsheaf Inn, the majority of the visitors proceeded to

*The Holloway College for Ladies, near Egham.*

—In the *Builder* for October the 8th last we gave a description of some parts of this enormous building, then, as at present, in course of erection. At the same time, we published a two-page illustration of a portion of the east quadrangle. The building, we may say, forms a double quadrangle, 500 ft. from east to west, and 350 ft. from north to south. It is intended to accommodate 350 students. There were at the time we wrote about 800 men employed on the building. From the details which we then gave we omitted some particulars that may be worth mentioning. There were then, for the purpose of facilitating the work of the contractors, more than 3,000 yards in length of tram-road in and around the building; seven powerful steam derrick cranes, and eleven hand-cranes, were fixed upon the building for lifting the materials; sixteen two-ton hand-travellers were in use for fixing the heavy masonry; a ten-ton steam traveller, of 60 ft. span, conveyed the enormous blocks of Portland and Bath stone to the extensive range of steam-sawing machinery, and thence to the numerous stone-working machines and to the "bankers" of over 320 masons. There are at present nearly 500 men employed upon the building. As we have named the number of rooms and windows in the Sanatorium, we may add that in the College building, as comprised in the present contract, there are 858 rooms, 1,912 windows, and 760 fireplaces. For more detailed particulars of the building, and for an account of the intentions of its founder in regard to it, we must refer our readers to our number for October 8th last. We will only add here that the contract with Mr. John Thompson, of Peterborough, for the completion of the work, was signed on the 30th of July, 1879, and it is expected to be completed in about a year from the present time. In Mr. George Rogers, who has been clerk of the works at this building since its commencement, Mr. Crossland has an able and courteous representative. The contractor's foreman is Mr. G. Gray. Including endowments and fittings, Mr. Holloway's expenditure on the two buildings will be about one million sterling.

Owing to the heavy rain of which we have made mention, the progress of the visitors over the College works was greatly delayed, and after a hurried inspection of only a fractional part of the extensive building, the members, conducted by Mr. Crossland, who is the architect of both the buildings named, sat down to an excellent cold collation, in a tent tastefully decorated and arranged under the especial supervision of Mrs. Crossland.

## THE NEW EXAMINATION SCHOOLS, OXFORD.

THIS building, fronting the High-street, a little below University College, which has been six years in construction, was finished in the middle of May, just in time to allow of its being used for the summer examinations of the University. Hitherto the schools and the Bodleian Library have shared one building between them, but the growth of the library having rendered the continuance of this time-honoured arrangement impossible, land was secured, at a cost of 40,000l., partly on the site of the Angel Hotel, having a north frontage to High-street, and extending eastward to King-street and Southward to Merton-street. The site having been secured, five architects were invited to send in plans, and the delectable appointed by Convocation to deal with the subject selected those submitted by Mr. T. G. Jackson, which were finally approved by Convocation on June 15th, 1876. The building was begun forthwith, and has been continued without interruption till its completion a few weeks ago.

The plan has been to a certain extent influenced by the existence of unexpired leases on some of the tenements standing upon the site, which the University was not able to buy up on reasonable terms. One house in King-street, in an apparently half-ruined condition, still stands in the middle of the new quadrangle, as a monument of this difficulty, and another which adjoined it, has only just been removed.

The building had, therefore, to be planned so that the whole or the greater part should stand on ground which the University had in hand, and in Mr. Jackson's design this was managed by leaving the interior quadrangle open at the east side, facing King-street, where it will eventually be enclosed by an iron railing, with stone piers. The internal arrangement is very simple. The twelve schools for *viâ voce* examination and the three for examination on paper are contained in a building forming three sides of a quadrangle, the fourth side, as has been explained, remaining open. For the most part the *viâ voce* schools are placed on the ground floor, looking inwards to the quadrangle, and surrounded by a spacious corridor of communication, which runs along the back of the buildings, while the three large writing-schools are placed upstairs, and occupy nearly the whole of that floor. Between these buildings and High-street an additional building is interposed, containing a large entrance-hall in the centre and rooms for officials in the wings. By this arrangement that perfect quiet which is so necessary at examinations is secured to the schools, which look inwards, and are further protected from noise in High-street by the great hall and from noise in Merton-street by the houses and gardens which are left standing on that side. The main entrances are in High-street and Merton-street. From High-street a vaulted porch admits at once to the great hall "*des pas perdus*," which is 69 ft. long, 27 ft. wide, and 48 ft. high to the crown of the ceiling. The main timbers of the roof and the panelled ceiling are of oak, and the walls are lined with oak wainscoting to the height of 18 ft. Three large mullioned and transomed windows in the north wall light the hall, two of which are 26 ft. in height, and the south wall is pierced by three large arches under a projecting gallery of stone, carried by vaults springing from carved brackets. The floor is of black, white, and grey marble, surrounding compartments which will be filled with mosaic now being prepared in Paris from the architect's designs. The three arches under the gallery open into the corridor of the north wing, which is continued along the south and west wings, passing at each of the two angles through a secondary waiting-hall, from which open the doors of several schools and a passage to the quadrangle. In the south-west hall also is the entrance from Merton-street. The ceiling of each of these halls is carried by two marble columns, those in the north-west hall of a particularly beautiful variety of Italian Breccia, those in the other of Cipollino,—a marble with green veins on an ivory-white ground, not unlike the section of an onion, a resemblance to which it owes its name.

The *viâ voce* schools are rooms, 15 ft. high, of various forms and sizes, varying in area from 760 to nearly 1,100 superficial feet. They are panelled to a certain height with painted deal, and furnished in the simplest way with a large table and chairs, the time-worn and ink-stained furniture of the old schools having been pressed into the service so far as it would go. To most of the schools a smaller room is appended, for the use of examiners who may wish to retire in order to discuss or read papers without interruption. Through these rooms examiners have their own entrance to the *viâ voce* schools, while the candidates and their friends, who will be permitted as heretofore to witness their performance, will enter from the public corridor.

The writing-schools, together with their two ante-rooms, form a suite of rooms, 27 ft. high, of the full width of the building, extending round very nearly the whole three sides of the quadrangle, and communicating by large archways with doors, which can be slid back out of sight. Their combined length is 444 ft., with a width of about 34 ft., and their floor-space exceeds one-third of an acre,—an area which is, perhaps, not surpassed by any suite of rooms in the kingdom. The ceilings are of ornamental plaster work, and the lower part of the walls is panelled with oak. The two larger of these rooms are planned each to accommodate 200 candidates, seated at separate tables, with an area of 25 square feet per head, and the third room will hold 120 at the same rate.

The quadrangle, when completed by its eastern fence, will measure 170 ft. by 105 ft. It has four doors to the interior of the building, and will have carriage-gates towards King-street, to be used in case of entertainments or receptions by the university.

The central feature of the quadrangle is the



tower, which rises to the height of 78 ft., and is designed to contain in the upper part a clock and bells. All the schools, passages, and ante-rooms are warmed and ventilated on Messrs. Haden's system.

The building is designed, in the words of the architect's original report, "in that late eclectic style of Gothic, of which Oxford and Cambridge contain admirable examples, so many, and so thoroughly well worked out, in detail, that they almost constitute an academical style by themselves."

The stone chosen for use at the new schools comes from Clipsham, in Rutland, and is practically identical with the famous Barnack rag.

Exclusive of the cost of the site, architect's charges, and clerk of the work's salary, but including all the carving, marble work, and other decorations, and such new furniture as has been required for the present examinations, the building has cost in round numbers, 98,400*l.*, which is at the rate, we are told, of less than 12*d.* a cubic foot.

Mr. Estcourt was the general contractor for the works; Messrs. Farmer & Brindley executed the carving and marble work; Messrs. Haden supplied the warming and ventilating apparatus; and Mr. Shepherd furnished the electric clocks and bells. Credit has been given to Mr. R. Edwards, the clerk of the works, for his careful superintendence from first to last.

#### THE CENTRAL FREE LIBRARIES, BIRMINGHAM.

THE new buildings which have been erected in consequence of the destruction of the old building by the terrible fire of January 11th, 1879, were opened on the 1st inst. by Mr. Bright, as we briefly stated last week. The buildings destroyed on that occasion, part of the original block designed by the late E. M. Barry for the purposes of the Midland Institute, had long been inadequate to the growing needs of the Birmingham Library, and at the time of the fire, works were actually in progress for their enlargement. The enlargement then projected, however, was of a merely piecemeal and makeshift character. It was not until the old building had been destroyed that the public awoke to a recognition of its radical defects, and acknowledged the need of a new structure on a more modern plan and a more extended scale. The library restoration fund soon assumed proportions which enabled the Free Libraries Committee, with the sanction of the Town Council, to modify and enlarge very considerably their original plans for the reconstruction of the building.

The site, and to some extent the elevation of the new structure are substantially the same as those of the building it replaces. The former, which is in the very heart of the town, adjoining the Midland Institute and facing on different sides the Town-hall, the Mason Science College, the Chamberlain Memorial Fountain, and the new Birmingham Art Gallery now in course of erection, could hardly be changed with advantage, and the Classic elevation of the principal or eastern front is necessarily governed by that of the Midland Institute with which it ranges. On the northern, or Edmund-street side, however, where the building is entirely new, the architects, Messrs. Martin & Chamberlain, have provided a lofty two-story elevation in the Italian style, composed of stone and red brick, with polished red granite columns, terra-cotta arches, and mosaic panels. The lower story (we quote from the *Times*) is occupied by five lofty and deeply-embossed windows, carrying terra-cotta moulded and decorated arches, and divided by red brick piers and granite columns. Over the windows, which are in two heights, with sub-arches of stonework, runs a wide band of panelling, the spaces filled in with terra-cotta work with mosaic centres, and painted tiles for the borders. Three large carved stone niches, carried on pilasters, for the reception of statues, constitute the leading feature of the ornamentation of the upper story, and above the niches runs a deep, bold projecting cornice enriched with mosaic work, the whole being surmounted by an arched parapet of stonework. Brickwork panels filled in with painted tiles and arched over with terra-cotta take the place of niches in the upper part of the wings, and the tympani of the windows in every case are filled with tile panels. The principal entrance, from Ratcliff-place, is

through a portico, or prostyle, of granite piers, 32 ft. in width by 12 ft. in depth, which gives access through wrought-iron gates to the vestibule and hall. The latter, which is separated from the vestibule by a glazed oak screen, carried on polished granite piers, is 28 ft. wide by 60 ft. in length and 45 ft. high. From the hall, which is tiled, the visitor passes by a lofty, double-arched doorway, the heads of which are filled with alabaster and Caen stone, arranged in patterns with medallions of painted tiles, into the newsroom and lending library, which are divided from one another by a series of lofty painted iron pillars. The newsroom is 100 ft. in length by 64 ft. wide, and the ceiling, composed of brick arches with moulded panels, is carried on iron columns with large foliated brackets at a height of 26 ft. The general dimensions of the lending library are 82 ft. by 75 ft., but a portion of this space at two angles is occupied by the librarian's room and staircase, and other offices. In the lending library the whole of the wall-space not occupied with windows is fitted with bookshelves, affording accommodation for 22,500 volumes, to which access is obtained by a double gallery and staircase of metal work. Returning to the entrance-hall, the visitor ascends to the reference-library, on the upper story, by a wide and handsome staircase, lighted by three large mullioned windows filled with stained glass, and carried to about two-thirds of its height on a series of piers and arches of buff terra-cotta. The ceiling and walls of the staircase are richly panelled and decorated with pressed bricks, terra-cotta, and wall-tiles, and the staircase itself is protected by an ornamental iron balustrade. The reference-library is a noble room, or rather suite of two rooms, on the plan of the letter L, divided by granite piers carrying lofty arches. The principal room is of the same dimensions as the newsroom below, viz., 100 ft. by 64 ft., and is subdivided into a centre and aisles by a series of granite piers and columns, carrying arches of Ancaster stone. Above the arches runs a range of clearstory windows filled in with stained glass. A series of groined arches connect the clearstory windows with the ceiling, which rises to a height of 50 ft., and consists of brick arching, carried on semicircular iron ribs, the surfaces of which are panelled and ornamented with foliation of conventional designs. The piers and columns have metal capitals and bases, the former enriched with gilding, and the metal work is open, showing the polished granite beneath. At right angles to this room is the wing, or second division of the reference library, measuring 82 ft. by 45 ft. It is roofed in one span with an elliptical roof, arched in brickwork, and carried by a series of wrought-iron ribs, at a height of 42 ft. This room, which is to be used temporarily as an art gallery, pending the completion of the permanent art gallery before alluded to, will be devoted for the present to the exhibition more particularly of the Nettlefold bequest of pictures by David Cox, and the pictures by Müller, presented by Mr. Chamberlain, M.P. Opening out of the reference library is the Shakespeare library, a comparatively small apartment 30 ft. long by 21 ft. 6 in. wide, decorated appropriately in the Elizabethan style, and between this and the librarian's staircase, which connects the upper and lower libraries, are a series of strong-rooms, with iron fittings, for the preservation of the more valuable books in the collection. The arrangements for artificial lighting, effected by means of improved gas-lamps and sun-lights, ignited simultaneously by electricity, were entrusted to Messrs. Strode, of London. The heating apparatus, which combines the advantages of hot air and hot water, is supplied by Messrs. Haden & Son, of Trowbridge. The tile panels and wall-linings are by Minton, and the tile pavings by Minton Hollins, & Co. Messrs. Salviati & Burke have supplied the mosaics, the Horsley Company the girders and structural ironwork, Messrs. Hawkes the stained glass, Messrs. Hardman the entrance-gates, Messrs. Barnsley & Son and Mr. John Webb, the general fittings, Mr. Barfield executed the carving, and the contract for the buildings has been carried out by Messrs. Horsley, Mr. E. Grimes being the clerk of works.

Architecture at the "Salon."—The medal of honour has been awarded by eleven voices, out of twenty-two voting, to M. Paulin, who took the *pris de Rome*, 1875. He exhibits drawings of the Baths of Diocletian and the Portico of Octavia.

#### NEW FREE LIBRARY, CARDIFF.

THE new building in Trinity-street and Working-street, erected as a Free Library and Museum, with Science and Art Schools attached, was opened on the 31st ult. by the Mayor (Mr. Alfred Thomas), who was accompanied by a large number of the residents of the town, &c.

The building has been erected from plans prepared by Messrs. James Seward & Thomas, of Cardiff, and selected by the Science and Art Department from about 100 sent in in competition for a premium of 100*l.* The principal elevations, those facing Trinity-street and Working-street, are in the modern French Classic style. These fronts are formed entirely with Bath stone, with yellow bricks to the flanks and roof. The ground-floor consists of library, newspaper-room, magazine-room, reference library, and alcoves for reading, as well as spaces enclosed for ladies should they desire to remain to read any of the periodicals or books. The library, with the gallery above, contains space for 100,000 volumes, and this could be enlarged if required. The upper floor contains the museum, art-gallery, and the several rooms required by the students of the science and art schools. These are reached by the entrances in Working-street, the entrances for males and females being quite distinct. There are also detached rooms which can be used as lecture-rooms for students, but no one large enough for a general lecture-room. The plans were prepared in accordance with a resolution that the building should not exceed in the cost of erection 8,000*l.* Mr. Roberts, contractor, undertook the contract for that sum, but failed to carry it out, and the building was subsequently completed by Mr. F. S. Lock, builder, the difference in the cost being paid by the surties of Mr. Roberts, except such extras as had been ordered by the Corporation; but the entire cost of the building, it is expected, will not exceed 10,000*l.* Since its commencement numerous presentations have been made by various parties. Mr. James Ware has given a stained-glass window for the reference library; four other stained-glass windows have been given by members of the Corporation. The Foresters' Courts at Cardiff gave 100*l.*, and the Oddfellows 50*l.*, for stained-glass windows. The committee of the Cardiff Fine Arts and Industrial Exhibition gave 800*l.* for the decoration of the corridor leading to the museum, the floor of which is laid with encaustic tiles, and the walls covered with panels of majolica, containing various designs. They also presented the library with the carvings in stone over the Trinity-street entrances and windows, and which are fitted into spaces left for the purpose. These have been executed by Mr. R. B. Boulton, of Cheltenham, while the designs for the principal stained-glass windows were drawn by Mr. E. Weeks, of London.

#### A STRUCTURAL CONTRIBUTION TO BATTERSEA PARK.

An interesting structure from Ireland is about to be erected in or near Battersea Park. Mr. J. O. Lever, M.P. for Galway, has purchased the glass portion of the Dublin Exhibition Palace, with the intention of transferring it to Battersea Park, where he proposes to re-erect it as a portion of an additional building in the grounds of the Park for the instruction and entertainment of the public. Mr. Lever has made arrangements with the British and Irish Steam Navigation Company for the conveyance of the materials to London, which are expected to arrive in a few days. It is stated that the stonework of the building has been purchased by the Dublin Royal University authorities.

"The Potteries," Notting Dale.—At the meeting of the Metropolitan Board of Works on the 26th ult., a letter was received from the Vestry of Kensington, calling attention to the necessity that exists for providing an open space or recreation-ground in the neighbourhood known as "The Potteries," Notting Dale, stating that an opportunity presents itself for acquiring a piece of land, about three acres and a half in extent, on the west side of Pottery-lane, and requesting the Board to take the necessary steps for acquiring the land for the purpose named at as early a date as possible. The communication was referred to the Works Committee for consideration and report.



SUGGESTED REBUILDING OF  
VAUXHALL BRIDGE.

It is generally known that amongst the improvements which are about to be effected in several of the metropolitan bridges, that at Vauxhall is about to undergo alterations, and to be, to a certain extent, reconstructed. At present the bridge is very narrow, whilst the gradients are steep, and an effort is being made by the inhabitants of Vauxhall and the Wandsworth-road districts to induce the Metropolitan Board of Works entirely to rebuild the bridge instead of simply repairing and altering it. The Vauxhall and Wandsworth-road Tradesmen's Club have addressed a communication to the Metropolitan Board, in which they state that in consequence of its limited width the bridge is at present a very inconvenient structure, and that having in view the greatly increased traffic over the bridge since the time when it was thrown open free of toll, it is absolutely necessary that an entirely new and much wider structure should be erected, in order to meet the public requirements, which the existing bridge does not supply.

## THE COLOUR OF BRICKS.

The *Thon-Industrie Zeitung* remarks that the clays used in the manufacture of ordinary wall bricks are divided into two classes,—that containing lime and that free from that substance. The former class includes those clays which change under a high temperature into yellow or white, from the red colour which they acquire with a moderate degree of heat. The latter kind embraces the clays which always burn red, although in various gradations of that colour. As the proportion of lime varies from the smallest appreciable quantity to 30 per cent., it may be fairly concluded that there exists in many cases a small admixture of lime, which prevents the production of a uniform bright red colour in certain cases where the cause of the failure of certain makers to produce this shade is not readily apparent.

## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 2,530. H. Ransford, Brighton. Domestic stoves, &c. May 27, 1882.  
2,540. G. F. James, London. Furnaces or fire-grates. May 27, 1882.  
2,541. P. Ross, Harrow. Architectural work, &c. (Comp. spec.) May 30, 1882.  
2,549. T. Hyatt, London. Building construction, &c. May 30, 1882.  
2,556. G. L. Reynolds, Oaklands, U.S.A. Window-screens. May 30, 1882.  
2,590. T. H. P. Dennis, Chelmsford. Method of system of glazing, &c. June 1, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

May 30, 1882.

445. J. Jaffrey, Manchester. Domestic fire-grates and stoves, &c. Jan. 28, 1882.  
469. J. Parkinson, Caton. Construction of boilers and furnaces for heating buildings by hot water. Jan. 31, 1882.  
505. J. D. Brunton, London. Apparatus for dressing, &c., stone. (Partly com. by F. H. J. Trier, Boston, U.S.A.) Feb. 1, 1882.

June 2, 1882.

918. H. J. Haddan, London. Ventilators. (Com. by F. Millan, Massachusetts, U.S.A.) Feb. 25, 1882.

## ABBREJMENTS OF SPECIFICATIONS.

Published during the Week ending June 3, 1882.

- 4,102. A. Bedborough, London. Window sashes and frames.

To afford means of ventilation without opening the window the upper sash is made higher than the opening in the casement it covers, and a chamber in the soffit of the window-frame receives the excess height. This can be lowered a little way, and the parting of the horizontal sash-stiles provides the ventilation. The sashes are also suspended in the centre to pivot in the pulley-stiles. Sept. 23, 1881. Price 6d.

- 4,425. T. Stokoe, Headingley. Heating rooms, greenhouses, &c.

A succession of hot-air tubes are arranged, the air in which is heated in a chamber by gas flames. These air-

tubes are surrounded by others, as is also the chamber, and in the annular space between the two is water. Oct. 11, 1881. Price 6d.

- 4,578. W. A. Barlow, London. Self-feeding base-burning, air-heating, and ventilating stoves.

Above the basket-shaped grate is the feeding-funnel, by which the fuel is delivered to the grate as it is burned. A mantle is formed round the stove, in which the air is heated as it passes through. (Com. by F. Loholst, Frankfurt.) Oct. 19, 1881. Price 10d.

- 4,595. J. G. Chillingworth, London. Sash-fasteners.

A hinge-like appliance is fixed to the lower rail of the upper sash by one flap, and the other is turned over on the lower sash, when a sliding-bolt on this lower sash passes over the flap and secures it. Oct. 20, 1881. Price 4d.

- 4,648. H. J. Haddan, London. Tiles.

These may be made of any material, but are of rhombical shape, and are placed in a diagonal position on the slope of the roof. Two adjacent sides are provided with flanges that curve in one direction, while on the other two sides the flanges curve in the opposite direction. By these they are secured together. (Com. by A. Vailland, Blanquefort, France.) (Pro. Pro.) Oct. 24, 1881. Price 2d.

- 4,656. T. H. Rees, London. Manufacture of glass tiles, &c.

The tiles are ornamented on one side, and two tiles are joined together by patty, with the ornamented faces inside, and then dried. Thin metal plates are then inserted between the two tiles, which are secured in the required position by the projecting parts of the metal. Oct. 25, 1881. Price 2d.

- 4,665. H. J. Haddan, London. Doors and windows.

A strip slides in the weather-rail of the window, and can be depressed by a lever, thereby making the joint tight. (Com. by F. Fournier, Tourcoing, France.) (Pro. Pro.) Oct. 25, 1881. Price 2d.

- 4,692. J. Benson and T. Wainwright, Southampton. Apparatus applicable to doors and windows for excluding draughts, &c.

A plinth is constructed with a groove in which a sliding-piece is fixed. Springs draw the sliding-piece into the groove, and a lever forces it out when required. (Pro. Pro.) Oct. 27, 1881. Price 2d.

- 4,698. R. Brealey, London. Chimney-caps.

Two exits are made for the smoke, one at the top and the other at the base of the cowl, and the adjoining surfaces are curved to deflect the wind outward. (Pro. Pro.) Oct. 27, 1881. Price 2d.

- 4,712. C. Egar, Bradford. Ash-pans.

The upper portion of the body is flat and slopes forward, and radiating apertures are formed therein to allow the ashes to drop through into the pan. A curved slide with corresponding apertures closes or opens the apertures. Oct. 27, 1881. Price 4d.

- 4,725. H. Skerrett, Birmingham. Apparatus for flushing water-closets, &c.

A siphon is formed in the cistern, which has a flattened bend. The ball-valve allows the cistern to be filled up to the level of the lower edge of the bend, and when it is required to flush the closet, a displacer descends into the water, causing it to fill the bend and set up the siphonic action which empties the cistern. Oct. 28, 1881. Price 6d.

## VALUE OF PROPERTY IN EASTCHEAP.

## THE INNER CIRCLE COMPLETION RAILWAY.

A COMPENSATION case in connection with the completion of the Inner Circle Railway was investigated last week at the Institution of Surveyors, before Mr. G. Pownall, as arbitrator. The plaintiffs were *Lancaster Trustees*, and the defendants the Metropolitan and Metropolitan District Railway Companies. The property, situated in Eastcheap, is required for the construction of the Inner Circle Completion Railway, and the making of the new street. It is freehold, and let on a lease terminating in 1886, at a rental of 650*l.* a year.

Mr. F. F. Fere, on behalf of the plaintiffs, said he considered that at the termination of the lease in four years, the property would be worth 1,050*l.* a year. He took the area of the land, 1,700 ft., at 10*s.* per foot per annum, and the value of the building at 3,333*l.*, interest on which, at six per cent., would be 200*l.* a year, making altogether 1,050*l.* a year. "Twenty years' purchase on this would amount to 21,000*l.* Including the usual percentage for compulsory purchase, he thought the lowest value of the property was 21,468*l.* Mr. Chaffell Clarke, on the same side, estimated its value at 21,371*l.*; and Mr. V. Buckland at 21,780*l.*

For the defendant companies, Mr. Farmer, of Messrs. Dobson, Tewson, Farmer, & Co., considered that the value of the property was 16,115*l.* His opinion was that the full rental value was 650*l.* a year for the property as it now existed. As land, if the present buildings were taken down, he should think that 700 ft. would be worth 10*s.* a foot, and 650 ft. 5*s.* a foot per annum, or 600*l.* per annum for the whole. Mr. Trist, of the firm of Messrs. Norton, Trist, & Co., said he agreed with Mr. Farmer's valuation.

The Arbitrator reserved his award.

Lord Zetland is about to build a new training establishment and residence at Newmarket. The work is to be carried out by Messrs. Clark & Moscrop, architects, Darlington.

## OBTAINING TENDERS FROM BUILDERS.

SIR,—Will you, or some of your readers through your medium, kindly inform me if I am entitled to claim remuneration under the following circumstances?—

An architect wrote to ask if I would tender for an addition and repairs to a large house. I consented, and plans and specifications were forwarded. No quantities were supplied, and it occupied two clerks three days to take them out. My tender,—nearly 4,000*l.*—was the lowest, but the job has been given to the one whose tender was next above mine.

I may mention that a clause was inserted that the lowest or any tender would not necessarily be accepted. But as I was invited and was prepared, if desired, to deposit sufficient security, it appears to me that I should be justified in claiming, say one per cent., for getting out quantities, or else what protection is there for builders against architects who put them to the trouble of getting out estimates simply to check the price of the man whom they intend shall have the job?

ONE WHO HAS BEEN DUPED.

\*\*\* We agree with our correspondent, and have always said so, that if a builder be invited to tender in competition and his offer be the lowest, it should be accepted. It is, otherwise, like subscribing to a raffle for a watch, and afterwards finding out there is no watch in the case. Builders should have this made clear before commencing their estimates. In the present instance the clause that no tender would necessarily be accepted, would probably prevent the enforcement of any claim.

## THE TEMPLE ROOF.

SIR,—When in the British Museum this morning, I noticed a slab, No. 176, 3rd Græco-Roman Room, containing a relief, on a tolerably large scale, of an antique roof, which exhibits the tiling and wooden construction very distinctly. If you have not already scanned this relief I would venture to call your attention to it, as it might possibly help to a right conclusion with regard to the mechanism of classic roofs.

I recollect suggesting that the Grecian temples might have been lighted with thin slabs of white marble, which would have diffused "a dim religious light." If these were let into grooves in the rafters, it may have been found easier to have formed the grooves in a plank than in a solid beam; the grooved planks might then have been combined with an ungrooved centre one to obtain sufficient strength, as, I believe, Mr. Fergusson has suggested. The roof in the relief referred to is, however, covered with tiles. W. C. T.

## HOW DOES IT HAPPEN?

SIR,—Reading the remarks in your last number upon the "Illustrated Catalogue of the Salon of 1882," and Mr. Blackburn's "Academy Notes," I was set thinking upon what apparently is a most extraordinary coincidence, and which I have not seen remarked upon in any paper. I refer to the singular and accurate resemblance that exists in two pictures, the one to the other. Compare the etched engraving in the catalogue of the French Salon, p. 216, of the picture entitled "À la Plus Belle," and painted by Mons. G. Fraipont, with the picture exhibited at the Royal Academy, numbered 852, and entitled "The Queen of the Revels," by Francesco Viner.

The two pictures are identical in composition, and some explanation of this similarity by two distinct artists might be agreeable and instructive to the lovers of art.

EDWARD POWER.

**Stationary-Power Tramways.**—The motive power allowed by the provisional order of the Board of Trade for the proposed Highgate-hill tramways is that of wire ropes placed under ground and worked by stationary engine power under the "Hallidie system." The maximum speed allowed on the tramway is fixed at eight miles per hour. The tramway will commence at the Archway Tavern, in the Holloway-road, at the foot of Highgate-hill, and will end opposite Southwood-lane, in Highgate. Between Southwood-lane and Sir Sydney Waterlow's house (Fairseat) there will be a single line only.

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.



## STAINED GLASS.

**Ten.**—The west window of North Curry Church, near Taunton, has recently been filled with a stained glass window, in memory of the late vicar, Rev. C. R. Harrison, who was a prominent member of the committee of Compilers of "Hymns Ancient and Modern." It contains a portrait of him and also of his son, who was killed when acting as adjutant to his regiment, the 94th, at the commencement of the war with the Boers. The window, which is a five-light one, is illustrated by the subject of the "Te Deum." The window was designed and executed by Messrs. Heaton, Butler, & Bayne, Garrick-street, London.

**Ashton-upon-Mersey.**—A Munich window of five lights (east) has lately been erected in the Church of St. Mary Magdalene, Ashton-upon-Mersey; each compartment containing a separate subject illustrative of some passages in the life of the Saint. The window is in memory of Sarah, wife of Mr. Frederick Fielder, Whitefield House, Ashton-upon-Mersey, and of their elder son, Frederick Rodolph, and is the gift of Mrs. C. B. Hobbs, of Waterloo, Liverpool, and Mrs. R. Heath, of Greenway Bank, Stoke-upon-Trent, daughters of Mr. Fielder. The window is from Messrs. Mayer & Co.

## Books.

**Worked Examination Questions in Plane Geometrical Drawing.** By F. E. HULME, F.L.S., F.S.A. London: Longmans & Co. 1882.

**Worked Elementary Examples in Geometrical Drawing.** By the Rev. JOHN HUNTER, M.A. London: Longmans & Co. 1881.

THE object of these two works is nearly the same; it is to familiarise students with problems in preparation for examinations. In Mr. Hunter's book, which is much the smaller one, and is more elementary, the object is stated to be "to direct and assist the practice of candidates preparing for examination"; Mr. Hulme more specifically states his object to be "the assistance of candidates preparing for 'the Royal Military Academy, Woolwich; the Royal Military College, Sandhurst; the Indian Civil Engineering College, Cooper's Hill; Indian Public Works and Telegraph Departments; the Royal Marine Light Infantry; and the Oxford and Cambridge Local Examinations.'" Mr. Hulme's volume is put together in a manner very valuable for self-instruction, if properly and honestly used. The problems are stated in the text, with some hints as to where the principal difficulties are to be looked for, and other remarks, appended to those which have been thought to require such comment. After the close of the text are placed the diagrams showing the working out of each problem, each diagram being engraved on the outer half of a double page, and folded back so as not to be seen until opened out. The student is recommended to do his best to work out the problem in accordance with his own instincts first, after which the diagram with the number corresponding to the problem can be unfolded, and, projecting beyond the margin of the book, can be compared with the problem in the text without any more turning over of leaves. The arrangement is a very good one; but it might have been still further improved in one small detail, if the number of the problem had been added on the back of the diagram, so as to be seen while the diagram is still folded down. As this is not done, the student must necessarily unfold some of the diagram sheets in looking for the particular number he wants, and hence will be pretty certain to get some of those hints in advance which it is the object of the author to persuade him to dispense with. The examples seem well selected, so as to exercise the student both in regard to geometrical thought, if we may use such an expression, and accuracy and neatness of delineation upon correct principles.

Mr. Hunter's book is a much smaller and less expensive one, giving the explanations and figures along with the problems. It might very well be taken, or part of it, as a prelude to the study of Mr. Hulme's problems, in so far as it is easier to learn a method set down in black and white for the student, than for the student to evolve the method himself in the first instance; so that Mr. Hunter's explanations may train him towards the exercise of the kind of thought which Mr. Hulme's book requires. Both books seem well adapted to be useful for the purpose for which they are intended.

## VARIORUM.

MESSRS. BICKERS & SON announce that they will shortly publish a work on Rome, illustrated in a series of pen-and-ink sketches by Mr. J. Tavenor Perry. The work will consist of about forty drawings, reproduced in facsimile by photolithography, on plates measuring 15 in. by 11 in., accompanied by a descriptive text. All the sketches are original, and have been made during the spring of this and last year; and include the most recent excavations and discoveries.—In "Our Homes and How to Make them Healthy," for June, Dr. Richardson says, "I have shown that the healthy house, be its construction, and I may add, be its architecture, what it may, must have for its charter of health the following seven points:—It must present no facilities for holding dusts or the poisonous particles of disease; if it retain one it is likely to retain the other; it must possess every facility for the removal of its impurities as fast as they are produced; it must be free from damp; it must be well filled with daylight, from all points that can be charged with light from the sun, without glare; it must be charged with perfectly pure air in steady changing current; it must be maintained at an even temperature, and must be free of draughts; it must be charged with an efficient supply of pure and perfectly-filtered water. A house possessing the advantages named under these heads cannot be far from a perfected healthy house. It is a house in which disease will never be generated, so long as it is kept up to its proper standard. It is a house in which disease, if it be introduced, will remain for the briefest possible period. It is a house which, after disease has left it, will admit of instant and complete purification."—We take a paragraph from *Our Own Country* on "Lincoln Cathedral":—"The cathedral commenced by St. Hugh still crowns the brow of the plateau above the Witham, unchanged in its leading features, except the later adornment of its triple group of towers. He, indeed, was not able to bring his task to completion, but the work was steadily continued by his immediate successors; so that the greater part of the cathedral was built during the thirteenth century, and bears the impress of the original designers. Indeed, the south end of the great transept, and the upper part of the western towers, which dates from about 1450, are all the important portions that are subsequent to the year 1300, so that the cathedral is in the main an Early English structure. Lincoln has, then, an especial interest as being 'one of the first important buildings erected wholly in the Pointed style.' Though less complete in some respects than Salisbury (begun in 1220 and finished in 1258), it was commenced full thirty years earlier. Some critics have asserted that the architecture of Lincoln exhibits signs of a French influence; but the late M. Viollet-le-Duc, 'whose authority on this point scarcely admits of dispute, has declared that, after the most careful examination, he could not find in any part of the cathedral of Lincoln, neither in the general design, nor in any part of the system of architecture adopted, nor in the details of ornament, any trace of the French school of the twelfth century, so plainly characteristic of the cathedrals of Paris, Noyon, Senlis, Chartres, Sens, and even Rouen. This fact, which greatly increases the probability that the architect, Geoffrey de Noiers, was an Englishman, gives us good reason to claim for St. Hugh the distinction of having been 'the first effectual promoter, if not the actual inventor, of our national and most excellent Early English style of architecture,' and in point of interest renders it difficult for any other church to exceed Lincoln Cathedral."—The publishers of "Holiday Handbooks" have issued "A Trip to the Ardennes," the first of a series which will embrace some less frequented districts at home and on the Continent. At the price of 1d. the series may be considered a timely addition to the more costly handbooks before the public.

—Messrs. Houghton, Mifflin, & Co., of Boston and New York, announce that they have in the press an *édition de luxe* of the "English and Scottish Popular Ballads," edited by Francis J. Child, Professor in Harvard University. The popular ballads existing in the English language, though their merit has been amply recognised, have never been collected into one body. Each ballad will have a proper preface, and in the case of those ballads which the English have in common with other nations, an account will be given of related traditions. Mr.

Henry Stevens, 4, Trafalgar-square, London, the well-known bibliographer, acts in England as the agent of Messrs. Houghton & Co.

## Miscellanea.

**Discoveries in Rome.**—The *Times* correspondent in Rome, June 1, gives interesting particulars of the discovery, near the Temple of Vesta, of another portion of the celebrated marble plan of Rome, which is believed to have been drawn in the time of Septimius Severus and Caracalla, and which is known as the Pianta Capitolina, from the circumstance that the portions of it found in the time of Paul III. behind the Basilica of Saints Cosma and Damiano, together with a few other pieces discovered in the same locality in 1867, are framed in panels on the staircase walls of the Capitoline Museum. Strangely enough, the fragment recently discovered refers to the locality where it was found, but unfortunately it was necessary to suspend the excavations on the Forum side, at the very edge of that small area delineated upon it, which extends under the modern roadway 35 ft. above, and where the little Church of Santa Maria Liberatrice stands. The excavations have, indeed, been recommenced on the Palatine side of the roadway, and will finally be connected with those on the Forum, but many interesting revelations, as even a few weeks' work may effect, it will not be until the very last, when the roadway and the church are removed, that archaeologists can hope to see the verification of what is drawn on this precious bit of marble. The fragment shows the south-east posterior corner and six of the ten columns of that side of the Temple of Castor, with the name inscribed along it,—the C and half of the A being wanting,—and it nearly completes the piece on the Capitoline staircase, which gives the front and west side of the temple, with a portion of the Basilica Julia next to it, and the Vicus Tuscus passing between them.

**Social Science Association.**—As the association celebrates this year the twenty-fifth anniversary of its foundation, special efforts are being made to secure the presence of a large and a brilliant gathering at Nottingham, where the twenty-sixth annual Congress is to be held in September next. In order, moreover, to further mark the occasion, the secretary of the association, Mr. J. L. Clifford-Smith, is preparing for the press "A Manual for the Congress, with a Narrative of Past Labours and their Results," and this work, which will be issued shortly, will not only contain valuable information as to the origin and constitution and proceedings of the association during the quarter of a century that it has been in existence, but it will also indicate the manner in which, by assiduous labours on the part of the council and committees, a large amount of practical work has been accomplished during that period.

**Artisans' Dwellings.**—Mr. Thorold Rogers, one of the members for Southwark, has just laid the foundation stone of a new block of model dwellings in Vine-street, Tooley-street, which are about to be erected by Mr. J. W. Hobbs, who has already erected several blocks of similar buildings on the site of the Queen's Bench prison. It may be stated that the site of the new buildings about to be erected in Vine-street was once the place where the Huguenots assembled for their religious services. The estimated cost of the new buildings, which will accommodate 400 families, or a population of more than 2,000 persons, is 50,000l.

**Hyde Park Corner Improvement Scheme.**—We have received a letter from Dr. Churchhill, denying the right of Mr. Ussil and Mr. Carfrae to complain in any way, and asserting that "no part whatever of their ideas was introduced into the plan" we published. We cannot, however, give further space to the discussion.

**The New Town Hall, Reading.**—To the particulars of this building, which we published last week, we may add that the Papier Mâché Company, of Wellington-street, Strand, supplied the carton-pierre decorations.

**University College, London.**—Mr. L. F. Vernon-Harcourt, M. Inst., C.E., has been appointed Professor of Civil Engineering and Surveying. Mr. Kennedy retains the Professorship of Engineering and Mechanical Technology.

**Royal Horticultural Society.**—The Society's Evening Fête in the gardens at South Kensington is fixed for Tuesday, the 13th inst.



**Exeter Constitutional Club Competition.**—This competition was confined to Conservative architects resident in Devonshire. Premiums were offered of 30l. for the best design and 20l. for the second, and nine plans were sent in. A tenth was received after the time specified, and after the assessor had returned to London, and, although it was consequently disqualified, it was exhibited with the others. The directors engaged the services of Mr. John Whichcord, F.S.A. The assessor made his report, and the directors made the award in accordance with the recommendations of Mr. Whichcord. The first premium went to Mr. Edward Webb, architect, of the Cathedral Yard, for his design bearing the motto "Primrose." The second prize was awarded to Mr. R. Medley Fulford, also of the Cathedral Close, whose design bore the motto "For Queen and Country," and the assessor selected as third in order of merit the plans marked "Exeter." Mr. Whichcord reported that the elevations of "Primrose" were French Renaissance in character, and were well designed, and very suitable for the purpose of the Club. Although he was unable to approve of all the features of the plan in that design, on the whole he thought it was the most desirable of any of those submitted, and he recommended it for the first premium. The other designs sent in bore the mottoes "Beaconsfield," "Constitution," "Constitutional," "Hallamshire," "Deo Regine Patrie," "Project," and "Quod petis hic est," the latter of which was the disqualified one. Mr. Webb's plans have been selected for the work, which it is intended to commence forthwith.

**Reredos, St. Augustine's Church, Wrangthorne, Leeds.**—This reredos, which has just been completed, was originally commenced by the late Mr. John Fraser, C.E., of Leeds, as a memorial to his wife, but his death taking place soon after the commencement of the work, it was finished by his children. The work occupies the entire wall space up to the sill of the east window. The design is divided into three compartments, the centre part or reredos proper being again divided into three panels, the middle one being filled in with a representation in Venetian mosaic of the "Last Supper"; the two side panels contain allegorical figures representing respectively the feeding of the hungry and the clothing of the naked. The whole of the reredos is executed in alabaster, obtained from the quarries at Chellaston, in Derbyshire. The panels are surmounted by carved and moulded canopy work, those over the central figure of our Lord, and the two side panels, being larger and more richly treated than the others. The interior of the church has lately been renovated. The whole of the alabaster and marble work has been executed by Mr. J. W. Appleyard, of Leeds; the mosaics by Messrs. Salvati, Burke, & Co., of London; the brass-work by Messrs. Hart, Son, & Peard, of Birmingham; and the decoration of the chancel by Messrs. Powell Bros., of Leeds. Mr. J. B. Fraser, of Leeds, is architect.

**A Music Hall Burned Down.**—On the 1st inst. a fire broke out at the Alhambra Music Hall, in Union-street, Sheffield, a building capable of holding nearly 2,000 people. Within an hour the place was completely gutted, and nothing remained of the interior except the charred remnants of the roof, stage appointments, and seating. The entertainment on the previous evening closed about half-past ten, and the premises were then examined by the manager and everything appeared to be safe. The fire is believed to have originated near the stage, but the cause is unknown. Considerable damage has been done to adjoining property. The loss is put at 15,000l., of which about one-half is covered by insurance.

**Scaffold Accident.**—Mr. S. F. Langham, Deputy Coroner for Westminster, has held an inquiry at St. George's Hospital, on Tuesday evening, relative to the death of William Moor, 47, a carpenter, lately residing in Rappall-street, Knightsbridge, who died from injuries received through falling from a scaffold at the Oratory at Brompton on the 1st inst. It appeared that the deceased was in the employment of Mr. George Shaw, the builder who is engaged in constructing the new Oratory. The deceased had occasion to walk from one part of the scaffold to another at a height of 17 ft., when one of the poles gave way, and he was precipitated to the ground. The jury returned a verdict of "Accidental death."

**Royal Albert Hall.**—The opera concert to be given here this (Saturday) afternoon, the 10th, under very distinguished patronage, is expected to be of more than ordinary excellence. It includes all the chief artists of the Royal Italian Opera, Covent Garden,—Patti, Albani, Sombirich, Nicolini, Cotogni, and others.—The French Musical Festival and Competitions, to be held here on the 20th and 21st of June, are exciting much interest.—Mr. H. H. Statham's Organ Recitals are given in the Hall every Sunday afternoon, commencing at four o'clock, and are attended by large numbers of persons.—We may add that the Fine Art Exhibition here is open daily.

**Association of Municipal and Sanitary Engineers and Surveyors.**—At the Midland district meeting, to be held at Gole, on Saturday, the 17th of June, the following will be inspected:—The North-Eastern Railway hydraulic swing bridge over the River Ouse; the hydraulic coal-boat lifts; the new docks of the Aire and Calder Navigation, in course of construction. The following papers will be read and discussed:—"Extraordinary Traffic on Highways by Tractor Engines, and the Loads they draw," by Mr. J. H. Taylor, Borough Surveyor, Barnsley; "Roadways," by Mr. James Hall, Borough Surveyor, Stockton.

**Wesley Chapel, Walsall.**—This chapel has been opened, after renovation. Additional windows have been put in at the further end from the pulpit. The decoration of the building has been designed and superintended by Mr. S. Loxton, of the Bridge. The painting and ornamentation has been the work of Messrs. Ash & Newbold, of Birmingham.

**A Moving Bog.**—An Ennis telegram reports that some hundreds of acres of bog on the estate of Mr. Ralph Withrop, in East Clare, on the afternoon of the 26th ult., commenced moving to the south-eastward, carrying before it several patches of reclaimed land under cultivation for potatoes. Part of the main road to Limerick was also destroyed.

## TENDERS

For the erection of two detached villa residences at Honor Oak, S.E., for Mr. E. P. Trenchard. Mr. W. H. Jarvis, architect.—

Contract No. 2.

Redman (accepted).....£2,150 0 0

For the erection of studio, tower, &c., to villa residence, Dulwich, for Mr. J. Henderson. Mr. R. Peters, architect, Wool Exchange, Coleman-street.—

J. Burchell (accepted).

For the erection of verandah, boundary fences, and park gates, to villa residence, Finchley, for Mr. W. T. Dippie. Mr. R. Peters, architect, Wool Exchange.—

T. Emor Julian & Co. (accepted).

For the erection of a Baptist chapel at St. Mellons, near Cardiff. Rev. E. Roberts, architect, Pontypridd.—

T. Leugh, Cardiff.....£1,900 0 0  
J. Job Thomas, Cardiff.....1,700 0 0  
D. Davies, Cardiff.....1,630 0 0  
W. Thain, Cardiff.....1,624 0 0  
C. Shephard, Cardiff.....1,585 0 0  
D. J. Davies, Cardiff (accepted).....1,585 0 0

For redecoration, alterations, and additions at No. 12, Fitzroy-square (the new wing) of the parish of St. John, Fitzroy-square), for the Rev. J. J. Coxhead, M.A. Mr. Rowland Plumber, architect.—

Heusman.....£735 0 0  
Watson.....676 0 0  
Turnpin.....617 0 0  
E. Harris.....613 0 0  
Baiton & Heywood.....615 0 0  
M. & M. Fleming, 7, Crown-court, Pall-mall (accepted).....435 0 0

For warehouse, &c., Bunhill-row, City, for Mr. W. Walker. Messrs. Davis & Emanuel, architects. Quantities by Mr. Downing.—

Colls & Sons.....£9,220 0 0  
Williams & Sons.....8,620 0 0  
Grover.....8,228 0 0  
Fritchard.....8,217 0 0  
Nightingale.....8,181 0 0  
McLachlan & Sons.....8,174 0 0  
Ashby, Brothers.....8,166 0 0  
Higgs & Hill.....7,984 0 0  
Sabe & Son.....7,864 0 0  
Ashby & Horner.....7,733 0 0  
Brass.....7,547 0 0  
Boyes.....7,544 0 0  
Lawrence.....7,515 0 0

For the erection of a villa residence on the Warwick road, Coventry, for Mr. Walter Shakeshaft. Mr. H. W. Chataway, architect, Trinity Churchyard, Coventry.—

J. Marriott, Coventry.....£2,500 0 0  
J. V. Wardell, Coventry.....2,238 0 0  
T. Mayo, Coventry.....2,000 0 0  
C. Haywood, junior, Coventry.....1,778 0 0

\* Accepted.

For the erection of a Wesleyan Methodist chapel at Coggeshall, Essex. Mr. S. W. Haughton, architect, East Grinstead. Quantities by the architect.—

H. Goozett, Woodham Water.....£900 0 0  
A. Brown, Braintree.....868 0 0  
J. Beard, Chappel.....810 0 0  
J. Smith, Chipping Hill.....785 0 0  
Gardner & Son, Coggeshall (accepted).....735 0 0

For the construction of hot-water heating apparatus, Joy's Green School, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect to the Board, Mitcheldean, Gloucestershire. Quantities by the architect.—

T. Bradford, London.....£238 12 0  
Geo. Jennings, London.....236 0 0  
Jukes, Coulson, & Co., London.....184 0 0  
C. Smith & Sons, Birmingham.....160 0 0  
W. Truswell, Sheffield.....160 0 0  
J. Fox, London.....156 15 0  
Lea & Son, Runcorn.....152 0 0  
Jenkins, Leamington.....149 0 0  
Perkins & Sons, London.....138 12 0  
Geo. Kneale, Liverpool.....140 0 0  
J. King, Liverpool.....138 12 0  
J. Parkes, Birmingham.....133 18 0  
Waters & Arnold, Newport.....125 10 0  
T. Balmforth, Luton.....125 0 0  
Bacon & Co., London.....121 5 0  
R. R. Gibbs, Liverpool.....114 5 0  
W. Letheren, Cheltenham.....110 15 0  
J. S. Leary, Bristol (accepted).....82 0 0

For the construction of hot-water heating apparatus, Steam Mills School, for the Forest of Dean U.D. School Board. Mr. Alfred Smith, architect to the Board, Mitcheldean, Gloucestershire. Quantities by the architect.—

Geo. Jennings, London.....£234 0 0  
T. Bradford, London.....231 17 0  
Perkins & Son, Regent-square, W.C. ....198 16 0  
J. King, Liverpool.....174 4 0  
Jukes, Coulson, & Co., London.....174 0 0  
Lea & Son, Runcorn.....168 10 0  
C. Smith & Sons, Birmingham.....165 0 0  
W. Truswell, Sheffield.....163 10 0  
J. Fox, Finbury-square, London.....161 15 0  
T. Balmforth, Luton.....160 0 0  
G. Kneale, Liverpool.....150 0 0  
W. Jenkins, Leamington.....149 0 0  
R. R. Gibbs, Liverpool.....146 0 0  
Bacon & Co., Dorset-square, London.....143 5 0  
J. Parkes, Birmingham.....143 18 0  
Waters & Arnold, Newport.....135 0 0  
W. Letheren, Cheltenham.....129 15 0  
J. S. Leary, Bristol (accepted).....118 0 0

For pulling down and rebuilding The Cottage Public House, Fulham, for Mr. T. P. Davis. Mr. W. Bradford, Carlton Chambers, Regent-street, architect. Quantities by Messrs. J. & A. E. Hall, 35, Craven-street, Strand.—

McLachlan & Co. Clapham.....£1,150 0 0  
Adamson & Son, Putney.....1,068 0 0  
Patman & Fotheringham, Theobalds-road.....1,095 0 0  
W. H. Smith, Fulham.....899 8 0  
G. H. & A. Bywaters, King-street, W. ....967 0 0  
Higgs & Hill, South Lambeth\*.....984 0 0

\* Accepted.

For painting, &c., and repairs to roofs, at the Lambeth Workhouse, for Mr. T. W. Aldwinckle, architect. Quantities supplied.—

	Painting.	Roofs.
Smith	£2,779	£125 1
Addict	2,701	10
King & Co.	1,987	65
Martin	1,924	98
Shurman	1,908	10
Carpenter & Pools	1,899	48
Ayres	1,886	20
Read	1,798	30
Fleming	1,710	28
Forley	1,688	40
Collins	1,695	30
Coombe & Son	1,655	23
Shurman	1,594	28
Pukersgill	1,589	25
Calman & Co.	1,538	26
Hulway	1,470	52
Allen	1,368	15
Ford & Sons	1,334	70
F. Pereira	1,196	40
Stewart	1,178	20
Garland & Son	1,170	23
McCarthy	1,163	60
Stevensen	1,143	15
G. Pereira	1,053	45

For alterations, &c., 41, Pembury-road, Hackney. Mr. John Hamilton, architect.—

Warcham.....£238 0 0  
Shurman.....328 0 0  
Harper.....317 0 0

For two houses and shops, Marsh-street, Walthamstow. Mr. S. J. Algar, architect.—

Shurman.....£1,043 0 0  
Wilkinson, Bros.....1,035 0 0  
Good, Bros.....1,000 0 0  
Pocock.....985 0 0

For the erection of a carriage-shed, stables, &c., in Mare-street, Hackney, for the North Metropolitan Tramway Company. Mr. G. Hopkins, engineer.—

Nowell.....£14,970 0 0  
Macey.....13,247 0 0  
Brass.....13,229 0 0  
F. & F. J. Wood.....12,983 0 0  
R. Conder.....12,650 0 0  
Shurman.....12,447 0 0  
Julian & Co.....11,975 0 0  
T. Boyce.....11,503 0 0  
Atherton & Laite.....11,365 0 0  
Holliday & Greenwood.....11,167 0 0

For the erection of a stable for Messrs. Hopkins & Peggs, Shoreditch. Mr. J. Wallace Peggs, architect.—

J. V. Riddle & Sons.....£973 0 0  
Job Smith.....850 0 0  
W. & F. Croaker.....830 0 0  
William Shurman.....783 0 0



For alterations to the White Swan Hotel, Talington-row, Birmingham, for Messrs. A. & J. Henwood. Quantities supplied by the architect, Mr. Bailey, The Bridge, Walsall.

W. & J. Webb	£500 0 0
J. Wilson & Son	519 0 0
T. Elvins	427 0 0
W. Sapote	415 0 0
W. Wistance (accepted)	400 0 0

For the erection of a semi-detached villa residence, Sutton-road, Walsall, for Mr. J. R. Cooper. Mr. F. E. F. Bailey, architect.

W. Wistance	£500 0 0
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For the erection of four shops and residences, and a detached residence and stabling in Park-street and Marsh-street, Walsall, for Mr. H. T. Bell. Quantities supplied by the architect, Mr. F. E. F. Bailey.

Parnell & Sons	£3,977 0 0
S. Surman & Sons	3,990 0 0
W. Wistance	3,913 0 0
Barker & Son	3,793 0 0
A. Lynett	3,755 0 0
John Guest	3,650 0 0
Trow & Sons	3,810 0 0
Thomas Taylor	3,690 0 0
J. Atkins	3,548 0 0
Bradley & Co.	3,543 0 0
James & Sons	3,390 0 0
S. S. Teede	3,219 3 8
G. Widdowson	3,150 0 0
J. Mallin (accepted)	3,100 0 0

For the erection of shops, warehouse, stabling, &c., Nether-ton, for Messrs. W. E. & R. G. Walker. Quantities supplied by the architect, Mr. F. E. F. Bailey.

Mather	£1,265 0 0
Hughes	1,158 0 0
Adkins	1,085 0 0
Holland & Sons	1,068 0 0
Wistance	1,059 0 0
Nelson	1,038 0 0
Willett (accepted)	1,037 0 0

For the erection of a manufactory and residence, Marsh-street, Walsall, for Messrs. Dewberry & Angel. Quantities supplied by the architect, Mr. Bailey.

Chadwick	£941 17 8
Taylor	927 0 0
Wistance	877 0 0
Lynett	865 0 0
Mann	853 0 0
Adkins (accepted)	848 0 0

For the erection of a semi-detached villa residence, Sutton-road, Walsall, for Mr. H. Moseley. Mr. Bailey, architect.

W. Wistance	£782 0 0
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For constructing 9-in. pipe sewer, together with man-holes and lamp-holes, Walldon-road, Worcester, for the Barton-upon-Irwell Sanitary Authority. Quantities supplied by the Engineer, Mr. John Price.

Edmund Bird, Chorlton	£297 18 6
Samuel Cowburn, Hindley	290 0 0
James Oakes, Kearsley (accepted)	136 10 8

For erecting class-rooms adjoining St. John's Schools, Telford-street, Westminster. Mr. H. W. Badd, architect.

Mowlem & Co.	£910 0 0
Hoare & Son	904 0 0
Shaw	890 0 0
Pemberton	870 0 0
King & Son	833 0 0
Lamble (accepted)	794 0 0

For building three shops, Edgware-road, Kilburn, for Mr. R. Ross. Mr. Walter Graves, architect.

Ward & Lambie (accepted)	£2,475 0 0
--------------------------	------------

For alterations and additions to Grange House, Christ Church-road, Streatham, for Mr. T. Bass. Mr. C. Bell, architect. Quantities by Mr. Henry Lovegrove, Budget-row.

Crabb	£3,680 0 0
Bowyer	2,650 0 0
Woodward	2,600 0 0
Higgs	2,367 0 0
Smith (accepted)	2,339 0 0

For completing five houses in Defoe-road, Lower Tooting, for the Fourth City Mutual Building and Investment Society, 6, Queen-street.

Binks	£223 10 0
T. Watson	197 16 0
Gorden	165 10 0

For completing a pair of semi-detached villas at Waltham-stow, for Mr. J. Pousty. Mr. Cable, architect.

Barton & Son	£228 0 0
Sizel	210 0 0
H. T. & H. Holloway (accepted)	174 0 0

For completing six houses at Waltham-stow, for Mr. J. Pousty. Mr. Cable, architect.

Peacock, Brixton	£1,560 0 0
H. T. & H. Holloway, Lavender Hill	1,476 0 0

Accepted.

For alterations at the Atwell Arms, Atwell-road, Peckham, for Messrs. Watney & Co., Stag Brewery, Pimlico. Mr. C. W. Bovis, architect. Quantities by Mr. V. C. Brown.

J. H. Arford	£1,457 0 0
Haradine	1,242 0 0
Smith	1,197 0 0
J. Anley	1,170 0 0
Shereed	1,145 0 0
Spencer & Co. (accepted)	1,127 0 0

For the erection of a villa residence, Bromley, for the Rev. R. T. Verrall. Mr. C. Bell, architect. Quantities by Mr. Henry Lovegrove.

J. & C. Bowyer	£1,645 0 0
Higgs	1,590 0 0
Outwalke	1,427 0 0
Holliday & Greenwood	1,388 0 0
Palmer & Son	1,293 0 0
" " (reduced estimate)	1,150 0 0

For painting and decorating at the Birmingham Town Hall.

Aah & Newbold (accepted)	
--------------------------	--

Accepted contractors for alterations and additions to Providence Schools, Sowerby, near Halifax. Mr. T. L. Fatchett, architect, Halifax.

Mason, Bricklayer, and Ironfounder.

M. Siddall, Sowerby Bridge.

Carpenter's and Joiner's Work.

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J. Stafford, Sowerby Bridge.

Slater and Plasterer.

J. Robinson, Luddenden Foot.

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All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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# The Builder.

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SATURDAY, JUNE 17, 1893

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### On Taste: Philologically and in Brickwork.

It seems to be a question quite worth discussing whence it comes that the special sensibility by which we appreciate degrees of excellence and diversities of excellence in the achievements of art should be under obligation for a metaphorical expression to the sense of taste of all others,—not to one of the nobler senses, as we may fairly call them, to sight or hearing, or even to smell. Our modern languages are all in accord, and employ the same word for the enjoyment of fine art or polite literature as for the commonplace functions of eating and drinking. *Geschmack* in German, *gusto* and *gout* in the

tinction of business-like matters, and could not spare its name, *Sapientia*,—the appreciation of the rapid, literally,—for anything less than the very highest form of intelligence and discretion they cared to cultivate. Otherwise the nearest analogy of their phraseology to the uses of the moderns pertains to the sense of smell, which is most nearly allied to that of taste, is constantly in exercise with it conjointly, and often seems to blend with it indistinguishably. A man of clear nostril,—*emunctus naris*,—might be appealed to for judgment either of wit or of a statue. Doubtless there are notices in abundance to show that Roman society was familiar, not only with collectors of works of art for ostentation, but with the connoisseurs who pique themselves on their knowledge of schools and styles. The slave of Horace, in words that Horace puts into his mouth, complains that he cannot stop to look at a black and red scrawl of a fight of gladiators without being called to account as a dawdler, while as to his master, he can stand before a picture of Pausias as absorbed as if he had lost his wits, and has, forsooth, the repute of a keen and subtle judge of an old master,—

"At ipse  
Subtilis veterum iudex et callidus audis."

Cicero, indeed, can speak of a passion for art as contemptuously as the slave Davus,—or, indeed, more so,—in something like an exaggeration of his very terms. He declares it to be beneath the dignity of a Roman to stand as if he were stupefied before a painting by Ecbion or some statue by Polyctetus: "as in a family those who sweep, wipe, sprinkle, and so forth, are not the superior servants in the establishment; so, in a state, those who give themselves up to excessive interest in things of this kind, are almost in a position of lowest servitude,—servants of fellow-servants."

We shall not easily find enunciations in Greek, at least before the age of Plutarch, that we can set against this; but neither in Greek do we find a parallel to our modern metaphorical employment of taste, nor very easily, as it seems, any expression equivalent to it in meaning. Words expressive of a love and lover of the beautiful offer themselves at once, but not so a name for that discriminative faculty, assuredly as admirably exercised by the Greeks as it must have been constantly put in requisition among them, which, for very sufficient reasons, that it may begin to be thought we are in some danger of forgetting to inquire about, is known in modern times as Taste.

The suggestive analogies are not very far to seek; differences of tastes, positive and metaphorical, are alike exceptionally diversified; likes and dislikes of different people in respect of the arts or of manners are most variable, contradictory, and, at the same time, decided and positive, just as are the likes and dislikes of their palates; and both classes of apprecia-

tion appear to agree in this, that the causes and justifications of enjoyment and repugnance elude demonstration; satisfaction and dissatisfaction in either case appear to depend as much on the idiosyncrasy of the stimulated as on the quality of the stimulant; and no evidence and no arguments are available to prove, even to the indifferent, that sensations of sweetness and sentiments of beauty are produced in those who are conscious of them, by things which are not justly to be called sweet and beautiful. It is a universal experience, indeed, for the individual to be too conscious that he cannot explain to himself the reason of his most decided preferences, either in poetry or vintages, for him to be encouraged to urge them authoritatively on another; but, still we are not driven to admit in all cases that these are as utterly unaccountable in their nature, as Shylock declares to be the series of strange repugnances and antipathies that he enumerates, for which, in his words, "there is no firm reason to be rendered."

To give up an essential distinction between beauty and ugliness in art would be a preliminary to adopting Shylock's theory as to the criteria of right and wrong in morals. Only to this extent, and it is not unimportant, we may assent to him, that in art as in morals, it will often occur that the first warning of a sound decisive judgment is given by simple sympathy. Immediate distaste is often not to be wisely neglected as a hint of dangerous unwholesomeness, nor will a critic wisely neglect a sudden thrill of unexplained gratification before a work of art. Harmonies are recognised by the musical ear, which very unmusical students indeed may be the agents of tracing to a mathematically accurate dependence of vibrations. If the mathematician happens also to have a musical ear, it may be well that his useful scientific investigation may have its direction decided by casual appreciation of an unusual, however slight, enhancement or disturbance of harmony. The more fleeting these delicate yet decisive impressions are, the more desirable is it to arrest them, and, if possible, "pluck out the heart of their mystery." It is in the pursuit of such hints that the students in all the arts gain refinement for their taste and definition for their knowledge. Certainly this is not least the case with the architectural student or connoisseur, who is bound so often to ask himself the question how far he can identify the principle by which a composition produces in him a pleasing sense of harmoniousness; and quite as frequently, it may be, is at a loss to account for a certain sense of discord which mars this harmoniousness, the cause of it being so obscure that it is probably lurking in a detail,—the "fly in the ointment of the apothecary," the midge in the test-tube of the analyst, which makes a serious difference indeed, and vitiates his most laborious process. Nay, it is sometimes only by a deliberate concentration of attention that he becomes definitely aware that



he is not fully pleased, detects himself in slurring over dissatisfaction too carelessly, as if willing to get rid of it. Let us endeavour, after presuming on indulgence in this discursive lucubration, to proceed to show that its discursiveness is by no means irrelevant by inquiring whether some help may not be obtainable to precision in taste by examination of details of architectural treatment that are of all but universal application, and yet not often made the subject of distinct analytical study.

In our previous exposition (p. 571, *ante*) of the arrangements which, in various ways, give distinct expression to central unity in architecture, we omitted, or rather reserved, consideration of the treatment of the angle,—of the extreme termination of a front at its return upon the flank of the structure; but this, or may be made, very importantly contributory to the expressive unity which was in question; and it is here that very frequently there lurks a certain unsuspected liability to mismanagement which damages effect very seriously indeed.

When a composition is not dependent as such upon very predominant central features, the angle finish has an importance only second to that of the cornice; an explicit termination has always a certain natural effectiveness, and when this is emphasised, as, for instance, in the bold roll mouldings of an Egyptian pylon, it completes a decisive border or frame. In modern architecture the favourite resource has been the employment of quoins more or less judiciously designed or disposed; the artifice is too obvious not to have been abused with a facility that invited and even justified the satire of Pope:—

"Then stick four slices of pilaster on't,

Which, laced with bits of rustic, makes a front."

On this topic there is more to be said; but it is necessary to notice first that the first attention is due to the independent responsibility of the angle and to what this seems to imply and demand.

The angle is exceptionally exposed to injurious impact; it lies "in the very force and road of casuality," not like the plain face of the wall protected equally on either side; if there is no visible indication that it is fortified sufficiently or at all to provide against accidents, there will be a weakening of expressiveness which will reduce effect, although the spectator may have no suspicion of the cause of unsatisfactoriness.

Upon the angle, again, is cast an especial structural responsibility; the return of a wall involves in the change of direction a changed arrangement of materials, and an assurance is appropriate, and even required, of accuracy in transition and adjustment. We come here upon what is equivalent to a seam in other kinds of work, or, let us say, to an articulation in the human frame, which it tests the skill of painter or sculptor to express at once with the requisite union of delicacy and force. It would seem that the angle of a building has, structurally, even greater claim to characteristic expression than the keystone of an arch, which soon conduces to stability equally with any lateral voussoir of the same size, and is only indebted for its distinction to the singularity of its position.

Confining ourselves to simple brickwork, in the first instance, what do we find to be the circumstances of the case? These are familiar enough. When the usual Flemish bond is in question, a header is laid precisely over the bisecting line of a stretcher, and, covering as much as half its length, leaves a quarter free at either end to be covered by adjacent stretchers; it is a necessary consequence that, when the end of the wall has to be completed, and we finish one course with a header, the stretcher which has to cover it on the course above will only range flush by being shortened by a quarter. Again, on the return the header will present itself as a stretcher, and if the same system of bond is to be preserved, the header above it will leave a vacancy, which has to be filled by another header shortened to half-breadth.

This diminished brick is, of course, that known as the closer, but is judiciously so far removed to the interior position, the entire header being assigned to the angle where it shows as a stretcher on the return, and so the series recommences.

Now here we are committed to what is in principle a disastrous result; so far as reduction of mean of materials carries an implication of reduction of strength, these interpolated closers tend to give an expression of weakness precisely

at the point where we have a right to desiderate an enhancement and confirmation of coherence and strength. Some may be disposed to inquire doubtfully. But does this arrangement,—granting it to be unfortunate in the abstract,—really tell upon our sensibilities? Does it in any degree effectively disturb complacency, which is otherwise at ease? Would it ever annoy us unless our attention were somewhat officiously drawn to it? The reply is that when it is once pointed out, the annoyance will be readily recognised, and thereafter in a walk through the streets and squares which contain so many admirable examples of brickwork, the dissatisfaction will be found to be not trifling; and if this be so, we may be assured that the cause of it was by no means inoperative in moderating admiration previously, although it was not intelligibly defined and recognised. This is a precise illustration of the cases in which taste is conscious of a check without knowing precisely why,—a check by no means unimportant although so far from rousing repugnance or provoking a distinct protest that it may be much if it even cools enthusiasm so sensibly as to excite to inquiry for a cause. This is one of the contingencies of properly æsthetic taste of which an illustration has been borrowed before from experiences of the wine-tasters. When Sancho Panza's father drank a tall glass from a hoghead of old wine he pronounced it excellent but for a certain faint leathery flavour; his uncle was highly enthusiastic, but with the reservation that he detected a scarcely perceptible but still perceptible smatch of iron. These were altogether phenomenal connoisseurs; one less exceptionally gifted might have shaken his head and declined a second glass, though quite unable to guess what intrusive flavour caused such unusual discrimination until the peccant little key with a leather label was found at the bottom of the tun.

It does not seem extravagant to suggest that when beauty of brickwork and general effect is studiously consulted it would be well that this counter-sense should be avoided, and assistance given to emphasising the angle appropriately by uniting the closer and header by the angle in a single brick manufactured for the place and purpose. Such bricks would be employed in every course, as the angle brick which, showing as stretcher on the front, presents itself as header on the side, and *vice versa*. It is open to us to attempt an alleviation of this difficulty, if not to cancel it entirely, by some other arrangement; we may employ the closer to eke out the shortcoming of a stretcher, but do best to insert the closer between a stretcher at the angle and the interior adjacent header, and thus remove it somewhat further from the corner; but here we incur another inconvenience: all the joints will be covered accurately enough, but it will be observed that the stretchers now only bond one joint instead of two, an advantage which it is not well to forfeit, and an independence seems to be given to headers and stretchers in their vertical pile which is by no means conducive to an expression either of coherence or repose. The same observation applies to an arrangement which is only inserted because it has been seen in good work employed in piers between windows, without any discoverable need or advantage whatever.

Somewhat more promising is the expedient of finishing alternate courses with a closer between two stretchers, the closer will then be equally removed from detrimental proximity to the angle, and the courses will run on throughout with all the advantage of compound bond. This, in fact, is an arrangement which appears to have most in its favour apart from the adoption of the special brick uniting in itself both header and closer, and giving a maximum expression so far of angular solidity.

This device, however, is still insufficient and incompetent to give the full expression of confirmed solidity which the position requires; and, indeed, there is ever the inherent defect in uniform brickwork, that whatever may be the beauty of the workmanship, it fails to give intimation of the thickness of an adequately substantial and solid wall. Still, there are opportunities for the expression of this if duly taken advantage of. It is above all at the angle that these occur, and then in a subordinate degree at the reveals of windows and other openings. In perfectly uniform work there is no hint of the thickness of the wall exceeding the length of a single brick, and this inference tells upon us whether we represent it to our

consciousness definitely or not, even more certainly than Sancho's friends had their liking for the wine affected while still unable to formulate their objection,—to isolate the vitiating smatch with the discriminating palate of his father or his uncle. We confine ourselves now to the resources which brickwork itself supplies, and of these the most important is the employment at the angles of the wall of a brick of different colour and different texture. Before the manner of application is considered, there is even a previous question as to the colours that may be associated. Time will not be ill-spent in perambulating the London streets of the latest Stuart and earlier Hanoverian periods, with eyes to observe, and compare a great variety of such combinations of colour in fronts yet unmodernised by stucco or rebuilding. Such a street as Grosvenor-street exhibits specimens as instructive as any case of minerals or butterflies in a museum. London smoke,—which under William and Mary was already so abundant and deleterious as to drive John Locke in distress out of its reach,—has besmirched the original brightness of many an effective and happy combination; but still they assert themselves as not less than architectural good taste ruined. Their general characteristic is an escape from monotony, whether uniform ruddy,—somewhat over-familiar to us now,—or uniform dun, and avoidance as skilful and scrupulous at the same time of rawness and crudity, of harsh transitions, of picaresque alternations, of screaming contrasts. In fact, for the most part, while the associated colours, and we may say textures too, are sufficiently different to enliven by contrast, they are sufficiently similar to blend.

The employment of a different brick at the angle of the wall is in itself a recognition and a visible enunciation of the fact that the position demands differential treatment, and such treatment, if honest, must regard, must seem to be reminiscent as suggestive of the particular thickness of the construction. The extent to which the difference should spread and be displayed is liable to be affected by the nearness of a window; it would seem to be appropriately such as to represent a consistent thickness of the wall, and something more, but not approach so near to an opening as to risk the impression that all is solid up to its edge. The different brick may be employed with consistent effect, again, at the edges of piers between windows; there is the same reason for strengthened angles and edges where the wall is pierced for an aperture as at the outside angle of the wall; but a discord will infallibly ensue if the differential brickwork at the angle has not assigned to it a decisive predominance over that which borders a window. We may observe that our ancestors of the wigs and knee-buckles, patch and powder days, do not always satisfy us, and evidently had honest difficulty in pleasing themselves with a mode of uniting the differential brickwork of the upright architecture with the relieving arches in the same materials above their windows; the problem is probably not insoluble in several different ways, and may be stated here thus simply, and left to stimulate inventive imagination.

The experiment may sometimes be observed of giving distinct emphasis to the angle of a building by setting the bricks with a projection beyond the plane face and working them into the semblance of quoins alternately longer and shorter. We leave the subject of quoins apart at present, and as regards this mimicry of them, pass it over also at present, with the remark that it can but palpably falsify the responsibility which it ostentatiously undertakes of strengthening bonded construction. The vertical lines of the seeming quoins are apparently coincident with joints, but if so, introduce weakness apparently and gratuitously where it is least of all welcome; the same objection applies to a flat pilaster-like pier carried up without break from ground-line to cornice.

There is one kind of plain wall which meets us too frequently in buildings of even magnificent pretence, and is more unsatisfactory still than that of plain brick, and exaggerates its incongruity of unaccentuated finish, of coming to a stop without reason patent and without anticipation of being stopped. Such are the plain stuccoed walls which do not even carry the lines which are often weakly simulacra of masonry. For anything that appears, such walls might be mighty megalithic slabs perforated for windows; but their usual effect is of fatal feebleness exaggerated by contrast of the



rusticated lower story which they so frequently surmount. Heavy window-dressings are also frequently not spared, and in this case, even, as when they are applied to windows in a plain brick wall, interfere with that sense of balance and proportionate strength which cannot be left uncontradicted if a work of architecture is to have the true effect upon the spectator of a work of art,—to induce him, in the words of Yorick, to “give up the reins of his imagination into the hands of the master,—be pleased he knows not why and cares not wherefore.”

#### THE LIFE OF A HOUSE AND THE LIMIT OF COST IN BUILDING.

For a gorgeous palace to spring from the earth in a night, and, when the object of its production was accomplished, to disappear with equal celerity, was an occurrence by no means considered out of the range of possibility in the East. It is true that the power of the magician, and the ready and potent service of obedient demons, were regarded as the efficient causes of such magical phenomena. But we are told that, as “there is no darkness but ignorance,” so there is no magic but that of wealth. It reads, however, more like a fairy tale than a portion of the daily chronicles of the nineteenth century, that a house on the erection of which, within a very few years past, the sum of 270,000*l.* is said to have been expended, is now to be pulled down and sold for the value of its building materials. From the point of view of the architect, who should always contemplate the combination of utility with any amount of grandeur or of luxuriance of embellishment, such a fact is in the highest degree instructive.

That the duration of a house is to be compared to that of a family, rather than to that of an individual, is a condition that may be said to underlie the very existence of domestic architecture. The tent of the Bedouin, or the cane-built huts of the Japanese, have indeed what may be called less tenacity of life than almost any one of their owners. But the moment that we come to building proper, comprising the work of the mason or of the bricklayer, the idea of the builder is to house, not the individual alone, but the family. And although the most permanent of all human erections are at the same time, so far as we can judge, also those of the greatest antiquity, within historic times the advance of a people in civilisation has been reflected by the increased durability of their structures. Let any one compare the early Celtic churches with the noble ecclesiastical structures of the eleventh, twelfth, thirteenth, and fourteenth centuries, and see how, with the grandeur of conception gained by the architect, his effort to give permanence to his conceptions has become more and more sustained, and more and more successful. If we look to the changes which the present century is bringing over the English landscape, referring not only to the erection of new houses or public buildings, but also to the maintenance or modification of old ones, we shall be struck by the remark that one great force is the main source of the entire transformation. That force is the steady increase of population. It is a spring of revolution, the fulness and power of which we are now only beginning to realise. Its influence is irresistible, and its effect is to be traced by those who intelligently seek for it in almost every department of social life. That the increase of population is the mainspring of the demand for new houses, there is, of course, no room to doubt. As every decade increases the number of the inhabitants of Great Britain by from 11 to 14.9 per cent., a corresponding demand arises for an addition to our existing five millions of houses. In point of fact, between 1871 and 1881, 575,000 houses were added to the 4,260,000 which were inhabited in the former year. With regard to this, again, it should be borne in mind that the urban population now forms exactly 66.6 per cent. of the entire population of England and Wales. Again, of this urban population nearly one half, or 29.7 of the population, are located in towns of 100,000 inhabitants and upwards. We have thus not only large and steady increase, but increase concentrated on a few points. Thus, to speak in round numbers (as being really more instructive than those of minute detail), out of the four and a quarter millions of houses that were inhabited in England and

Wales in April, 1881, 650,000, or nearly 14 per cent. of the entire number, are within the “Greater London” of the Registrar-General’s returns. We then have, if we take the houses to be in the proportion of the population, about 16 per cent. more in towns of the population of 100,000 and upwards; 18 per cent. in towns of 20,000 and upwards; and, again, 18 per cent. in towns of between 3,000 and 20,000 inhabitants. Thus the change is the most rapid where the concentration is already the greatest. Eight thousand six hundred houses are annually added to London. A proportion exceeding one-seventh is added to our twenty principal towns. And even this addition does not keep pace with the contemporaneous increase of the population; so that it is evident that the size of the houses, and their capacity to hold a larger number of inmates, is on the increase. Thus we have 30 per cent. of our increased accommodation confined to London and our large towns, 36.6 per cent. distributed among our smaller towns, and only 33 per cent. over the entire face of the country. Taking the area of “Greater London” at 700 square miles (which is only about 1,500 acres in excess of the truth), nearly one-sixth of the building going on in England is concentrated on one area, comprising only one-eightieth part of the area of the country. It is evident, therefore, that the transforming power exercised by the growth of the metropolitan population must be from twelve to fourteen times as much as that prevalent over the whole area of the country. And if we limit our purview to the 122 miles, out of this larger area of 700 miles, which form “Registration London,” the intensity will be correspondingly increased.

It thus becomes a matter requiring no small judgment on the part of the architect to advise as to the expenditure of any very large sum of money in a locality subject to so great a transforming influence. To build a house that is suitable for to-day may be comparatively easy; but what will be the surrounding conditions ten, twenty, thirty years hence? And thirty years is, or ought to be, but a small portion of the life of a good house.

We can cite a remarkable instance of the force of these considerations in the case of one of our noblest suburban palaces,—discal Chiswick. Chiswick House is, perhaps, less known than ought to be the case. It is a remarkably successful instance of the adaptation of an Italian style of palazzo to the requirements of the English climate. Few suites of reception-rooms, not only in England, but we may say in Europe, can compare with the series of some twenty-one connected apartments that occupy the *piano nobile*, or principal floor, behind and to the west of the great portico and external staircase. The greater part of the villa is on two floors alone, to allow of the lighting of the central series of these rooms from the roof, although at the ends of the building, where windows open all round, two small suites of apartments rise above the level of the skylight. But the wonderful charm,—or rather a wonderful charm,—of this stately palace, is found in the fact that from no window of the house is any building visible, except those dependent on the house itself,—as stables and gardeners’ accommodation. Within forty-five minutes’ drive of the House of Lords, the occupant of Chiswick House looks upon nothing but park and garden. Such an area within a ring-fence is unique, so near the metropolis. It might be thought large enough to laugh at the builder; but, alas! some of the nobler children of the forest are strangely impatient of a city atmosphere. The cedars and pines of Chiswick are, in many instances, giving signs of a sort of creeping paralysis, and we use the words of one of the first of our living botanical authorities when we say that the sickness is incurable. Trees which have been admired by Linnaeus himself are sickening beneath the London smoke-cloud, even when they gird and dot such an unbroken area of turf as the park and drives that surround Chiswick House.

It is, of course, the case that non-deciduous trees suffer far more than do those English forest trees that renew their youth and their foliage every spring. But even the lofty elms of Kensington Gardens and of Hyde Park show little promise of attaining a great vegetable longevity. And if in those areas,—priceless as is their value, augmenting as it does year by year,—where royal or noble ownership has refused to barter nature for silver, and to cut up park into building ground, nature herself

shows signs of retiring from the strife, does it not well become the architect to ponder how, as well as where, he builds for the future, in a locality thus subject to the very hottest blast of natural increment of density of abode?

In the case of Kensington House it is apparent to the most hasty consideration that it was a mistake of irrepairable magnitude to build a house of such a character on so small an area of ground. We are not about to say a word either in admiration or in depreciation of the design or execution of the house itself. The absence of proper garden and park is, in our judgment, ample reason for the non-letting of the building. If we only follow at a modest distance the brand-new splendour of New York, still we have houses in London of palatial grandeur. Nor do we believe that the mere question of cost or of rent, large though it be, would have proved so insoluble as to involve the demolition of a building so splendid, whatever be said of its taste. But those who pay thousands for rent are not content to have the traffic of a busy thoroughfare carried on, night and day, in close proximity to their chambers. A town house has its proper idiosyncrasy,—its advantages and its disadvantages. A palace dropped down alongside of a street, unless it be an Italian street, sinks to the level of its neighbours instead of elevating them to its own. We trust that the failure of this costly experiment will not be without compensation, if it be only to impress on owners, on the profession, and on the public, the fact that one of the first necessities of a fine architectural building is that it should be suited for its purpose and congruous to its site.

In reply, we may anticipate the questions, “How about Genoa?—how about Naples?—and other Italian cities?” where every inch of ground is so covered with buildings, including superb hereditary palaces, as to leave hardly room for a vehicle to pass between them.

The answer is ready to those who contrast the climate and the size of Genoa or of Naples with those of London. The troubled state of Italy during the great building period drove the nobles to rear their abodes within the walls of their native cities, and thus led to the occupation of every available foot of area, and to the further economy of plan obtained by the lofty height of the *palazzi*. But the resemblance between the small area comprised within the walls of a Medieval Italian city, and the 122 miles (not to say the 700 miles) of smoke-producing London, is of the slightest. On the roof or in the uppermost chambers of the great Genoese palaces there is a fair look-out over mountains and sea; and air and sunshine come as freely as they do to the cottagers of an English village. Again, the very proximity of the Genoese palaces to one another, and the narrow width of the *vicoli* between them, secures freedom from that constant roar of traffic which is one of the greatest drawbacks to the comfort of a house built close to a great London thoroughfare. The objections to the adoption of such a mansion as Kensington House for a noble residence are, in the first instance, noise; in the second, “blacks” and want of fresh air. Neither of these troubles afflicts the inhabitants of a Genoese *palazzo*.

At Naples, it is true that the palace is directly bounded, on the north and on the west, by lava-paved streets. But Van Viteelli knew what he was about. An interior corridor, practicable for carriages, on the side of the great Piazza,—a square of garden recessed between the wings of the palace on the north,—so shut out the continual clamour of the streets, that perfect quiet prevails in all the main apartments of the palace. The private suite of rooms intended for the use of the sovereign are at the top of the palace, in the south-eastern corner, opening on a broad terrace,—a sort of hanging garden,—that looks out over the bay, and is as removed from the noise of the town as if at the distance of a mile or more. While as to atmosphere!—no spot in the world is more delicious.

At the Royal Palace at Portici, the main road from Naples to Castellammare runs through an archway in the palace itself. We cannot speak with the same familiarity of the interior arrangements of this palace as with regard to those of Naples or of Caserta, but the size of the building is ample to ensure both privacy and quiet to the occupants. As such, it was offered by King Ferdinand II. for the residence of Pope Pius IX. on his flight from Rome, and was inhabited for some months by the Pontiff. The



portion of the palace to the west of the road looks down through a vista of gardens to the lovely semicircle of the Bay of Naples.

To Naples it is given to unite the convenience and the charm of an urban with those of a rural site. Such cannot be for a moment said to be the case in London. This site and area become dominant conditions for the London architect. And if, by a lavish outlay of money, he complies with the command to rear a palace on an inadequate site, we have before us a striking comment on the unwisdom of the proceeding.

The palace of Fortunatus at Kensington is not the only noted London house which is about to pass into the hands of the dissectors. Two houses in Great Ormond-street have to endure the same hard fate. One very significant fact attends on the demolition of the latter. It is significant in more ways than one. The bricks are so superior to any that can now be purchased that it is probable that their second-hand use will afford finer brickwork than we now can often see. But this speaks well for the old brickmakers (if not so for their cheaper successors), what about the mortar? What would be the value, for facing buildings, of bricks taken from an old piece of Roman work, in this country, or from any structure of *mattoni*, old or new, in Italy? To obtain a whole and unchipped brick from an Italian building would be difficult. In the case of the Thames Tunnel it was found requisite for the safety of the work to build the screen, a wall that divides the two roadways, solid, and to cut out the arches with the cold chisel when the shield had advanced far enough ahead. We well remember, on a visit to the tunnel when in course of execution, being told by Mr. Beamish, the resident engineer, that although a small premium was offered for every brick that was got out whole, it was very rarely obtained. On one or two occasions it seemed that bricks had been hastily set close to the shield without proper cementing, so that they were got out, in a small parcel, uninjured. But these cases were extremely rare, and, as a rule, the cement was as hard as the bricks which it united into one mass.

Is it not a matter demanding the very serious consideration of the architect why it is the case that we can take to pieces a brick building of fifty or a hundred years old brick by brick? If it were set in cement we could not, as we have just seen, think of so doing. If it were Roman work, in spite of the disintegrating action of the work of time for fourteen centuries, we could not do so. If it were brick and mortar of a few years old, built as the Italian architect builds to-day, with lime mortar, we could not do so. The author of a useful little book on "Joints made and used by Builders," to which we recently called attention, remarks, "Being formed by the juxtaposition of every block, brick, timber, slate, or piece of material, however united, joints are well-nigh ubiquitous, and it is easy to see that they form a large part of the workmanship of an edifice, and that, in fact, good workmanship must in all cases be synonymous with good jointing." That, no doubt, is true. But, in a case where any material of the nature of cement is used to form a compact and immovable joint, the question of material is as important as that of workmanship. It is, we suggest, somewhat of an anomaly that we should be content to make such a use of lime for the jointing of brickwork as never to effect perfect cementation, while the very same material, at no increase of expense, but only by reverting to the ancient Roman mode of using it, will so bind together and unite a brick structure as to give it almost the strength and durability of a monolith.

**Workmen's Dwellings.**—The Workmen's Dwellings Committee has adopted its report, and is now about to hold a final meeting. It is said that their report deals in a thorough-going manner with the subject of workmen's dwellings in London, and it proposes the consolidation of the Acts bearing reference to this question, the more stringent enforcement of sanitary laws, and the establishment of cheap workmen's trains, which would admit of artisans living at greater distances from their employment than is possible at present. Sir R. Cross entirely agrees with the other members of the committee as to the comparative inefficiency of his own legislation on this subject, and as to the desirability of strengthening Mr. Torrens's Act.—*Standard.*

#### THE DOMED CHURCHES OF CHARENTE. THE "SHARPE MEMORIAL" VOLUME.

THE book which has been got up by the Architectural Association as a memorial at once of their visit to the churches of the Charente district in 1875, and of the friend who conducted the excursion, has at last been issued after what appears a very long delay to some, at all events, of its subscribers. The volume,\* now that it has appeared, is certainly a beautiful one, both in regard to the illustrations contained in it, and the manner in which it is bound and printed, though it is a pity that it has been allowed to be so long in hand that some of the interest which would unquestionably have been felt about it has unavoidably evaporated.

Mr. Sharpe's name and career are too familiar to all our readers to need recapitulation here. A short memoir prefixed to the volume before us serves as a memorandum in regard to Mr. Sharpe's peculiarly energetic character, and the variety of matters into which he successively or at times simultaneously threw himself, almost always carrying out successfully what he undertook. His most important work is certainly his "Architectural Parallels," in which he brought the illustration of Gothic architecture to the highest perfection, and produced a volume which will always remain among the most complete and thoroughly creditable productions of English illustrative architecture. His other works have been noticed by us from time to time, those especially on the elucidation of Cistercian architecture, in which he took special interest, though some of his views in regard to Cistercian archaeology have been questioned, not without good reason. But Mr. Sharpe's energies were displayed also in lines quite distinct from those of archaeology; he was an excellent administrator of work and workmen, and was, in several cases, railway contractor, railway manager, and then railway owner, and seems to have had the faculty both of carrying through work of this kind, and of making it pay,—an even more valuable quality. The portion of Mr. Sharpe's work which ultimately led to his being commemorated in the book before us was taken up by him in 1870, when he induced a considerable number of members of the Architectural Association to accompany him in a tour among the churches of Lincolnshire, he acting as "guide, philosopher, and friend," throughout. No excursion of the kind could have been more successful; perfect weather, admirable arrangement of everything, and much cordiality on the part of the clergy and others connected with the churches that were visited, combined with the real interest of the architecture visited, and the healthy stimulus of a kind of rivalry in hard work in the way of sketching and measuring, made this a most pleasant and to many of the party a memorable week; but nothing contributed more to the success of the expedition than the pleasant genial manner of its conductor, of whom it was remarked that not only could he give the party (mostly young men) a great deal of information on Gothic architecture gathered in the course of many years' study, but that he had retained the happy faculty of being himself young with the young, and was one of the gayest of the party throughout. It is no wonder that those who accompanied him in various years to different sites of architectural interest felt an affection for his memory, which is testified in a very suitable manner by the publication, by subscription of those interested in it, of this volume illustrating the results of the first excursion of the Association which he conducted out of England, and which, as it unhappily turned out, was to be the last which he was to make. It is pleasantly significant of the feeling with which this memorial volume has been got up, that the names of the members who have practically assisted in making the various drawings are by their own wish left without record, they considering that "they have merely acted for the Architectural Association, and on behalf of the whole profession of architects, and many others, who desired to show that they had felt the influence and regretted the loss of Edmund Sharpe": a feeling which is honourable both to those who have executed the memorial and to him in whose memory it has been done.

It would be difficult to overrate the interest,

\* A Visit to the Domed Churches of Charente, France, by the Architectural Association of London, in the year 1875. Published as a Memorial to Edmund Sharpe. With an Historical and Descriptive Text, illustrated by sixty photo-lithographed plates.

both historical and æsthetic, of the chapter of architecture illustrated in the fifty-nine plates of this book. As to the precise reasons for this peculiar development of quasi-Byzantine architecture in one district of France, there are various opinions, none of which can now be brought to any test of historical truth. The editors have prefaced the volume with some account of the architecture of Charente generally, and of its probable history, which is chiefly a *resumé* of what Mr. Sharpe himself said at the lecture that he gave in London in June, 1876, when he described the excursion and dwelt on the main points of the architecture, before a large audience, which included a good many well-known archaeologists and amateurs as well as members of the architectural profession; and which, by dint of the exertions of members of the Architectural Association in enlarging their sketches for the purpose, was illustrated with a profusion of drawings such as has rarely been seen at an architectural lecture.\* Mr. Sharpe on that occasion commenced by referring to that remarkable event in architecture, the building of the Church of St. Sophia at Constantinople, and then to the reproduction of its leading features at St. Mark's, Venice, connecting this latter with the building of the well-known church at Périgueux; but what especial influence drove the forms of Byzantine architecture in the direction of this particular province of France can hardly now be matter for anything more than conjecture. The interesting fact remains, however, that we have in this district of Charente above 400 churches of the twelfth century, in which the influence of Byzantine design and methods of construction is evident, more especially in the use of the domed roof instead of the cross vault of ordinary Romanesque architecture. This form is the more interesting from its comparatively fugitive character. It seemed to show the possibility of being worked out into a very fine and complete style; but it was belied out of existence by the close of the century, by the superior attractions of the completely vertical style of pointed and vaulted Gothic, which harmonised better with the enthusiastic and aspiring spirit under which Medieval architecture proper was originated and brought to perfection.

Of the west fronts of the churches given in this volume there are two types; those (undoubtedly the earlier) in which the tendency is towards a vertical treatment, the front being divided into strips vertically by long engaged shafts running up a great portion of the whole height of the front, and running through the horizontal bands of ornament or moulding which may cross the front, just as in later Gothic the vaulting shafts run through the triforium string-course; there is the other, in which these large shafts have disappeared, and in which the front shows a large door-arch, with perhaps a smaller ornamental wall-arch on either side of it, and above this one or more tiers of smaller wall-arches running across the front. Most of the west fronts drawn in the volume can be reduced to one or other of these types; the first-mentioned type is, however, only represented by three examples, Angoulême, Roulet, and Lanville. It may seem strange, after we have been speaking of this style of domed architecture being thrust out by the vertical Gothic, to speak of the west fronts with vertical features as the oldest; but the explanation will be obvious to any one who studies the drawings. It is this, that in such a front as that of Angoulême, for instance, the long three-quarter wall-shafts, with high carved capitals showing square abaci, and the remains of a volute at the angles, are not in reality the first beginnings of vertical Gothic features, but rather the last reminiscence of the Roman Classic arcade,—greatly attenuated, it is true, but yet still retaining distinct traces of its Classic character, more especially in the archivolts, with its flat face and soffit and unmoulded aris, and in the high square projecting base on which the shaft stands; and there is something not easily describable in the whole appearance of this architectural feature as seen in the instances named, but pre-eminently in that of Angoulême, which clearly indicates that it has little affinity with the Gothic spirit of building. In the other class of front, as seen, for instance, in La Palud and Bourg Charente, although there is more marked horizontality of division, we find that details and a feeling distinctly Gothic are to be discerned; the archivolts are recessed

\* This address by Mr. Sharpe will be found in *extenso* in our volume for 1876 (xxiv.), p. 632.



in receding planes (the most marked, perhaps, of all distinctions between Gothic and Classic principle in building), and the feeling for repetition and multiplicity of parts which is so characteristic of Medieval architecture begins to show itself. This apparent verticality, which is really anti-Gothic and not Gothic, is one of the most curious points to be noticed in studying these illustrations. This remarkable struggle between Classic and Gothic ideas is shown in another manner in the eastern apse at Plasseac, where, again, there is the arch with the flat soffit in the wall aracting, but the manner in which the longer shaft runs through the caps of the wall-arcade to the cornice is more suggestive of Gothic feeling, as also the way in which the three shafts, this long one and the arcade shaft on either side of it, show symptoms of blending into a "pier." The function of the long shaft in the apse of Plasseac is, however, really that of the buttress, but before it has put on the slightest semblance of the buttress form.

Another point in the architecture of the Charente domed churches which is well brought out in the illustrations, and to which special attention is directed in the text, is the treatment of the pendentives of the domes and the manner in which they are set on the supporting arches. This becomes a curious problem, for in a good many cases the arches which carry the domes are pointed, and, of course, do not lend themselves with precision to the lines of a pendentive circular on plan. The difficulty is not in several cases by the shaping of the voussours of the arches so as to enlarge towards their extrados in such proportion as to meet pretty fairly the curve of the pendentive, which, in some cases, at any rate, is probably also a little doctored to assist in meeting the voussours. This is not by any means scientific construction, it is "fudging," in fact, but it is an interesting example of the practical effort to overcome a difficulty which very likely, in the earlier cases at least, was not recognised till the actual point in the building was arrived at where it made itself felt. At St. Armand de Boixe a curious variation occurs, as here the pendentive curve springs entirely from the extrados of the voussours, which are perfectly flat on their surface; and the pendentive, which appears to be got on to the arches somehow, by rule of thumb, without any apparent adjustment, is carried up three or four courses above the arch, forming a kind of drum growing imperceptibly out of the pendentive. At Roulet and Montbrun are to be seen octagonal cupolas, with a semicircular squinch across the angles, carrying the alternate faces of the cupola.

No praise could well be too high for the grand and massive character of some of the interiors which are shown in admirably drawn perspective views. The fact that some of them are entirely bare of ornamental detail serves only to make them the more suggestive to the architectural student, who may see in them the outlines of grand architectural composition which he could fill up in many different ways in detail, according to the promptings of his fancy. It would not be bad practice for young students to give them one or two of these interiors, with their bare walls and pilasters and plain bell capitals, to add decoration to in a suitable spirit. The caps in some of these are very curious, for they seem literally like the "bell" of a Classic capital with the leaves stripped off.

The external finish of the principal cupolas, which is peculiar to the district, and very considerably resembles a pine-apple, is not one of the most beautiful though it is certainly one of the most curious features which architecture has invented. Its resemblance in general appearance and proportion to some of the towers or turrets prevalent in Hindoo architecture, is curious, though it can only be regarded as purely accidental. The towers at Angoulême, it may be observed, bear, on the other hand, a very strong resemblance to the typical form of Italian campanile with successive stages of window openings increasing in number, though the treatment has more of massiveness and less grace and refinement than were attained in the Italian structures.

The ornamental details given, which are tolerably numerous, are as suggestive as the buildings considered *en masse*. The capitals play all kinds of variations on types of ornament which at one time recall Classic work, at another suggest the future development of Gothic detail. In one of the capitals from

Cellefrouin (plate 13), we see a capital decorated with twisted stalks, from which sprout leaves which are almost precisely like the Greek honeysuckle ornament treated with the freedom of natural growth, and thus given quite a new expression. In the rich impost from Lanville (plate 30), a remarkably broad and fine effect is produced by a mass of foliage, which is really another modification of that apparently immortal Greek ornament, looking as if it had run to seed and sprouted in the wildest luxuriance, as a layer of architectural vegetation covering the whole surface of a series of receding capitals. The most curious animal forms appear, twined about with conventional foliage after the Byzantine manner, or sometimes representing scenes of the chase evidently intended to be as realistic and spirited as the executants could make them. Some of the strangest details are from Cellefrouin, in which all sorts of styles appear to be ending and beginning. The Classic cantilever, with a characteristic treatment, appears side by side with Byzantine leaf-carving and with an inchoate form of the dogtooth ornament; and an intersecting arcade (plate 45) offers the most singular combination of light coupled shafts completely Gothic in feeling (though with a capital such as we have seen nowhere else), with a heavy intersecting arcade of arches with flat faces and soffits, and not a particle of ornament of any kind to lighten them. Two or three of the carved doorways of many orders resemble the richest Norman work; but with forms and combinations peculiar to themselves. Altogether the book is of the highest interest, and we are only disposed to regret that its circulation is restricted to the subscribers, and that it is not open to public purchase. We hope that copies will be bought for the leading libraries; it is certainly a book which ought to be made as accessible as possible to architectural students.

#### THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS.

The annual meeting of this society was held in the hall of the Society of Arts, Mr. J. Bryce, M.P., in the chair.

Mr. William Morris (one of the hon. secretaries) read the annual report, which recorded that the committee had had to protest against several schemes for what they deemed to be the mere unnecessary or wanton destruction of ancient buildings. The society was extending its operations to many of the ancient cities on the Continent, and they were endeavouring to spread a desire for the protection of that which was ancient and beautiful.

The chairman, in moving the adoption of the report, said the society had no desire to preserve anything not worthy of preservation; they wished to prevent the repairing and restoration of old buildings in such a style of reproduction as to represent a lie. The society at its annual meetings generally laboured under the difficulty of having an educated and refined audience, whose sympathies were generally in accord with the society's object. He thought it would be a good thing if they could get some of the local architects and some of the old churchwardens, whose chief ambition was to see how they could utilise some of the old materials of ancient buildings in carrying out what they considered would be good local improvements. He contended that ancient buildings and monuments belonged to the nation, and that no local or private authority ought to have the right to destroy them. He hoped that the proposed Bill of Mr. Lefevre would embody this principle. He was in favour of having local societies in connexion with the central committee spread throughout the country.

Mr. C. Kegan Paul seconded the motion, which was carried. The following resolutions were also agreed to, the first on the motion of Lord Richard Grosvenor:—

"That in the opinion of this meeting efforts should be made to impress upon the guardians or owners of our ancient buildings that it is their duty and obligation to cause to be done to them all such repairs as will suffice to preserve them from falling into ruin or decay."

"That in the opinion of this meeting the attempt to reproduce the features of a bygone style in the reparation of ancient buildings is impossible to be successful, and must of necessity seriously injure such buildings as have to undergo the operation both as regards their artistic and historical interest."

#### "CLASSIC ARCHITECTURE."

THIS is the volume by Messrs. Roger Smith and J. Slater, which forms one number of the Illustrated Art Handbook series,\* and concerning which we made a slight complaint before, that the two books were published in their wrong order, and that the Classic architecture volume, forming, as it must do, the necessary preface to Gothic architecture, ought to have been produced first. However, the volume on Classic architecture is better late than never.

In the introduction, architecture is described as "building at its best," which is too vague for a definition, but not a bad characterisation. The author (we must speak of the authorship in the singular number for convenience) suggests the division of all architecture into four broadly-marked groups,—the trabecated columnar, the round arched (whether columnar or not), the pointed-arched, and the imitative architecture of the Renaissance and succeeding period, which latter is marked also "by that luxury, complexity, and ostentation which, with other qualities, are well comprehended under the epithet modern." This method of classifying modern architecture is, we should suggest, a good deal too simple for the complexity of the subject; but as the present volume is not really concerned with Renaissance architecture, but only with the true Classic styles, the point may be passed over here. A further classification is made in regard to the elements of building, which are divided into (1) floor or plan, (2) walls, (3) roof, (4) openings, (5) columns, (6) ornaments, and (7) distinctive character. This is a very unsatisfactory and loosely-expressed classification. "Columns" should have been "piers," or "supports," which is obviously what is really meant, and is the only sense in which this part of the classification can be accepted as generally applicable. "Distinctive character" is too vague an attribute to be classed as a separate quality; it is, in fact, so far as it can be defined at all, in a great measure inherent in the differences and peculiarities of the other portions already classed. The author proceeds rightly to point out that the method of covering openings exercises a most important effect on the style of a building, but the confusion of expression between "pier," and "column," which is continued throughout the book, is one that should not occur in a small text-book. We should also question the assertion that the Greek temples were designed chiefly for external effect, and to please those who examined them from without. The Greek architecture was less purely internal than the Egyptian, certainly, but it must be remembered that we can judge better of the exterior aspect than of the interior from the ruined remnants of the temples, and for ourselves we should hesitate very much to assert that Greek architecture was not in fact and in intention as effective and complete internally as externally, when in its normal state of decoration and lighting.

The leading features of the main styles treated are well illustrated, however, both in description and in numerous engravings, three or four of which we are enabled to reproduce as specimens of the style in which the small volume is illustrated. The author includes Hindoo architecture in his subject, which we are therefore to suppose that he regards as an allied branch of Classic architecture; and though no explanation is offered on this head, the small bit of quasi-Greek ornament from Allahabad (wonderfully Greek, considering its locality) may be taken as a kind of practical justification of this classification of Hindoo architecture. This chapter is preceded by that on Egypt and Assyria (due regard being had to the hints of Greek style foreshadowed in Assyrian detail, capitals, &c.), and followed by that on Greek architecture, which is, of course, one of the most interesting points of the book. How a writer on this subject treats Greek architecture may almost be regarded as a test of the fitness of a book to form a guide and text-book to Classic architecture. This portion of the work is, in the main, eminently satisfactory. There are only two points to which we should be disposed to take a little exception; one is the statement that the alteration of the heights of members of the architecture in order to allow for the effect of perspective was "demonstrated" by Mr. Pennethorne in his

\* Architecture, Classic and Early Christian. By T. Roger Smith, Professor of Architecture, University College, London, and John Slater, B.A., F.R.I.B.A. London: Sampson Low & Co. 1882.



work on the "Geometry and Optics of Ancient Architecture"; our opinion, as previously expressed, is that the author of that book failed to "demonstrate" simply because he tried to prove too much. That the Greeks should have altered the dimensions of the upper members of their architecture in order to allow for the perspective diminution of them as they receded from the eye is exceedingly reasonable and exceedingly probable; but Mr. Pennethorne claimed to have proved the connexion of this practice with an adherence to minute and pedantic observations of proportions such as would have been quite ineffective and unmeasurable by the eye in practice, and the apparent proofs of which would only be obtained by the assumption of ideas in regard to the method of the Greek architects for which there was no substantial proof forthcoming, and which involved, without meaning any disrespect to the author of a very elaborate and deeply-considered book, the presupposition of some of what we can only call absurdities. There is nothing in Mr. Penrose's book on the optical refinements of the Parthenon of which this can be said, and, therefore, we object to see the two things classed together. The other point which we should put a note of interrogation to is the rather too positive assumption of the constructive wooden origin of certain parts of the Parthenon details (triglyphs, mutules, guttæ), without any reference to the extraordinary art by which these details, even if they were purely wooden in their origin, were refined by the Greek architects into apparently masonic features. The triglyph is no doubt remotely connected with timber architecture; whether the mutules and guttæ so seems to us more doubtful, and the connexion, at all events, is very distant. This part of the subject should have been given with more qualification. The fact of the mutules being at a different slope from that of the roof even at the sides, and being carried round the ends where there is no pretence for this suggestion, is conclusive at least that all ideas of reference to timber construction had evaporated before the details got into the shape in which we know them.

The general description of the Greek styles is, however, as complete and satisfactory as could well be in so small a compass, and is what we may call profusely illustrated for a book of this size and price. In regard to Greek ornament, there is, indeed, fuller and better illustration given than we have often seen in much larger works, and the author keeps before the mind of his reader the fact that the Greek temples were tolerably profusely ornamented, by giving all the drawings of the temples and parts of them, when at all large enough, with indications of ornament in the portions where no doubt it did exist as painted decoration. On a small-scale engraving, it is true, this gives a false impression to the eye, because the ornament in that case shows by comparison a much greater relative prominence than it would have shown in reality; but this method, nevertheless, helps to keep before the reader's eye and memory the fact that the Parthenon was not an undecorated mass of white marble. Attention is called to one very beautiful point in regard to the relation of ornament to its position in Greek work, and one which, as the author truly says, is seldom pointed out, viz., that the outline of the ornament applied to a moulding to enrich it is generally similar to, sometimes identical with, the outline formed by the profile of the moulding itself,—a fact highly characteristic of that sense of logical relationship of parts in which the Greek architectural designers were so pre-eminent. In speaking of Roman ornament, the coarseness of which both in regard to decorative ornament and mouldings, when compared with Greek work, is duly pointed out, the author misses, however, what we believe to be the real relation between much of Roman ornament and its Greek originals, namely, that the Romans carved in relief, and thus brought into overdone prominence and importance, ornament which the Greeks only painted on the surface. Hence the comparatively over-rich and "pie-crust" character of some of the more sumptuous Roman examples.

Roman architecture is, however, very fully treated and illustrated in the space allotted to it, and the progress through the Roman basilica architecture to the Romanesque which forms the link between Classic and Gothic architecture is sufficiently exemplified. We give one of the illustrations of the basilica interior, that

of St. Paul without the Walls,\* which forms one of the best examples of those buildings in which the Classic forms of architecture began to put on the Christian spirit which was destined to work itself out eventually into the complete form of the Mediaeval church. The outline perspective view of St. Sermin\* at Toulouse forms a fine and characteristic example of the period when the reminiscence of Classic forms was still strongly manifested in a type of building which, nevertheless, had begun to exhibit that greater elaboration and multiplicity of design which is one of the main distinctions of Mediaeval as compared with Classic building. The progress of detail from the Roman to the Mediaeval spirit is well exemplified in the doorway from the Romanesque church at Koesfeld,\* which forms the third of the illustrations we have selected, where the peculiarly Mediaeval feature of the receding planes of the arch mouldings is seen combined with details which still display a distinct reference to Classic types. In the Byzantine capital from San Michele at Ravenna\* the Gothic spirit in detail has become nearly predominant, the ornament of the centre portion of the capital, though undoubtedly derived originally from Roman scroll ornament, has here lost almost all trace of its Classic origin; but the trace of this is still distinctly seen in the marginal ornament, which has an obvious and unmistakable reference to the Greek honeysuckle ornament, though treated with a freedom and irregularity quite at variance with the traditions of Classic art. These illustrations serve to indicate with how much judgment the examples have been selected as typical of the prominent historical changes which architecture in this transition period was passing through. Below the bell of the capital, in the last illustration, the bands which form the necking may fairly be regarded as a rough and rather coarse survival of the delicate and refined annulet ornament of the Doric column.

We may congratulate Professor Smith and his coadjutor on the production of a volume which forms a very useful popular guide-book to the portion of architectural history of which it treats.

#### THE MOSCOW EXHIBITION.

THE exhibition which was recently opened in the old capital of Russia is unanimously reported to be a success far beyond the expectations of its promoters. It is really the first general exhibition of industry and art in Russia. The opening-day sufficed to show the enthusiasm with which the population regarded the enterprise. The inaugural ceremony attracted many thousands of spectators, and was in every way worthy of the occasion. The Grand Duke Vladimir appeared as representative of the Czar at the opening, and was accompanied by Prince Eugene, of Leuchtenberg. On their way to the exhibition building these princes were enthusiastically cheered by the multitude who lined the streets, as well as by the crowds assembled near the Kremlin, in the exhibition, and afterwards at the theatre in the evening. The enthusiasm was repeated on the following day along the whole route, several miles in length from the Kremlin to the exhibition grounds. On the opening day the Grand Duke Vladimir, who appeared in the new Russian National uniform, was present not only at the religious service conducted by the Metropolitan Makarius, but at the concert at which Rubenstein's new "Russian Symphony," comprising all the local popular airs of Russia, was performed in honour of the occasion. The exhibition, of which the Grand Duke subsequently took a first inspection, is purely one of Russian products and manufactures. It is described as one of extraordinary extent and variety. The number of visitors has been very large every day since it opened.

**Darlaston, Staffordshire.**—Mr. Edward Pritchard, C.E., of London and Birmingham, has been called in professionally by the local board to advise them as to the best method of dealing with the sewage of their town, to prevent the Birmingham Corporation taking their threatened proceedings under the Rivers Pollution Act, in consequence of the river Tame being polluted by their sewage flowing into that river.

#### THE TOWN BUILDINGS OF THE FUTURE.

THE chief preliminary observation in conversation of Englishmen is usually considered to be an inquiry or remark as to the state of the weather, but an almost equally common topic of conversation at the present day may be said to be the increasing size of our large cities. This increase, indeed, is a fact which has already had wide social and political influences, and the subject in this aspect is one of deep interest to all who bestow any thought upon the social and political condition of the country. It is hardly less interesting, however, to consider some of the probable effects of the present size of our towns, and of their certain increase in the future, upon the character of our buildings, and changes in the style and nature of the structures of our cities must necessarily have an influence on the social and domestic habits and character of those who live in them.

The main tendency of the future in consequence of the enlarged area of our towns must necessarily be not only an attempt to make the outskirts as accessible as possible to the centres, but also to prevent the further enlargement of towns and the consequent lengthening of distances. It is clear that towns will go on increasing in area without much check for a comparatively long period, but a time must arrive when the desire of the inhabitants is, if possible, not to go further but to utilise so much of the space as is already built over more than is done at present. The increase in area must necessarily continue; but, on the other hand, a contrary influence strengthens and increases. At such time towns begin largely to increase in height, and it is in an increase in the height of our town houses that the increase of the future is sure to be most marked. Our only surprise is that altitude of buildings has not become a more distinctive feature of the age before this than it has done. But, as it is, signs are not wanting that a tendency in this direction is growing up, and we have very little doubt that from year to year it will become more marked, and will become a characteristic feature of the buildings of a not very distant age; for there can be no question that what may be termed a general heightening of buildings would enable a larger number of persons to dwell nearer the centre of our larger cities than they can do in houses of the present height; and also the more persons get familiarised with this change in the aspect of buildings the more it will become a familiar and accepted result of the increasing population of our towns. Of course, an immediate result of the heightening of buildings would be to make dwelling in flats an ordinary feature of our social existence. So far flats are not an ordinary feature of English towns as they are of Edinburgh and the large Continental cities. This, perhaps, not wholly surprising, when we bear in mind the very high rents which it is customary to charge for flats in London; whereas there can be no question that a flat should be a cheaper habitation than a single house. The ground-rent should be proportionately less; there are possibilities for economy both in heating and lighting, and the cost of building a flat should also be proportionately less than that of erecting an ordinary house, and there must be many feasible improvements to be made, such as automatic lifts and so forth. Therefore we are inclined to think it may reasonably be supposed that, as it becomes more common to dwell in higher houses, so the rent of flats will, for a time at any rate, become more moderate and more within the power of persons of small means. With electricity, also, only in its infancy, we can feel no doubt that this element will play an important part in connexion with the higher houses of the future. Moreover, high houses seem to have many sanitary advantages, for the cost of elaborate and effective ventilation, and of careful sanitary arrangements, must clearly be less when spread over a number of dwellings within one dwelling-house than when charged on one comparatively small dwelling-house alone, and also individual apathy will have less influence than it has at present. For whilst now an apathetic householder can permit the sanitary state of his home to be as bad as he likes, there are in a community of persons certain to be some energetic and careful people who will take care that

\* See p. 745.



the health of the community is not endangered by the apathy of one or two persons. Because, be it observed, it is much more apathy than active hostility to sanitary improvements which, as a whole, is the bar to a more rapid improvement in the general sanitary state of our towns. Again, the congregating of persons in a single dwelling-place must necessarily be an incentive to all kinds of co-operation, and, consequently, must help to modify the consequences of the expense of living in our large towns. It is true that clubs of the upper and middle classes, although in the nature of co-operative institutions, and although consisting of persons dwelling in one large house, are by no means economical establishments. On the other hand, luxury is one of the pervading characteristics of our modern clubs (and a characteristic, by the way, by no means without evil effects), and there is not a small attempt made at economy; and, therefore, clubs do not seem to have much bearing on the question of residential flats in large high houses.

But it is by no means among the middle classes that high houses may be expected to become general; they are equally certain to be found among the working classes, and there they can hardly fail to be decided improvements over the present dwellings of the poor. The Improved Industrial Dwellings Company has, indeed, taken the lead in this direction, and in various parts of London and our larger cities the passer-by may from time to time come across some dwellings of this character. In that the sanitary arrangements can hardly fail to be better, and the houses, from being more carefully built than the ordinary workman's cottages, should, in themselves, be more healthful. Co-operation, again, of a certain character may also be carried on, and we see no reason why in common reading-rooms or halls a very potent enemy of the public-house may not have a prosperous career. Indeed, we consider high houses in flats, with one or two common rooms attached, and a proper playground or play-room for the children, to be dwellings which every one interested in the social and moral improvement of the working-classes should energetically strive to see largely erected.

That large dwellings, both among the middle and lower classes, may have many distinct effects on the general habits of the community is equally obvious; but without discussing these at present, it may be said that there seems no reason why domestic life should become less really private, although at certain times there may be facilities for a larger amount of social intercourse in one house.

From the architect's point of view, too, there are several other aspects from which the question of high houses must be regarded. There is, first of all, the important question of the effects in regard to the Law of Light which must become even more important than it now is if once the tendency to erect high houses grows and strengthens; and it is not improbable that the greatest blow against the existing law and the most likely cause of its abolition will be found in its antagonism to the general sentiment in favour of the erection of dwellings of a considerable altitude. Then, too, if the building of this kind of structures became common, many questions in relation to the width of our streets must necessarily arise; for, without doubt, squares and gardens, rather than streets, are the most fitting shapes in which large buildings of this character should be placed. What a fine space, for example, would Belgrave-square be for a number of big houses! It may be thought, perhaps, that our imagination in respect of the future form of our city dwellings is too vivid, but no one can take notice of the rapidity with which offices and other business premises take their way skywards without feeling that the same tendency must shortly become more marked in regard to the domestic dwellings, not only of the middle-classes, but also of the artisan. No doubt there are other aspects in which they may be regarded in addition to those which we have noted above, and there are many details in relation to them which will well bear discussion; but we have rather sought to take note of the, at present, not very marked social current, and of some of its broadest effects, than to go elaborately into details. For in social matters as in politics, it is the broad underlying currents which should be carefully noted, since the details, which are parts of them, are apt to be regarded as isolated facts, and then the true drift of things is not properly perceived.

#### THE COST OF THE INCANDESCENT ELECTRIC LIGHT.

Those who witnessed the splendid display of arc and incandescent lights shown at the late Electrical Exhibition at the Crystal Palace, and examined the capabilities of the two systems, must have speedily come to the conclusion that, as far as domestic lighting goes, the incandescent light is, as far as it can be seen at present, the light of the future. As yet we have no trustworthy data as to the relative cost of the incandescent light and gas; we have hitherto had nothing but guesswork, and all we know with any certainty is that for the same amount of light the incandescent system is very much dearer than the arc system, about whose cost there is still so much difference of opinion.

Such being the case, a letter which recently appeared in the *Times* from Mr. W. Crookes, F.R.S., so well known to even the unscientific world by his discoveries in chemical and physical science, will be read by practical men with interest, seeing that it gives us a glimpse of what is likely to be the cost of lighting three reception-rooms in a spacious, well-appointed house upon the system under consideration. The glimpse afforded by Mr. Crookes's figures does not amount to very much, but in our present state of ignorance we must be thankful for small mercies. When Mr. Crookes's avowedly approximate estimates are eliminated, and only the indisputable data are accepted, we learn that the relative cost of lighting the same rooms for a year by electricity bred from a gas-engine and a dynamo-machine in the basement, and by gas passing through a meter is 38*l.* 7*s.* and 43*l.* 4*s.* 6*d.* respectively, showing a saving of 4*l.* 17*s.* 6*d.* in favour of electricity.

Mr. Crookes tells us that for the last six months he has had the principal reception-rooms in his house in Kensington Park-gardens lighted by the incandescent light, the electricity being generated by a 34-horse power Otto gas engine, which drives a small Bürgin dynamo machine, giving sufficient electricity to maintain twenty-two 30-candle lamps, or their equivalent, at their full power. There are more lamps than this in Mr. Crookes's house; for instance, he has a cluster of twenty-one 4-candle lamps in his drawing-room and several 20-candle lamps elsewhere, but he tells us that his dynamo is not able to keep them all alight at one time; indeed, the occasions when a private gentleman's drawing-room, dining-room, and library are simultaneously lighted up are rare. The above calculations, it must be understood, are made entirely on the basis of twenty-two 20-candle lamps being maintained at their full power.

The engine seems to require no other trouble than to fill the lubricating oil-cups and start and stop it daily. In the calculation given above 2*s.* 6*d.* per week is included for the wages of the engineer who cleans it periodically.

Mr. Crookes notes that the expense of installation, including engine, dynamo-machine, wires, and lamps, has not exceeded 300*l.*, but in his estimate Mr. Crookes makes no mention of the interest on this sum or of the percentage to be allowed for wear and tear. Now, 5 per cent. interest on the primary outlay, and the same amount for deterioration, the latter a somewhat low estimate, would add 30*l.* per annum on to the cost of the light, making a total of 68*l.* 7*s.* per annum instead of 38*l.* 7*s.* Then, again, Mr. Crookes, who shows the most philosophical candour in his estimates, tells us he had to excavate and build underground rooms for the machinery, besides having to devise and carry out special appliances for carrying off the products of combustion, and to construct silencing chambers to prevent smell and noise reaching his neighbours' noses and ears. It is a pity that Mr. Crookes did not give us these figures, for the expense would be similar in other cases, at least in towns, where every householder who thinks of following Mr. Crookes's example would have to take the same precautions for his own sake as well as his neighbours'. Of course, in the country, where there is plenty of room, this item of expense would disappear, or, at any rate, be greatly reduced.

Taking the case of a country house, therefore, where room is abundant, and some out-house could be used for the engine and dynamo-machine, the total cost for lighting any two or three large reception-rooms is, including interest and wear and tear, 68*l.* 7*s.*, as against 43*l.* 4*s.* 6*d.* for gas; or, in other words, slightly more than half as much again as for gas. To

counterbalance this increased expense, we must take into our calculations the manifold virtues of the incandescent light as compared with gas. We have no sooty ceilings; painted decorative work does not blacken and flake off with the smoke and heat; bookbindings are not rotted by sulphurous fumes; gilding is not tarnished; we are not suffocated by the heat, carbonic acid, and half-burnt gas; the air of the room remains cool, fresh, and uninvited; and fire risk is almost annihilated.

In counting up the cost of gas, Mr. Crookes has not taken into consideration the interest on the outlay for bringing the gas from the main, pipes, brackets, and chandeliers, wear and tear, &c.; but as we have again no data, we must leave these items out of our calculations.

Again, we have said nothing about the cheapness of the electric light as compared with candles, wax or paraffin, or mineral and vegetable oils, wishing to confine ourselves entirely to gas.

For the present, thanks to Mr. Crookes, we are one step nearer to a true estimate of the comparative cost of gas and the incandescent light as applied to the illumination of private dwellings,—but only one step.

#### MUNKACSY'S "CHRIST BEFORE PILATE."

THOUGH the importance of this picture has been much overrated, as is generally the case in England with what are regarded as religious pictures, it claims a word of special notice as a powerful and somewhat novel treatment of the subject. The novelty partly consists in what many persons in this country will seem the most questionable feature in the painting, the elimination of all specially divine appearance or attribute in the principal figure, who appears simply as a thin, worn, and thoughtful devotee, silent and pre-occupied amid the tumult, and with not much even of ordinary human dignity in his manner. Munkacsy seems to have aimed at realising in his Christ the type of a gentlemanly enthusiast, taken up with alife and with aims quite apart from that of those among whom he is placed. The countenance, however, is not by any means as much at variance with the most generally accepted type of head of the Saviour as has been represented; it is the type of rather long high-browed face, with long hair and beard, which has been so prevalent almost from the earliest periods of painting as to suggest the idea that there must have been some kind of traditional foundation for it in truth; but it is this type of face without the aureole and without the look of superhuman nature with which painters of the orthodox school have endowed it. To many this ideal of Christ, for reasons we need not go into here, will appear more strongly suggestive than the usual painter's ideal.

The grouping of the picture is very effective. except that the two white robes, those of Christ and Pilate, in the centre and at the right of the picture, a little clash with one another, and make a rival claim on the eye. Pilate is seated on a raised seat, with a niche and pedestal over it, in what would seem to be intended as a building erected in Jerusalem by the Romans for their own official purposes, for the details are entirely those of Roman architecture. We may add that the architectural portion is rather poorly conceived and drawn. Several of the Jewish rabbis are around the seat of the governor, one in a speech with strong action denouncing the prisoner, another looking round into Pilate's face to see how he is affected by the address, two or three others sit on either side of the governor, as if holding a partly official position in the court. How far this is in accordance with historic probability we will not undertake to say. The remainder of the canvas is occupied by the crowd who have surged into the judgment-hall in the wake of the rabbis, and whom a soldier endeavours to keep back at the top of his low-looking fellow is shouting at the top of his voice, in a manner which seems improbable in the actual presence of the governor. This figure is evidently designed as a most marked contrast to that of Christ; but the contrast is overdrawn, from an artistic point of view. The figure is too repulsive to be an agreeable element in a picture. One woman in the background looks on with an expression of sympathy and respect for the figure who is the centre of all the tumult. The most successful of all the



figures in point of conception is that of Pilate, which represents admirably the grave, business-like Roman official, the only quiet and unmoved figure, except that of Christ, towards whom he points with a slight gesture of the hand, as if accompanying the words, "Answerest thou nothing?" but with the expression of a man totally outside the real interest of the scene, and merely desirous to arrive at a comprehension of the rights of the case.

The painter has certainly added something to our conception of the great scene he has portrayed, and done something to increase its vividness and reality, and make it live better in our imagination, which is the highest object of historical painting. No one who has seen the picture will read the narrative afterwards without feeling that he has gained something towards realising it in his mind's eye. It is to be wished, we may add, that the picture had been placed in a frame better designed and more in keeping with the subject than the rather vulgar mass of gilt *rococo* which surrounds it.

#### GATHERINGS FROM ABROAD.

It is probably only in Paris that such a scene could be witnessed as that presented by the *Salon* a few Sundays ago (not Whit-Sunday) when over 40,000 visitors passed *gratis* through the turnstiles of the Palais de l'Industrie. Even putting aside the very striking deduction to be drawn from the number of the persons who thus evinced their interest in the exhibition, we see how the Parisian public shows its appreciation of the privileges granted it in the matter of free Sunday amusement and instruction. The comparative desolation of Burlington House even on Whit-Monday last stands as a curious contrast to the scene that is presented by the Palais de l'Industrie every Sunday during May and June, and yet the Parisians have open on the same day all their public museums and great institutions, which will also all be found to be crowded. A few further figures relating to the Paris *Salon* may interest—3,556 artists exhibit, of whom 708 are ladies (440 painters, 96 sculptors), and 697 are strangers, among whom let us not forget to mention a young Englishman, Mr. William Stott, who has deservedly gained a third-class medal. M. Puvion de Chavannes has been awarded, as we predicted, the grand *medaille d'honneur*, and in the section of architecture, as already announced in these pages, M. Paulin has gained the medal of honour for his beautiful archaeological drawings to which reference has before been made in these columns.

On the close of the *Salon*, the Union Centrale, it may be mentioned, will open in August next at the Palais de l'Industrie their seventh modern and retrospective exhibition of decorative art, a show specially to be devoted to furniture, tissues, and books,—three important industries in which France holds, and has long held, a high position in the markets of the world. What house, indeed, does not contain some specimen of French work in each or all of these branches of decorative art, unless, indeed, it be a house (one in Paris) which, we learn from the *Débats*, is the smallest in the capital? Certainly, it would be difficult to imagine a dwelling of more miniature proportion than that one in the Rue du Château d'Eau, one story high, with a façade one yard broad and a depth of three yards! The brick trade in France, notwithstanding the large use of stone for building purposes, is in a decidedly improving condition. In addition to the home consumption the yearly exportation from Marseilles is on the increase. In 1878 we learn that the export consisted of something over 5,250,000 of bricks, and hard on 12,000,000 tiles (roof tiles), and some 12,500,000 of *carreaux de terre*, or floor tiles. In 1881 the returns show over 12,000,000 of bricks, 22,250,000 of roof tiles, and 17,500,000 of floor tiles. Marseilles is the chief port; the trade returns show that nearly half of the whole exportation passes through that city. Compared with the trade of other countries the French brick and tile trade cannot be said to be very important, but an advance of over 60,000l.—180,000l. worth of bricks was exported last year as against 120,000l. worth some years since,—marks an improvement in the trade.

English Egyptologists will be pleased to hear that a statue, by M. Jacquemart, to the late Mariette Bey is shortly (July 16) to be unveiled in his native town of Boulogne-sur-Mer. The

French Government will be represented, as also the learned societies of Paris and London. Boulogne will be for some days *en fête*.

Dr. Schliemann, a no less active archaeologist than the late lamented Mariette, is, we learn from the *Allgemeine Zeitung*, hard at work at his excavations in the Troad, as also in the Thracian Chersonesus. At the request of the German antiquaries, he has re-examined the excavated portions of his work without, however, obtaining any important results. The Doctor candidly admits to having until now entertained several erroneous views as to his discoveries. Troy of Homer, which he stated he had laid bare, he now finds to have been very unimportant. The blocks of stone which he had hitherto considered to be the remains of walls of the third city are found to be the remains of houses belonging to the second, destroyed by a fire even more terrible than that which swept over the third city. The Doctor will continue his excavations till August. In the meantime he has sent home a number of sketches of the objects he has so far discovered.

Greece, as the land of archaeology, will always retain the romance that is woven round its past. Only a few days since, M. Renan, receiving among "the immortal forty" of the French Academy, M. Cherbuliez, the well-known novelist,—in speaking of the new comer's visit to Greece (as the result of which he published his "*Cheval de Phidias*") referred in touching words to the extraordinary place held by Athens, as "the one place in the world,—there is no second,—in which perfect beauty had been realised"; its monuments "the relics of a world of miracles of divine development which will never be removed. All the rest was of a piece. A whole people admired this art in the Acropolis. This same people heard the perfection of eloquence in the mouth of a Demosthenes; it applauded a dramatic literature which seems made for a group alone of cultivated students; it conversed in a language of elegance and simplicity,—that used by Plato and his friends." And referring to the new Academician's work "*Un Cheval de Phidias*," in which he "expressed his sentiments on the most profound transformation which has been worked in humanity," he said "as you pointed out, the passage from Paganism to Christianity was, before all, an æsthetic revolution."

A word will not be out of place respecting the Place de la République in Paris, where immense preparations are being made for the approaching fête of the "Quatorze Juillet." The decoration of the huge piazza is advancing rapidly; not so, however, the statue of the Republic. The base is as yet unfinished, and a year will probably elapse before the whole group, with its accompanying decorations, will be completed.

At the Hôtel de Ville great preparations are being made for the July fête, when the new building will, it appears, be solemnly inaugurated in spite of its being, as we have already stated in these columns, far from complete. The exterior is, however, entirely finished. It may be mentioned that the façade is a reproduction of Boccador's original plan, with an additional height and breadth of some eight yards. The total length is 144 metres (472 ft.). We may mention as apposite the recent publication of a work by M. Marius Vachon on the old Hôtel de Ville ("L'Ancien Hôtel de Ville de Paris, 1533—1871"), a sad picture of the terrible destruction of the famous building. The work is profusely illustrated with reproductions of the pictures, sculptures, and other decorations of the original edifice; views at different periods of the Hôtel de Ville,—one by Jacques Cellier of 1583, another by Israel Silvestre of the commencement of the seventeenth century; the whole accompanied by copious letter-press.

Not far from the Hôtel de Ville the Commission of Historic Monuments is restoring the interesting tower of "Jean sans Peur," the sole remaining and rare specimen in Paris of the military architecture of the fifteenth century. To those interested, it may be mentioned that the donjon tower,—in excellent condition in every respect, excepting the roof,—is situated at but a very short distance from the Halles Centrales in the Rue aux Urs. It originally formed a portion of the town residence of the powerful Dukes of Burgundy.

Paris is not rich in such picturesque relics of the past; it is not like Nürnberg, where, at the present moment, the National Bavarian Exhibition is drawing its crowds of visitors to

the home of Dürer, of Peter Vischer, of Hans Sachs, of Veit Stoss, Adam Kraft, and how many other artists and honest artisans! Bavaria stands out well in the Exhibition, to remain open till the autumn, and no pleasanter or more instructive excursion could be recommended for the "outing" this year than a trip to the quaint old city and its surrounding country, so peculiarly interesting to the architectural student.

Southwards, in Spain, Seville, home of the school of art which produced Zurbarán, Herrera, Velasquez, Alonzo Cano, and Murillo, is only commencing to settle down to the hum-drum of every-day life after the fêtes which have marked the commemoration of the bi-centenary of the death of Murillo, and long will the memory of the processions to the Giralda be recalled, the wreaths placed at the foot of the great picture of the painter, the St. Anthony, and the ovation to the statue in the plaza before the museum, and the triumphal car in which the famous "Conception" was represented as being raised from its easel to heaven by the fair hands of angels.

The "Commission Rubens" has just published at Antwerp its first "Bulletin Rubens." The commission was formed after the great fêtes which celebrated the birth of the painter, with a view to collecting all documents relating to Rubens. Every three months a bulletin will be published containing contributions from various sources, but strictly confined to actual facts, not critical views, connected with the life and works of the popular artist, whose magnificent existence was passed in so many countries.

To admirers of early Italian art it may be interesting to know that two curious frescoes attributed, and with every justification, to Botticelli have just been exhibited to the public at the Louvre, which, with the Brera Museum and the small collection at Perugia, monopolises in Europe the speciality of works of art in that most fragile, yet durable, of materials, fresco. The works in question were discovered by accident in the Villa Lemmi, half way on the delightful road from Florence to Fiesole, and historical evidence goes far to show that the pictures really are the work of Botticelli. To those interested, we recommend the charming autotype reproduction published, with accompanying text, in the *Gazette des Beaux-Arts* for May last.

The *Zeitschrift für Bildende Kunst* informs us that a commission, composed of a large number of professional experts, among them the new Royal Gold Medalist Baron von Ferstel, of Vienna, Herr Schmidt, also of Vienna, together with other architects from Munich, Berlin, Cologne, Stuttgart, and elsewhere, met not long since at Ulm with a view to determine on the completion of the cathedral. The principal tower is to be terminated, while internally the work of restoration is rapidly proceeding; the sculptures of the principal portal are also at the present moment undergoing complete restoration. Ulm Cathedral, now a Protestant place of worship, is justly considered to rank among the six most famous Gothic minsters of Germany. The superfluous covered by the building is far superior to the Cathedral of Strasburg and St. Stephen's at Vienna, being only inferior to those of Spire and Cologne.

#### THE INLAND TRANSPORT OF BUILDING MATERIALS.

ALTHOUGH the subject of canal transport lies almost without the range of the matters germane to the *Builder*, it is impossible to deny that the question of the rate of carriage of building materials is one that practically comes home to us almost daily. The choice of material, in fact, where cost is a primary object, mainly depends on the price of transport. Why do we see brick buildings cover the face of Middlesex, and stone buildings rise in the villages of Derbyshire? There is no doubt that in the latter the native stone supplies a material that is at once better and cheaper than is often the case with brickwork. But a sharp limit to the area of the employment of stone was originally drawn by the cost of horse transport. When it was a question of carrying on the backs of asses or mules every hundredweight of material, it was cheaper to carry coal or wood to a clay country, and then to burn bricks, than it was to carry stone. Thus the limits of stone and of brick, or even of wooden and plaster structures, were originally fixed by the cost of transport, first on



the backs of asses or mules, and then by cart or wagon. With the invention of canals, the range of the mason became extended. The legislation of last century respected the wants of the builder, as well as those of the farmer. In the first Act of Parliament for the construction of the Bridgewater Canal (dated in 1762), the toll of 1d. per ton per mile was authorised on all commodities of any description. But in the Act of Parliament for the Aberdeen Canal, one of the earliest of these undertakings (which received the royal assent in 1793), while it was permitted to charge 5d. per ton per mile "for all iron, timber, goods, wares, merchandise, &c.," "building stone, tiles, lime, and sand," as well as manure, were to be rated at 1½d. per ton. Throughout the Canal Acts of Parliament in general the like distinctions are maintained; and there is no doubt that the architecture of many parts of the country has been greatly benefited in consequence.

Of that very serious inquiry which is now before the notice of the committee of the House of Commons as to railway rates, we have only to refer to those questions that directly affect the builder. They are quite grave enough of themselves to demand investigation. On the 6th current a meeting of the newly organised "Railway and Canal Traders' Association" was held at the Cannon-street Hotel, Mr. James Howard, M.P. for Bedford, in the chair. The difficulty experienced by traders connected with the supply of building materials in dealing with the railway companies was prominently brought before the meeting. One of the speakers represented nine of the chief brickmaking, tilemaking, and terra-cotta making firms in both England and Scotland. He spoke very feelingly of the impossibility of making proper trade arrangements while the charges are as capriciously made by the companies as is now the case. Another speaker complained that building timber was carried from Liverpool to Lynn in Norfolk for a less price than to inland towns at half the distance. The whole outcome of the evidence laid before the Select Committee on Railways may be thus summed up. A strife is now being waged between the railway companies and the traders. The demand of the latter is that the former should be restricted to the powers, and held to the responsibilities, of carriers. The argument of one gentleman who addressed the meeting was, that by a thorough adoption of this policy, including the publication of vouched debtor and creditor accounts for each branch of their trade separately, the companies would largely increase their dividends. The arguments put forward on the part of the companies, on the other hand, point to nothing short of rendering their managers absolute masters of the trade of the country,—favouring those localities, or even those firms, in which they take an interest, at the expense of the community at large. The Report of the House of Commons Committee on the subject is expected to be signed about the 16th inst. Meantime, we call the attention of all architects and builders who are interested in the cheap and fair transport of building materials to the fact of the establishment of the Railway and Canal Traders' Association, the secretary of which dates his circulars from No. 9, Mincing-lane, E.C.

#### ON A RECENT DECISION AS TO THE ADVANCE OF MONEY TO BUILDERS.

WHETHER builders borrow more than most other business men in order to carry out their contracts, may be a question not without interest, having regard to the effect which such a mode of obtaining funds for the completion of a contract may have on the way in which the work is done. No one, however, doubts that builders do carry on their operations very largely by means of funds borrowed on the security of partly-constructed buildings, or on that of sums payable in respect of the work on which they are engaged. We can, therefore, scarcely pass by without a brief notice the case of *Lewis v. Hoare*, 44 *Law Times Reports*, p. 66; 29 *Weekly Reporter*, p. 357, which was decided last year by the House of Lords. Indeed, seeing the high tribunal to which this case was carried, we should have noticed it earlier had it been reported in the *Law* or the *Law Journal Reports*. It is quite true that the decision turned on the construction of a particular document, and

therefore involves no great legal principle, and is, doubtless, quite rightly omitted from the leading reports; still this does not prevent it any the more from being a case of considerable importance to the readers of this journal.

The facts of the case were by no means complicated; for it appeared that a builder named Thick agreed to erect six houses for a Mr. Lewis. There was in the agreement, as in most of these contracts, a proviso that the last instalment was to be paid within three days after the surveyor should have certified in writing that all the works had been fully completed to his satisfaction. Before the work was completed, Thick was in want of funds, and accordingly borrowed from one Hoare the sum of 110*l.*, and gave an authority in the usual form to his employer to pay the sum to Hoare on the completion of the contract. In addition to this document, Hoare obtained from Lewis a guarantee of the same date that in consideration of the advance, and of the above authority, he promised to pay the 110*l.* "on the completion of six houses in accordance with a contract dated the 28th of April, 1876, between myself and Mr. Thick." In process of time the houses were completed, but no certificate was ever given by Griffith according to the terms of the contract, as we may charitably hope, because the buildings were not completed to his satisfaction. Be that as it may, Mr. Lewis refused to pay the lender the sum which he advanced, on the ground that by the terms of the memorandum the money was not repayable unless this certificate had been given, because this was the meaning of the term in the memorandum which we have already set out. Now, of course, as we have said, no legal principle can be evolved out of this matter, but it shows that if a house-owner guarantees the repayment of money, and desires to make it repayable only on the completion of the building to the satisfaction of the architect or surveyor, he must say so distinctly, and in so many words. As the agreement was drawn up, it was, said the Lord Chancellor, "a definite promise to pay a sum certain on the completion of six houses in accordance with the contract entered into by the builder." And, again, Lord Blackburn says:—"He [the house-owner] does not make a promise to pay on the money due for the work becoming payable to Thick, or upon Griffith certifying that the houses were complete, but what he does stipulate for is payment on the completion of the houses in accordance with the contract." We confess that at first sight it might fairly be argued that the intention of the parties was that the whole contract was incorporated in the so-called guarantee; on the other hand, it must be remembered that at the trial the jury, after hearing evidence, found that the houses were completed before the action began. Into the rights or wrongs of the question of completion it would be useless for us to enter, the practical point which may usefully be learned from the case is the necessity for a house-owner who desires to guard himself against re-paying an advance for houses which the architect or surveyor would not pass, to make this a distinct condition of the promise or guarantee. To us it seems not only a very reasonable condition, but one which ought to form part of such promises; because a builder working on borrowed money may presumably be considered more likely to scamp his work than one with plenty of cash at his banker's, and because, in any case, it will be an additional incentive to the work being properly executed. It may be that advances would not be in such cases so easily obtained, but presuming that a surveyor would only withhold a certificate if he could honestly and properly do so, such a reluctance to advance money would be to the advantage of honest and thorough builders, and would act only to the detriment of those who do not execute their work in a proper and satisfactory manner.

#### Sanitary Institute of Great Britain.—

In connexion with the Congress of this Institute at Newcastle-upon-Tyne, in September next, the following gentlemen have accepted the Presidency of the various sections:—Mr. Dennis Embleton, M.D., F.R.C.P., Section I. (Sanitary Science and Preventive Medicine); Mr. Henry Law, M. Inst. C.E., Section II. (Engineering and Sanitary Construction); Mr. Arthur Mitchell, M.A., M.D., F.R.S., L.L.D., Section III. (Meteorology and Geology).

#### ENGLISH AND GERMAN ROOFING SLATE.

LAST week the German Parliament rejected the proposal to place a heavy increase on the existing import duties on slates for roofing and other purposes, the majority against the proposal being very considerable. The matter is of some interest in England, as the proposed protective duties were aimed almost entirely at the imports of English slates. With the rejection of the proposed change, however, the hopes of not a few speculators connected with German slate quarries have been dashed to the ground. In the expectation, or rather full confidence, that the German Legislature would henceforth by protective duties exclude English slates from the German market, these acute promoters had drawn up schemes for the creation of a number of large German slate-quarrying companies. The existing slate-quarries in Germany were to have been sold at what was alleged to be an "alarming sacrifice" to the new concerns, although at the same time it was represented in other quarters that the purchase-money would really make the fortunes of the vendors. The projectors had laid their plans deeply. Petitions had been presented to the Imperial Parliament from the workmen in all the quarries, complaining of the miserable condition in which they were kept by English competition, and praying that the House would assent to the proposed protective duties. The promoters had further put themselves in communication with Prince Bismarck and other political personages, as well as with a number of wealthy capitalists, and everything was perfectly prepared for the realisation of their great financial schemes. In spite of the fact that the unsoundness of these speculations had been exposed by the *Cologne Gazette* and other papers, there is no doubt that the projected companies would have been floated, with consequences which it is only too easy to predict.

That this speculative business and the proposed prohibitive duties would have been of no benefit to Germany, and that if the scheme had succeeded, and the protective customs duties had been accepted instead of rejected by the Reichsrath last week, Germany would have had to pay very dearly for its whistle,—are facts only too clear to those who are acquainted with the comparative qualities of English and German slate. A German architect, in writing upon this subject, admits that, much as he desires the prosperity of his own country in general, and of the German slate-quarries in particular, it would be a piece of ridiculous folly to deny the great superiority of the English slates, or to prohibit their continued import into Germany. The writer in question says that that country for Germany, the slate quarries of that country are unable to produce anything to compete with English slates. The German material has natural defects which cannot be removed, disqualifying it for purposes for which the English slates are admirably fitted. Even in the very provinces where the German slate quarries are found, the German slates are beaten by the English. And this is not only on account of the greatly inferior quality of the native product, but also on account of its being actually dearer than the English. The quantities of roofing slate imported into Germany from France and Switzerland are quite inconsiderable compared with the imports from England. The reason of this is, firstly, that the French and Swiss slates, like the German, are inferior in quality to the English; and, secondly, that they have not the advantage enjoyed by the English of a cheap means of carriage by water. In fact, in North Germany, French slate is only employed for certain purposes, and that on account of its varied tints. It is, however, not unfrequently palmed off as English slate upon inexperienced purchasers in Germany. Moreover, the principal market for French and Swiss slate is Western and Southern Germany,—that is, those parts of the empire which are nearest to France and Switzerland, and, what is still more remarkable, the only parts of the empire where slate quarries are found. Though inferior to the English, the French and Swiss slates are superior to the German. German slate is, from its geological character, a material that is never of uniform homogeneous quality. It invariably splits in a coarse and irregular fashion. Hence it can only be used in thick and heavy tablets or slabs. Comparing the quantity of German slate required to roof a given area with the amount of English slate requisite for the same extent of



roof, we find the advantage is nearly in the proportion of three to one in favour of the English. The writer, to whom we have above referred, states that 50 lb. weight of English slates will cover 11 square feet of roof, while the weight of the German slates required for the same area is no less than 130 lb. This enormous difference in the weight of a German and English roof tells in favour of the English in more ways than one. First of all, there is three times the weight of material to be carried from the quarries to the spot where it is used. In great distances, therefore, the cost of carriage is much against the German. Secondly, the supports of the heavy German roofs, must, of course, be much stronger, and, therefore, more costly than the English. Besides this, the German slates themselves are so rough and irregular, and of such small size, that the preparation of the roof is much more costly in their case than in that of the English, where the laths can be wider apart. And after all, notwithstanding the greater expense, the German roof is rarely watertight. But even this does not represent all the disadvantages of the German slates. It is found in practice that roofs with German slates must be steeper than with English slates. Thus, to every 10 square feet of ground surface there must be 14 square feet of roof surface with German slates, whereas only 12 square feet of roof is necessary with English slates. This alone represents an additional advantage of 151 per cent. in favour of the English material. Finally, there is another disadvantage of the German slate. Whenever a roof requires to be repaired, it is necessary for the workman to avoid stepping on the German slates. He must always rest on a ladder placed upon them; while upon a good roof of English slates he can move with tolerable freedom. Altogether, therefore, it is not wonderful that the German Parliament should have refused a protective duty intended to drive English slates entirely out of the German markets; but the rejection of the higher duty would not have been secured unless the whole of the German master builders had been up and doing. When they found what they were threatened with, they besired themselves *en masse*. A monster petition, with the names of all the master builders and roofers in forty-four of the largest towns of Northern Germany was presented just in time to the Imperial Parliament, protesting against the prohibitive duty, exposing the misstatements of the German slate-quarry owners, and stating that English slates were absolutely indispensable. Numerous other petitions came from other parts of the empire to the same effect. One represented seventeen towns in Saxony; another, the merchants of Berlin; another, Saxon roofers; and so on. In short, it is seldom that the German building trades have been so agitated as within the past few weeks on this question of a protective duty on imported slates. The protest they raised was, however, so loud, unanimous, and strong that the Protectionists were defeated, and the Imperial Parliament refused the proposed increase in the tariff by a large majority.

#### THE NORTHERN COAL TRADE.

It was stated recently that the price of coal in the London market is now lower than it has been for many years; and yet concurrently with that low price there is a production of coal that is larger in total than has been previously known in this country. In the great coalfield of the North there is an unexampled production, and in that district there are specially interesting phases of the trade. The stimulus was given by the very great demand for crude iron for the United States, and it has been since contributed to by the activity in the shipbuilding industry, and in the iron trade in consequence of that activity. It is believed that there is at the present time a production of five million tons of coke in the South Durham coalfield,—chiefly for use in the smelting of iron. The export of coal is the highest that has been known, and the shipments to other home ports are also very large; whilst, finally, the general consumption locally has advanced with the revival of trade, and with the fuller circulation of money. But the production has increased fully as rapidly, and even more rapidly, than that of the demand, and hence prices are weak, and the profits of the coalowner are problematical. The supply is capable of being further increased, because in the era of a fierce demand some seven or eight

years ago there were very great steps taken to enlarge the capacity of production, and these have now become available for drawing upon wherever needed. But as they are taken up there is a tendency towards increase of prices, and it may be that in the winter this will show itself. A low demand for coal is natural in summer, but it is certain that at the present time that known in the North is above that of the corresponding period in recent years, and it is fair to conclude that with the winter there will be an increase over the demand of last winter, when the consumption was sufficient to cause once or twice small increases in the price.

At the present time the coal trade of the North of England is supported in very great degree by the demand for manufacturing purposes, and that shows no signs of abatement, whilst the consumption for locomotives, for the gas manufacture, and for the supply of the mercantile navy, is growing yearly, so that it is fair to anticipate that there is a prospect of a continuous increase in the demand; and there is to be noticed a better use of the coal than there has been in the past. In the smelting of iron there are many changes being introduced, such as the use of larger heating-stoves, to raise the air to a higher temperature before it enters the blast-furnace, and thus to lessen the consumption of fuel. But whilst there is more economy known in the use of the coal, there is abundant room for much more, and especially in the large quantity that is consumed in our merchant navy,—only a comparatively small part of the power that is represented by the fuel being extracted and used when thus employed, whilst the waste of coal in domestic use is general throughout the whole of the country. There is a constant increase in the consumption of coal in progress, and it is kept in check only in its rate by the economy that is introduced. That better use of coal needs to be increased and introduced into other branches of the consumption, and were it, as fully as it ought to be, there would be a continuation of cheap fuel and a prolongation of the duration of our coal-fields.

#### ST. JOHN'S CHURCH, DRESDEN.

THE newly-formed community of St. John of Dresden had realised by the sale of property a sum of 150,000 thalers (22,500*l.*), and owned, besides, a not very eligible site; but a satisfactory church had to be erected on it, and an architect was needed to solve the difficult problem. A young architect of Zwickau, Möckel by name, a disciple of Hase, of Hanover, came, viewed the site, considered the sum at disposal and what was expected to be done with it, and thought he could meet the requirements of the case. If it should be asked how he met it, it is sufficient to cite the opinion of men eminent in their profession, who say unanimously that Möckel has erected the most original modern church in Germany. The architect sent in his plan unsolicited, and, notwithstanding that he was an entirely unknown man, it found general favour at once with the church authorities; but in justice to the profession it was deemed necessary that a competition should be held. Two eminent architects were invited to prepare designs, and all three were submitted to a committee of well-known German architects. The judges unanimously selected that of Möckel. Oberbaurath von Schmidt, of Vienna, one of the committee, suggested several changes; but at the close of his report is found a remark which formed the best testimonial for the young architect. He says,—“Even should Möckel decline to accept any of the changes suggested by me, his church will be a well-considered, spirited, and beautiful work of art, to which I cannot refrain from giving my full approval.”

The edifice was begun in 1875, and completed in 1878. It is pleasing externally, suited to its purpose, and imposing by sober earnestness in its interior. The ornamentation seems to grow out of the supporting masses; it does not appear added to it, as is seen only too frequently: it is an organic part of the building, and represents a natural growth of the structural elements, charming in its details. The tower, with its imposing vaulted hall, projects into the street, and thus nothing is lost of its full effect. It rises in pleasing proportions to belfries. Möckel has made use in the spire of an artifice common amongst Greek architects. They gave to the middle of their columns, as is

well known, a soft outward swelling, probably to counteract a curious optical delusion, which frequently causes vertical lines to appear inclined inwards. The swelling, which is also applied in the spire of Freiburg Cathedral, heightens the statal feeling considerably, guards the spire from an over-pointed, meagre appearance, and gives it more force. The surfaces are animated; the numerous windows are well disposed; the perspectives are picturesque; and the whole is enlivened by the warm tone of the material used, Pirna sandstone.

A few words regarding the architect. Gotthilf Ludwig Möckel was born in 1838 at Zwickau, Saxony. His father was a coppersmith, and died early, without leaving property behind him. The son had soon to rely upon his own exertions, and, under great disadvantages, to push his way in the world in order to attain the object of his wishes,—that of following the profession of an architect. Möckel belongs to that class who are in the main self-educated, who have early to gain a livelihood, and it may be that from this circumstance arose the sharply pronounced individuality of his works. He is independent in every respect, an enthusiast in his views of architecture, and ever ready to defend them. He is now a busy man, and he numbers amongst his patrons princes, public bodies, and private persons alike. But it cannot be said that he has as yet had an opportunity of fully displaying his powers and originality. He has still to accomplish his *chef-d'œuvre*.

#### CANTERBURY CATHEDRAL: VIEW IN CRYPT.

THE crypt or undercroft at Canterbury is reached by a descent from the Martyrdom, and is, as most of our readers know, one of the most interesting parts of the church. It is of greater extent and more lofty than any other in England. The extreme internal length is 230 ft. from the western to the eastern end, and its breadth at the transept is 130 ft. The crypt is cruciform in plan, and the principal part, 83 ft. 6 in. from wall to wall, is divided into a nave and aisles by lines of short massive pillars supporting low arches, upon the same plan and forming a support to the choir above. From the western extremity to the distance of 150 ft. eastward is the oldest part of the crypt, and its erection is ascribed to Archbishop Lanfranc. The illustration shows the eastern or later portion of the crypt, pointed arches being used, and the pillars varying in some degree from those more westward.

#### PRESTON-NEXT-FAVERSHAM UNITED DISTRICT BOARD SCHOOLS.

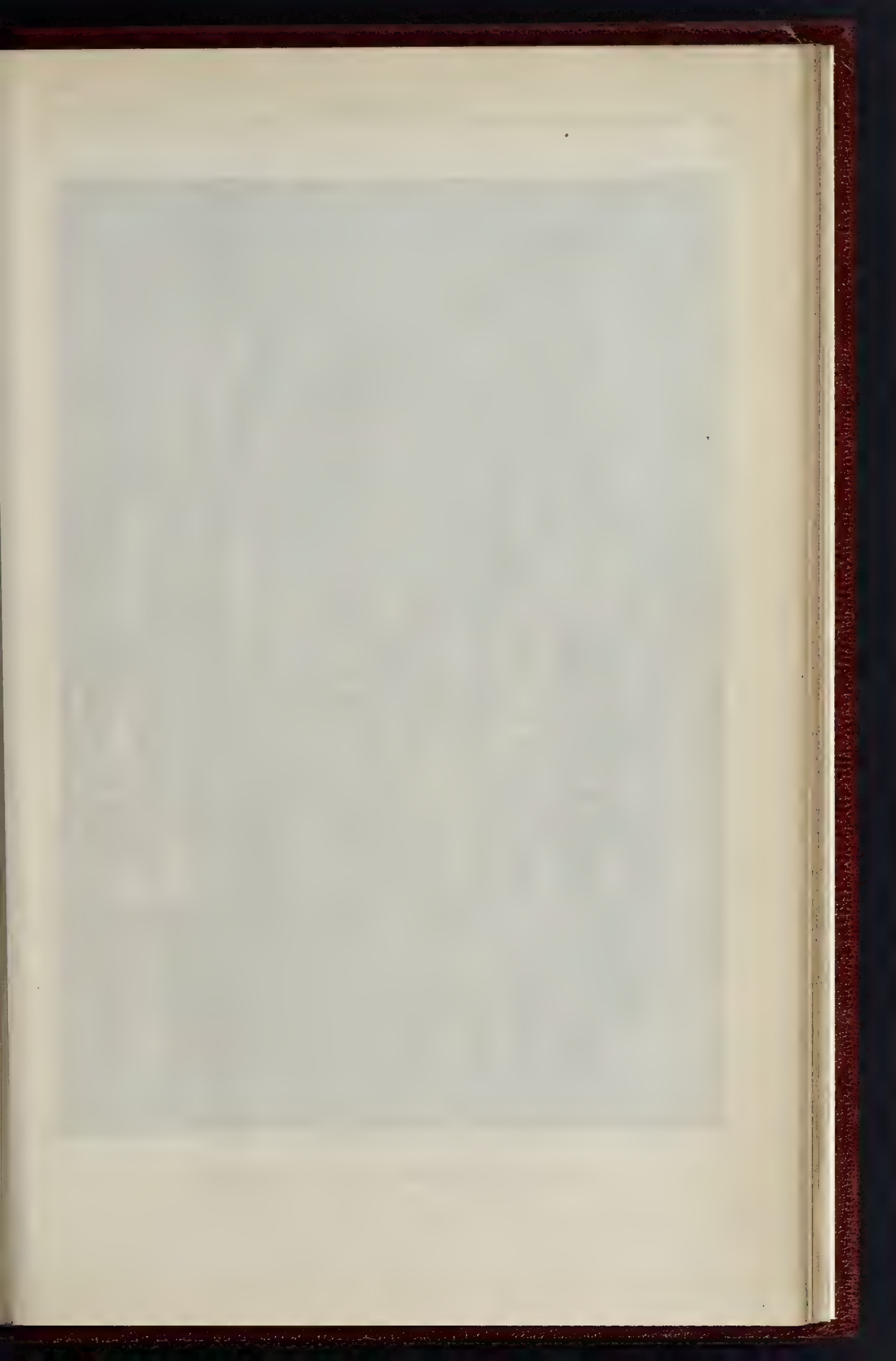
THESE new schools, which are now just on the point of completion, have been erected to provide school accommodation for the joint parishes of Preston-next-Faversham, Davington, and Oare, whose population has during the last few years largely increased in consequence of the extensive development of the brick trade in the immediate neighbourhood. The accommodation provides for 500 children, and comprises separate schoolrooms for boys, girls, and infants, with suitable rooms in each case; basket and hat rooms, with arrangements for drying the wet clothing of children; lavatories, and two residences, the whole being planned with due regard to convenience in their use, and to the proper supervision by the master.

The material is grey stock bricks from the locality, relieved with red moulded brickwork. The roofs are covered with pressed tiles, in plain and ornamental courses, from the Aylesford Pottery Company, near Maidstone; and the works throughout have been designed with regard to economy consistent with sound and durable building.

Messrs. Whiting, builders, of Ospringe, near Faversham, are the contractors, and have carried out the works in a satisfactory manner under the directions of Mr. Benj. Adkins, of Faversham, the architect to the School Board.

The Trustees of the Avenue Parade Chapel, Accrington, have just accepted tenders for pulling down the chapel, and rebuilding the same from the designs, and under the inspection, of Messrs. Maxwell, Tuke, & Hurst, architects, Southport.

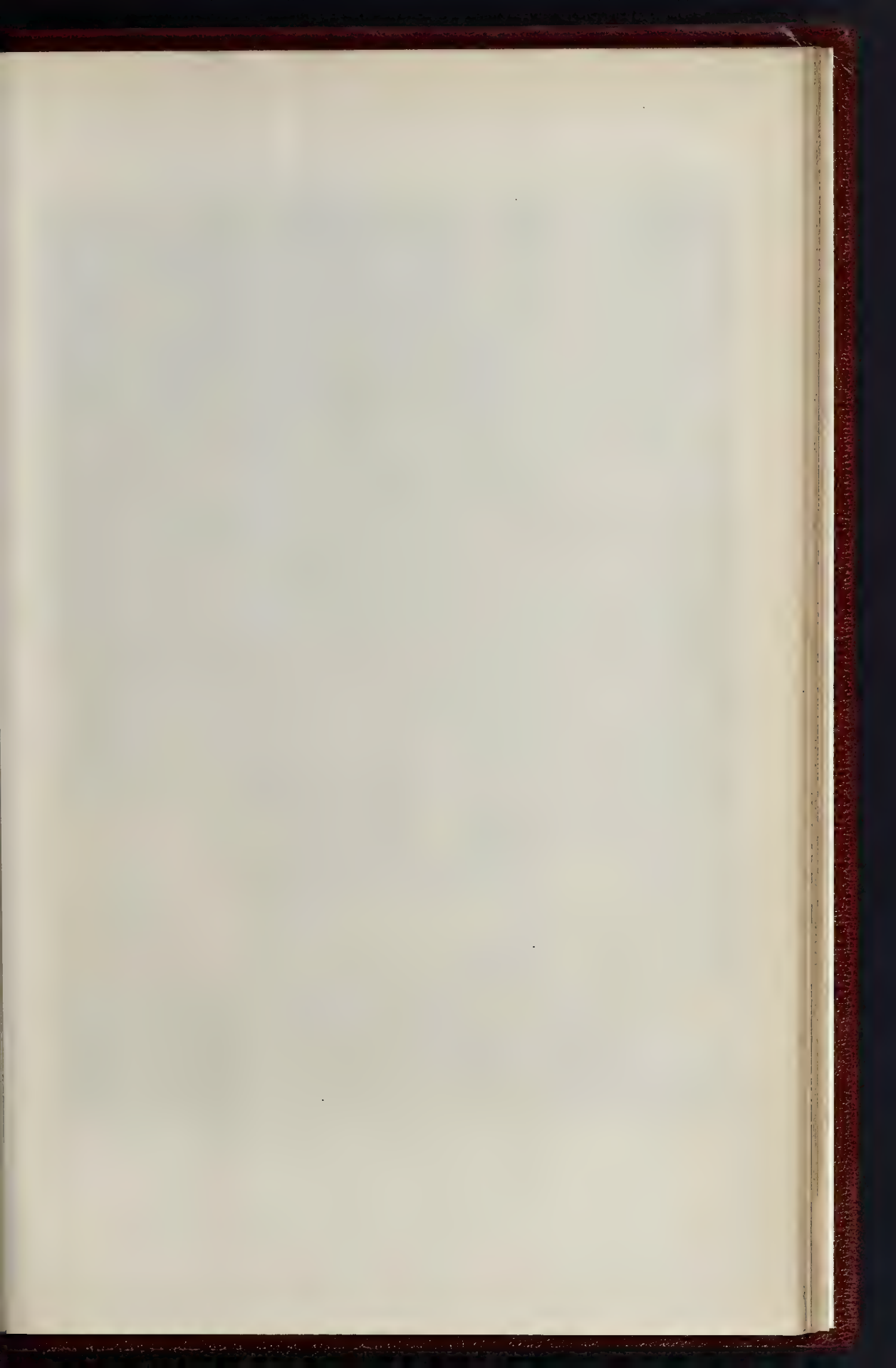






ST. JOHN'S CHURCH, DRESDEN.—HERR G. L. MÖCKEL, ARCHITECT.

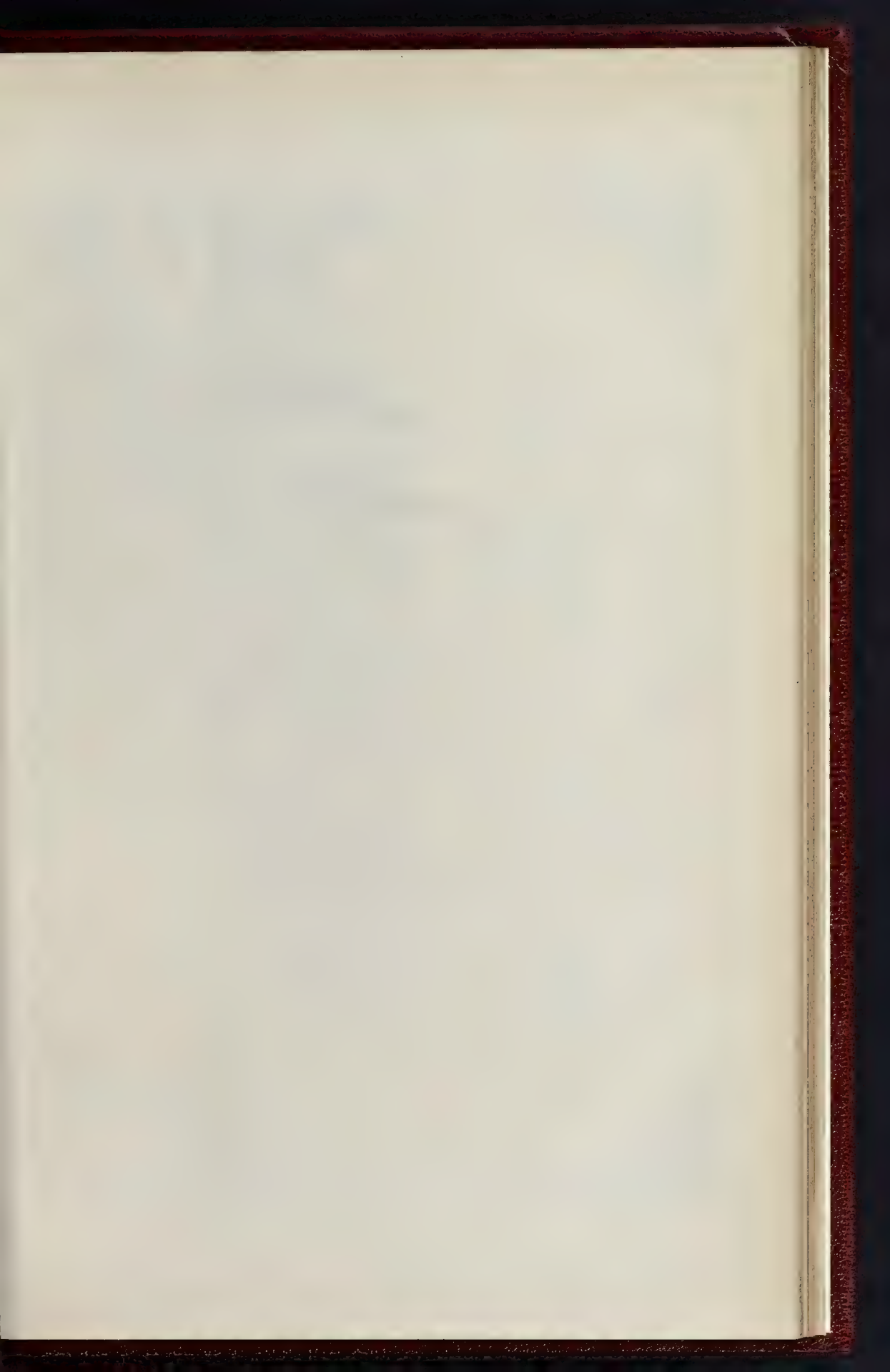




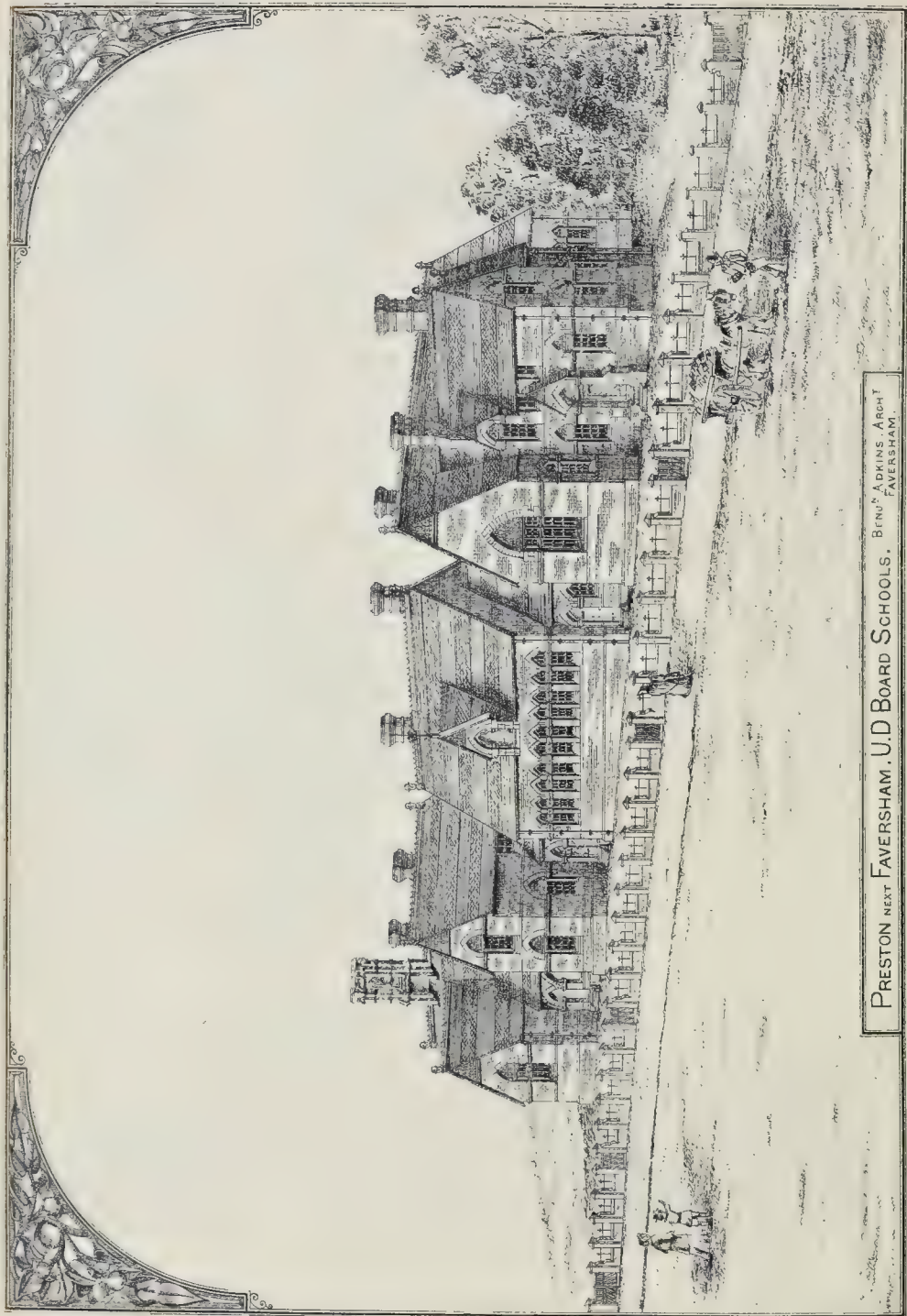


CANTERBURY \* CATHEDRAL \* VIEW \* IN \* CRYPT \*





THE BUILDER, JUNE 17, 1882.



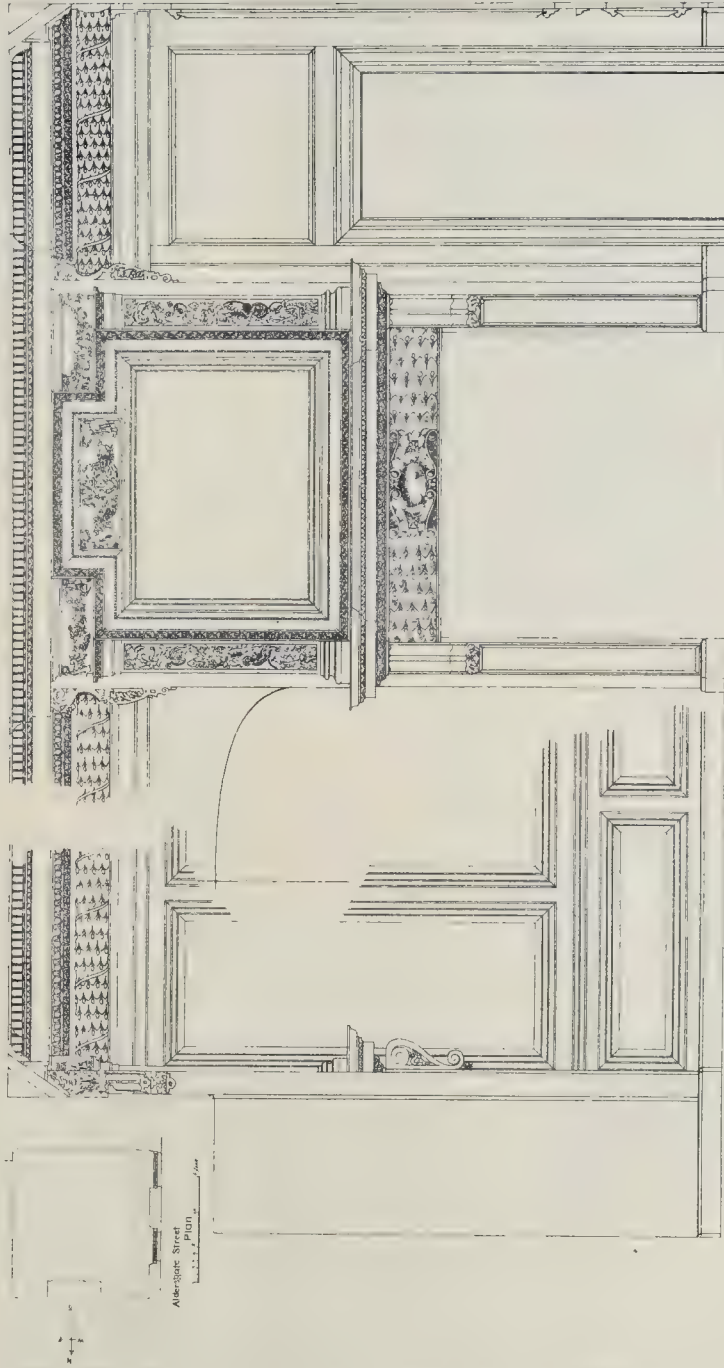
PRESTON NEXT FAVERSHAM, U.D. BOARD SCHOOLS. BENJ<sup>n</sup> ADKINS, ARCHT. FAVERSHAM.











Side Elevation.

Front Elevation.

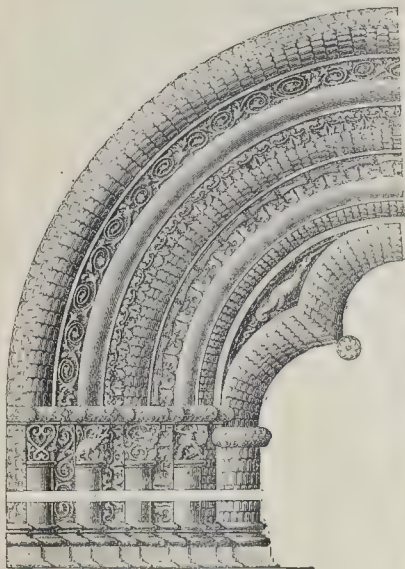
Scale of feet

A PANELLLED ROOM: By INIGO JONES.

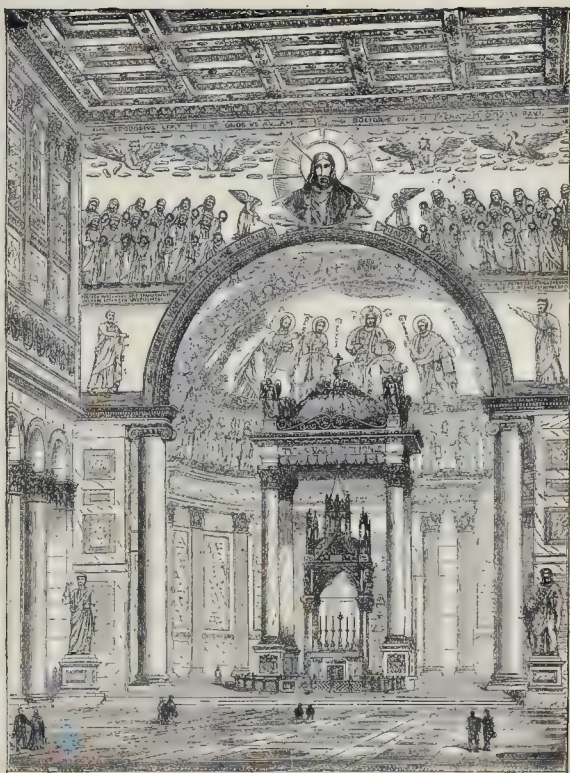
Wm. & Sons, Printers, 20, Queen St.







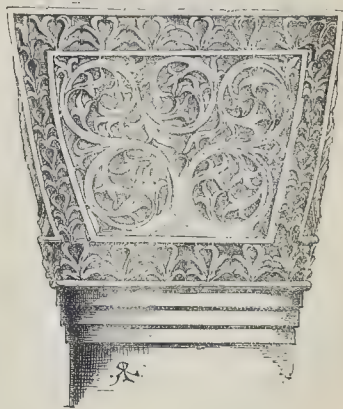
*Mouldings of Portal of St. James's Church, Koesfeld.*



*Apse of Basilica of St. Paul without the Walls, Rome.*



*Church of St. Sernin, Toulouse.*



*Byzantine Basket-work Capital from San Michele in Affricisco, Ravenna.*

[See p. 730, ante.]





## A PANELLED ROOM IN SHAFESBURY HOUSE.

SHAFESBURY HOUSE, originally Thanet House, on the east side of Aldersgate-street, was designed by Inigo Jones for the Tuftons, Earls of Thanet, whence it passed into the family of Anthony Ashley Cooper, Earl of Shaftesbury. In 1708 it returned to the Thanet family; in 1720 it became an inn; in 1734, a tavern; in 1750, a lying-in-hospital; and in 1849, a dispensary. The facade was of red bricks, decorated with eight pilasters of stone and carved Ionic caps.

Not long ago we gave a sketch of the exterior and an account of the building.

We are indebted to Mr. F. C. Penrose for a drawing he has had made of the wainscoting of a room in this building by Inigo Jones, which has just been pulled down, and have reproduced it in our present number.

It is understood that Inigo Jones's work will not be entirely lost, but the wainscoting and Ionic pilasters are to be re-erected in a gentleman's house in Devonshire.

## THE GROWTH OF AMERICAN CITIES.

THE enormous growth of the United States is a fact not only of general interest to the world at large, but it is a fact of more than ordinary importance to the architect and builder. The mere circumstance that the States are increasing their population at the rate of more than a million a year, and that there are a couple of hundred thousand families every year in want of new houses—this is something, but not all. In the freshly-settled parts in the backwoods there is little or no occupation for architects at first. The settler runs up his log-cabin as best he may, and houses are more frequently of timber than of stone or brick. But the treasures in, on, and under the soil are so rich, and the industrious Americans accordingly grow wealthy so fast, that it is not long before there is a demand for brand new villas, houses, schools, churches, and workshops, all of more or less solid and ornate character. Indeed, without exception, the United States and the British colonies, especially in Australia, are the finest fields for architects and builders in existence, and as time goes on they will continue to offer increasing attractions to these professions. Between the present year and the year 1900, the States, which at this moment have a population of about fifty-three millions, will have increased their inhabitants in all probability to nearly ninety millions. Within the next eighteen years there will have to be built within the frontiers of the Republic ten million new houses for the additional population which will have sprung up or settled there. And this is independent of the enormous requirements of the older population in the way of dwelling-houses, and independent likewise of the public buildings, workshops, &c., the demand for which will increase in almost geometrical ratio every year for a long time to come. With such a field open before them, young architects who have no certain prospects in the old country have no occasion to despair.

One feature of the recent progress of the States is the rapid increase of its cities, both in number and size. In 1880 there were ten cities in the Union with more than 200,000 inhabitants each, twenty cities with more than 100,000, thirty-five with more than 50,000 and 100 with more than 20,000 inhabitants. Such a growth of cities and of urban population, the best of all fields and patrons of the builder and architect, has never been known in history before. And yet the next twenty years will see an incomparably greater growth than even this. The United States are not simply attracting every year more settlers from Europe, but every year their own natural increase of population is growing larger and larger. New York, with its belt of neighbouring cities, will, in another half-century, probably equal if not outnumber London itself. London within the Metropolitan Police District,—that is, the largest sense in which the name is applied,—has now approaching five millions of inhabitants. New York, with Brooklyn, Jersey City, Hoboken, &c., already has two millions. How the American cities have increased within the past ten years may be seen from the following figures:—New York increased its population from 942,292 in 1870 to 1,206,399 in 1880; Brooklyn, from 396,090 to 569,663; Philadelphia, from 674,022

to 847,170; Chicago, from 298,177 to 503,185; Boston, from 250,526 to 362,839; St. Louis, from 310,864 to 350,518; Baltimore, from 267,354 to 332,313; Cincinnati, from 216,329 to 255,139; San Francisco, from 149,473 to 233,959; and New Orleans, from 191,418 to 216,080. Out of the total population of the States, the number of persons living in cities or towns of more than 20,000 inhabitants, in 1870, amounted to no fewer than 8,010,614, or about one-sixth of all the inhabitants, and it is almost a certainty that the cities will increase twice as fast, and some of them will double and quadruple their size before the remaining eighteen years and a half of the nineteenth century have passed over our heads.

## THE BROMPTON HOSPITAL FOR CONSUMPTION.

ON Tuesday afternoon the Earl of Derby formally opened the new extension building of the Hospital for Consumption and Diseases of the Chest, Brompton.

This building, designed by the late Mr. T. H. Wyatt, and completed by his son Mr. Matthew Wyatt, has been constructed for 137 in-patients, and an extensive Out-patient Department. It is situated on the south of the Fulham-road, and connected with the parent hospital by a tunnel beneath the roadway. Built of red brick, with terra-cotta and Ancaster stone, it takes the form of the letter E, the two end wings looking south, the main body of the building facing north; it is 200 ft. long and 100 ft. high.

The basement contains compressed air and Turkish baths, rooms and stores for steward and housekeeper, &c.

The ground floor has a central entrance hall, flanked on the east by a large Out-patient department (194 ft. high), and on the west by rooms for the resident staff, a mezzanine for the nurses, and a lecture-room.

The first, second, and third floors are devoted to In-patients; each floor consisting of a corridor (10 ft. in width) which runs round the north and east sides of the building, in the centre of which is a large dining-room, ten wards (13 ft. high), holding from one to eight beds, forty-six in all; two nurses' rooms, slop sinks and lavatories, and two inhaling rooms. The average floor space per bed is 115 ft., the cubic space being 1,400 cubic feet.

The top floor contains the kitchen, with rooms for the night nurses and servants.

The ventilation is maintained independently of the windows and fire-places, and supplies 4,000 cubic feet of air per hour to each patient. The air is admitted by numerous openings placed on a level with different floors; on the east and north into the galleries on the west and south into the wards, the greater portion being heated by passing over coils of hot-water pipe; part is admitted directly, the quantity of hot and cold air being modified at will, and the temperature capable of being evenly maintained. The foul air is drawn off from the corridors, wards, &c., through extracting flues built in the walls, and furnished with openings at floor and ceiling. These flues run into large air-ducts beneath the roof, which communicate with four towers heated by steam coils, forming the exhausting chambers.

The heating and ventilation have been carried out by Messrs. Haden & Son, of Trowbridge.

Lavatories (twelve) and baths (two) stand on the north of corridor by themselves; and the slop sinks (two on each floor) are situated in small annexes.

The flooring is constructed on Messrs. Fox & Barrett's fire-proof principle, and has a sub-floor of deal with teak above, which will be waxed.

There are two principal staircases of teak in the centre of the building, and two stone staircases in the wings.

Communication is maintained between the new and the old building by the telephone, and in the new building by electric bells and speaking tubes.

There are three hydraulic lifts: one for passengers, &c., two others smaller for food, &c., from the kitchen to the basement. These have been constructed by Messrs. Easton & Anderson.

Messrs. Higgs & Hill, South Lambeth, are the general contractors for the building.

In our volume for 1879 (pp. 1,291-95), we gave a view, description, and plans of the building.

## AWARDS, SMOKE ABATEMENT EXHIBITION.

THE following is a further list of awards made in connexion with this Exhibition:—

*Open Grates for Bituminous Coal.*—Brown & Green, underfed grate, gold medal; Clark, Bunnett, & Co., Ingram's grate, with Walsand and anthracite, and E. H. Shorland, Manchester ventilating grate, silver medals. E. R. Holland, underfed grate, H. E. Hoole, radiating and reflecting grate, Feetham & Co., basket dog grate, J. M. Stanley, hopper-bottom fed grate, T. E. Parker, and Reeves & Henry, respirator grate, bronze medals. Doulton & Co., tile grate, Rosser & Russell, and G. Haller & Co., Kohlhöfer hot-air stove, honourable mention.

*Open Grates for Smokeless Coal.*—Coalbrookdale Company, Kyrie grate, and Yates, Haywood, & Co., back and side draught ventilating grate, silver medals; M. Perret, bronze medal.

*Close Stoves for Bituminous Coal.*—C. B. Gregory, J. Cornforth, "Little Wonder," and R. W. Crosthwaite (with Gregory improvement), silver medals; J. F. Farwig & Co., and J. Dunachie, bronze medals; Rev. H. J. Newcombe, honourable mention.

*Close Stoves for Smokeless Fuel.*—W. Barton, F. Lohndolt, Musgrave & Co., slow combustion, H. J. Piron, and H. Hunt, Crown Jewel, bronze medals.

*Kitcheners.*—T. J. Constantine ("Treasure" range), Eagle Range Company, Radiator Range Company, Brown & Green, and Falkirk Iron Company Dr. Siemens's principle, silver medals; Newton, Chambers, & Co. (Thorndike range), W. Stobbs (anthracite range), and M. Feetham & Co., bronze medals.

## THE GAS INSTITUTE.

THE 19th annual general meeting of the members of the Gas Institute was opened on Tuesday at the Institution of Civil Engineers, Great George-street, Westminster.

In his address, the president, Mr. George Wilson Stevenson, after reminding them of the alteration in their name, "The British Association of Gas Managers," said that the competition by light-producers for the custom of the public had never been so brisk and keen as it was at the present time. The electric light had come upon them, not as a novelty, but as a somewhat more practical competitor than formerly for the favour of the public. Candles and oil lamps had long had to yield the precedence to coal gas, both for efficiency and cheapness. The electric light would and must be further improved and cheapened, and it was just in the proportion that its promoters were successful in improving and cheapening it that it would become formidable as a competitor with gas for the lighting of our streets and dwellings. At present they had really nothing to fear from it, but its very presence among them ought to stir them up to maintain the supremacy they held. Referring to certain methods by which the supply of coal gas might be so cheapened and used as to accomplish this end, he observed that the first point was the improved carbonisation of coal. Within less than twenty years 8,000 ft. of gas sold from a ton of coal was considered excellent working, but it was now possible to sell from 9,000 ft. to 10,000 ft., or more, per ton of coal carbonised. Yet, notwithstanding their amended processes of condensing, scrubbing, purifying, and to some extent storing gas, nothing had been practically accomplished in the way of distilling coal by passing it continuously through a retort with a constantly closed entrance, and thereby getting a larger yield of gas per ton of coal, and a uniform make of gas per hour, both as regarded quantity and quality. Experiments, however, had been, and were being, made, with a view to bring to perfection an improved method of carbonisation on this principle. They could readily conceive what a different place the retort-house would be if the drawing and charging of retorts were abolished. Improved carbonisation, too, had a directly cheapening effect upon gas, and increase of business was another very important cheapening element. Local exhibitions displaying the best cooking and warming stoves, &c., and the best burners, would excite the curiosity and instruct the minds of the general public, and lead many to use gas for domestic and industrial purposes.



## LOCHLEVEN.

EDINBURGH ARCHITECTURAL ASSOCIATION.

The members of this Association held their annual excursion on the 3rd, when a party of thirty visited Falkland and inspected the Palace, where Mr. Andrew Kerr, architect, gave an interesting description of the building.

The south or street side was first erected, and the east and north sides afterwards by James V., who reigned for a period of twenty-nine years. Sir James Hamilton, of Finnart, is usually named as the architect who designed and superintended the erection of the Palace. He was a natural son of the first Earl of Arran, cup-bearer to James V., and superintendent of royal palaces. He was convicted of high treason and executed in 1540. After the death of James V. his widowed queen, Mary of Guise, often resided at Falkland Palace. Her daughter, Mary Queen of Scots, also made frequent visits to it during her troubled reign. James VI. seems to have made it almost a favourite residence, even when he was King of Great Britain. He made his last visit in 1617. Charles I. and II. also resided here for short periods up to 1651, when Charles II. paid his last visit. This interesting building and grounds have long since passed away from the Crown, and are now the property of Mr. O. Tyndall Bruce.

The excursionists then went on to Lochleven, a distance of about twelve miles, through a fine undulating country, diversified with large hedge-rows and clumps of trees. Passing through several old villages, many interesting features were observed upon the cottages, middle-class houses, churches, and town-halls, now fast wearing out. These were rendered still more pleasing by the small gardens interspersed with hawthorn, lilac, and rowan trees in blossom. The towers of the town-halls were generally square, terminating in a balustrade, and rather severe-looking plain stone spire. Upon one of the towers, instead of the usual clock, a bold corbel was projected, supporting a shaft and quaintly-formed dial. The plain cross-stepped gable and lofty chimney were prominent features upon the older domestic buildings, many of them being roofed with reeds, straw, tiles, and grey slate, presenting very effective groups in form and colour. On arriving at Lochleven, such of the party as could obtain boats visited the Castle Island, and surveyed the buildings there. The island had an area of about five acres, which was much increased when the water was lowered 4 ft. 6 in. in 1830. An ancient causeway below water extends from the island to the shore, but under the most favourable circumstances the communication is both difficult and dangerous. The original fortalice out of which Lochleven Castle sprang is said to have been built by Congal, the son of Dougart, king of the Picts. The present castle, now in ruins, with its courtyard, occupied a considerable portion of the island, the remainder having been laid out in garden and pleasure grounds. The great tower or keep stands in the north-west corner of the court, and is of a square form, four stories high, with walls 6 ft. thick, and corbelled bastions at three of the corners; it had also a timber roof and gables, which fell many years ago. The entrance is in the second story connected by an outside stair, and a small drawbridge at the top; when drawn up it formed the outside entrance-door. The door opens into the great hall, occupying the second flat of the building; within the doorway is a square opening into the vaults below, either for obtaining access or elevating supplies, or perhaps assailing hostile parties in the event of the lower vaults having been forced. The present lower doorway is recently introduced. The two upper floors appear from the markings upon the walls to have been divided into chambers of various sizes. The courtyard, surrounded by walls flanked with towers at the corners, contains a variety of buildings for domestic purposes, besides accommodation for a garrison and a chapel, the site of which is pointed out a little to the west of the keep. One of the towers at the south-east corner of the court-wall is said to have been the one in which Mary Queen of Scots was confined. No date can be assigned to this island fortress. The causeway already noticed, and occupation by the Picts, suggest its being of great antiquity; it was besieged in 1335 by the forces of Edward III., and defended for David II. of Scotland by Allen de Vispoint. The besiegers raised a bulwark at the outlet from the loch, expecting to lay the castle under water, which

certainly rose to such an extent as to encourage their hopes of success, but many of them having gone to Dunfermline to join in the celebration of the festival of St. Margaret, the besieged embraced the opportunity and broke the bulwark, allowing the pent-up waters to rush so furiously as to entirely overwhelm the English camp. But the castle derives its chief historical interest from Mary Queen of Scots having been confined here for about eleven months in 1568. Here she resigned her crown in favour of her infant son. The Earl of Northumberland was also confined here from 1569 to 1572, when he was surrendered to Queen Elizabeth, who condemned him to death. The fortalice and castle have evidently been subjected to many alterations and additions to meet the progressive defensive necessities of the several periods until about the close of the sixteenth century, when, from the improvements in artillery, even its isolated position became a matter of inconsiderable importance. Alphonse de Lamartine, in his "Life of Mary Stuart," describes the castle as being built of granite flanked by heavy towers, whereas it is constructed of the local freestone from Nivingstone, near the neighbouring village of Cleish. Although the details are scanty, there is sufficient to induce the architectural student to devote some time to their careful examination. The proprietor, Sir Graham Montgomery, manifests a deep interest in protecting these historical ruins; and Mr. Robert Burns Begg (grand-nephew of the poet), in whose charge they are placed, attends to their preservation in the words of his illustrious ancestor, even "wi' miser care."

## STONE SCREEN, ETON COLLEGE CHAPEL.

The organ-screen executed by Mr. Earp, of Kennington-road, from the design of the late Mr. Street, has been opened. This screen, executed in Caen stone, is designed with a main central arch from west to east, richly groined, and supported by two semi-octagonal turrets; that in the north side containing the steps leading to the organ, and that on the south side having two air-tight chambers for conveying wind to the organ. These turrets are flanked by smaller arches abutting on to the walls of the chapel, and are also groined. The dimensions of the screen are 36 ft. in length, 20 ft. high, and 10 ft. from west to east. On the eastern arch is a corbelled balcony, finished with an open parapet of traceried oak.

## BRITISH ARCHÆOLOGICAL ASSOCIATION.

The closing meeting of the session was held on the 7th inst., the Rev. S. M. Mayhew, in the chair. It was announced that his Grace the Duke of Somerset had been elected president of the Association for the ensuing year, and that the annual Congress would commence at Plymouth on the 21st of August. Visits will be paid to Totness, Dartmouth, Berry Pomeroy, Tavistock, and other places of interest in the locality.

Mr. J. Gunn called attention to the mutilation, many years ago, of some of the piers supporting the central tower and spire of Norwich Cathedral, and made suggestions for their being strengthened; Mr. Earle Way exhibited a large number of Roman articles found in Southwark; Mr. C. D. Sherborn produced a representative collection of flint and stone implements from America and European countries; Mr. C. H. Compton described a fine collection of flint objects, some from Athens, and many recently discovered in London, among which was a standing lamp of leather, formed evidently by compression in a mould; Mr. Loftus Brock, F.S.A., exhibited a series of Venetian beads, found in Aldgate; the chairman described a large number of beautiful objects which he produced, among which a jewelled cross and a silver cover to a Roman thurible were of great interest.

The first paper on "Cuddy's Cove, Northumberland," by Dr. Alfred C. Fryer, treated of a little-known natural cavern, the traditional place of abode of St. Cuthbert. Various references to Bede's History appeared to point to the locality, and to give ground to the tradition.

The second paper was by Dr. J. Stevens, on "Urn Burials at Basingstoke." During some recent building works two grave-like excava-

tions in the chalk have been found, in which were various food-vessels and other vases of late British date. All appearance of interments, apart from these, had disappeared.

The third paper was by Mr. Walter Myers, F.S.A., on "A Roman Villa at Benizza, near Corfu." A fine building has been discovered, the plan of which was exhibited, and the arrangements, here in a very perfect state, throw light on similar buildings found in England in a more dilapidated condition.

The proceedings were brought to a close by remarks from the chairman on the success of the session now concluded.

## CROMWELL BRIDGE, SALFORD.

This new structure, which was opened on Saturday last by the Mayor of Salford, has been constructed by the Pendleton district, across the river Irwell, at a point opposite Great Cheetham-street, Lower Broughton. It has been built on the lattice-girder principle, is ornamental in design, and rests upon abutments of solid Yorkshire stone. It has a single span of 125 ft., having been made extra wide in order to allow of considerable improvement in the channel of the river, with the view of preventing floods in Broughton. The bridge has been erected at a cost of 10,000. From designs by the borough engineer, Mr. Arthur Jacob, and the whole of the expenditure will be borne by the Pendleton district with the exception of a contribution of 5000. Made by the trustees of the late Mr. J. P. Fitzgerald. The work has been carried out under the directions of the borough engineer by Messrs. Pilling & Co., contractors, Manchester.

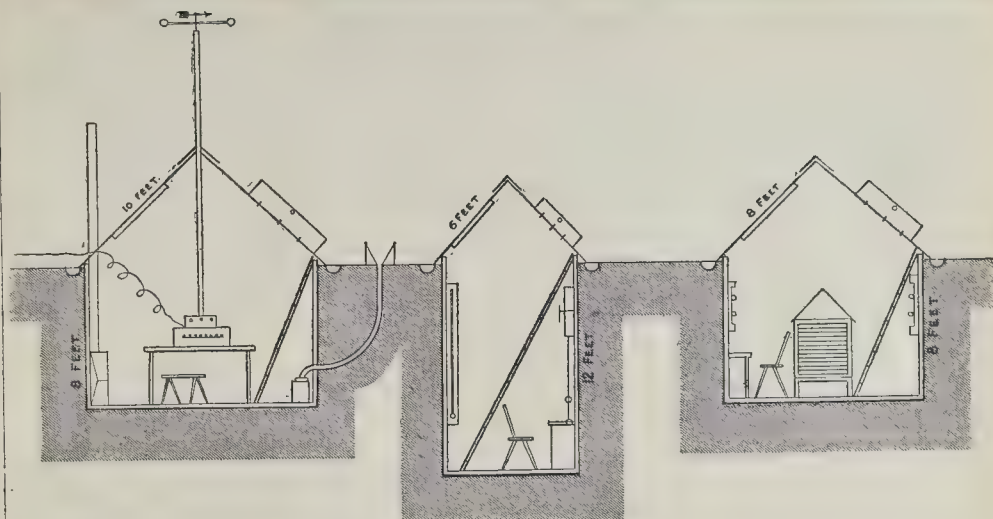
Alderman Bowes, chairman of the Pendleton Highways Committee, in the course of some remarks made on the occasion, gave an interesting sketch of the recent development of Salford and Pendleton. Some seven or eight years ago, he said, the times were very prosperous in that district, and buildings were being rushed up in all directions. In Pendleton alone people were building at the rate of 800 houses per annum. Works were springing up in all directions, and from the Salford Station, for two miles out along the line of the canal and railway, there was not a site to be had for works. Landowners were selling their land indiscriminately, and builders were putting up streets in all directions, and it occurred to the Pendleton committee that, as they had a wide area, nearly as large as that of both Broughton and Salford put together, if ever they were to have any main and leading thoroughfares it was time to look after the matter. Just at that time the Salford Corporation were going for a new Act of Parliament, and certain leading thoroughfares, of which Cromwell-road was one, were laid out and embraced in that Bill. That bridge and road were intended to form a connecting link between Pendleton, Higher Broughton, Crumpsall, Cheetham, Prestwich, and Bury, and also to open out a large extent of land which would be valuable for building purposes, thereby increasing the rateable value of the district. The landowners met the committee in a fairly liberal spirit, for they gave the land for the formation of the roads, and 5000. towards the erection of the bridge, and when the land adjoining the road should be sold for building purposes the owners would repay the committee the cost of paving and sewerage of the road. It could not be doubted that had the committee waited some years it would have cost them ten times the amount of money to make the bridge. That was the nineteenth bridge that had been erected within the precincts of the borough, and he might safely say that for neatness of design and for adaptability to the purpose for which it was intended, it was surpassed by none. The Trafford Bridge, with a span of 116 ft., cost 29,6000.; the Wall-ness Bridge, with a span of 112 ft., cost 25,0000.; the Irwell Bridge, with a span of 116 ft., cost 23,0000.; and the Cromwell-road Bridge, with a span of 125 ft., had cost only 10,6000. The bridge was wide and high enough to take the largest flood that had ever occurred in the Irwell within the memory of man.

## CLEANING TILES.

STR.—Will any one inform me of a good method of cleaning unglazed tiles? I find it impossible to have my wall (which has a good deal of pale yellow in it) kept clean by scrubbing alone.

M. BROWN.





MOUNTAIN WEATHER OBSERVATORIES.

## MOUNTAIN WEATHER OBSERVATORIES.

I BEG to send for consideration the inclosed scheme for the construction of shelter huts on mountain summits for meteorological observatories, such as Ben Nevis, &c. Where means are not obtainable to meet the expense and build regularly appointed towers, as in France, it is proposed by this scheme to sink pits in the soil or rock to station the instruments in, as a less costly and more accessible plan. The pits might be square or circular in shape, and lined throughout with concrete, projecting up above the top all round a little, so as to attach the roof to it.

On the top they would be covered by roofs of corrugated iron or flagstone as would be found best adapted, and they would be pyramidal or conical in shape. A window of strong glass could be let in on one side, and a door placed in on the other side.

A ladder would afford the means of descent into each pit, and a stove with chimney projecting through the roof, could be fitted in one pit, and it might be furnished with table and chair for the observer's convenience.

An electrical apparatus could be fitted up in one pit to pass information up and down between the observer on the top and the station or office situated at or near the base of the mountain.

An observer would be enabled to remain overnight sometimes, as there would be fire and furniture provided. The instruments could be attached to wooden frames and hung round the walls inside, or placed in the middle of the pits, as found most suitable for the objects of correct registration.

These shelter huts might be made quite water-tight, and would be impregnable to storms of snow or wind, and the roof might bear any amount of snow lying on them in winter without injury.

In order to admit of the outside air obtaining circulation through the interior of the pits when the doors and window were closed, fenestrated louvres could be placed on the summits of the pointed roofs, so as at the same time to exclude the rain entering.

The rain-gauge could be placed outside on the hill top, and its contents might be carried into a jar in one of the huts by means of a sunken pipe in the ground, and these registered.

The drainage of the roofs could be led off by means of gutters placed round each hut, and carried off by a ditch cut in the soil, and lined with concrete, down the hill side.

The accompanying rough section will further explain my idea.

W. J. BLACK, F.M.S.S.

## OBITUARY.

Mr. John Scott Russell, C.E., F.R.S., died on the 8th inst., at Ventnor, Isle of Wight, in his seventy-fifth year. According to *Engineering*, he was the eldest son of the Rev. David Russell, a Scotch clergyman. He was born in the Vale of Clyde, in the year 1808, and was originally destined for the Church. His great predilection for mechanics and other natural sciences induced his father to allow him to enter a workshop to learn the handicraft of the profession of an engineer. He subsequently studied at the Universities of Edinburgh, St. Andrew's, and Glasgow, and graduated at the latter at the early age of sixteen. He had attained to such proficiency in the knowledge of the natural sciences that on the death of Sir John Leslie, Professor of Natural Philosophy in Edinburgh, in 1832, the young Scott Russell, though then only twenty-four years of age, was elected to fill the vacancy temporarily, pending the election of a permanent professor. About this time he commenced his researches into the nature of waves, with the view to improving the forms of vessels. His first paper on this subject was read before the British Association in 1835. The interest created by this paper was so great that a committee was appointed by the Association to carry on the experiments at their expense. Being employed at this time as manager at the large shipbuilding establishment at Greenock, now owned by Messrs. Caird & Co., he succeeded in having his system employed in the construction of the new fleet of the West India Royal Mail Company, and four of the largest and fastest of these vessels, — viz., the *Teniot*, the *Tay*, the *Clyde*, and the *Tweed*, were built, and designed by himself. In 1844 Mr. Scott Russell removed to London. In 1847 he was elected a Fellow of the Royal Society and member of the Institution of Civil Engineers, of which body he was for some time a vice-president. For a short time he acted as secretary of the Society of Arts, which place he resigned to become joint secretary with Sir Stafford Northcote of the Great Exhibition of 1851. He was, in fact, one of the three original promoters of the Exhibition, and under the direction of the late Prince Consort took a leading part in organising it. Mr. Scott Russell was for many years known as a ship-builder on the Thames. The most important work he ever constructed was the *Great Eastern* steamship, which he contracted to build for a company, of which the late Mr. Brunel was the engineer. Mr. Scott Russell was one of the founders of the Institution of Naval Architects, and was one of its vice-presidents from the date of its

constitution down to the day of his death. His greatest engineering work was, without doubt, the vast dome of the Vienna Exhibition of 1873. This dome is, among roofs, what the *Great Eastern* is to ships, its clear span of 360 ft. being by far the largest in the world. The last engineering work which Mr. Scott Russell ever designed was a high-level bridge to cross the Thames below London Bridge. It was intended to cross the river with a span of 1,000 ft., and to allow of a passage beneath it for the largest ships that could come up to that part of the river.

Mr. Cecil G. Lawson. — We record with regret the death of Mr. Cecil G. Lawson, the landscape painter, at the early age of 30. The interment will take place at Haslemere, Surrey, this Saturday, the 17th instant.

## ELECTRIC RAILWAY IN HOLLAND.

ON Friday last week the first electric railway in Holland was opened. The line goes from the bath Zandvoort, near Amsterdam, to a little park in the neighbourhood, called "Kostverloren." The distance is only one kilometre and a half; the rails are laid one metre apart. The system used is that of Siemens & Halske, of Berlin. The line is worked by a steam-engine of fifteen horse-power. The wheels are attracted by the rails, but are turned round by another engine attached under the comfortable little carriage, which can accommodate twenty passengers. In four minutes the distance is done; there is hardly any motion perceptible in the carriage, even when the rapidity is the greatest.

Association of Municipal and Sanitary Engineers and Surveyors. — The annual meeting is to be held in London on the 29th and 30th June and 1st July next. The business on Thursday, June 29th, will include, 12 noon, annual meeting of members in Council-chamber of the Institution of Civil Engineers, and a paper and discussion: "Private Roads and the 152nd Section of the Public Health Act," by H. Oliver Smith, C.E., and the annual dinner at the Criterion Restaurant, Piccadilly. On June 30th, papers and discussion: "Gas as an Illuminating Agent compared with Electricity," by W. Suggs, Assoc. Inst. C.E. "Sanitary Legislation," by G. B. Jerram, Assoc. M. Inst. C.E. And the members will visit the headquarters of the London Fire Brigade, Southwark. On July 1st the members will visit Messrs. Doulton & Co.'s Pottery Works, Lambeth, the House of Commons—ventilating arrangements, &c., and the New Law Courts.

# MIDDLESEX INDUSTRIAL SCHOOL FOR GIRLS, BEDFONT, NEAR FELTHAM, MIDDLESEX.

This school is to be built on the cottage or family system. The first of two houses has been completed, and will contain fifteen girls, a proper number, as the committee consider, to secure efficient training and supervision. They consider, too, that not more than two buildings, each containing fifteen inmates, should be erected on the same site. The girls are to be received under the provisions of the 29 & 30 Vict., c. 118, and under the 14, 15, 16, and 17 clauses only.

The school is to be a Church of England school; and the girls are to be educated according to the six standards. Every girl is to be instructed in cookery and the several kinds of household work.

The committee consider that, although the assembling of a large number of boys in one building is adapted for them, it is otherwise with respect to girls, who, in their opinion, should be trained in houses containing only a limited number, in houses similar to those in which they will be employed as domestic servants.

The school has been erected by donations liberally contributed by many of the Middlesex magistrates, and a few of their relations and friends, and to meet the many cases which come under their notice, and to provide a school for cases for which, in their opinion, the present certified schools are not adapted.

The building has been erected with special care with regard to light, air, and ventilation under Mr. Charles Barry, architect, and the works were carried out by Messrs. Perry & Co. There is a good garden, &c., and a very large building fitted up for recreation in all weathers.

# THE CAMBERWELL AND PECKHAM IMPROVEMENTS AND THE METROPOLITAN BOARD OF WORKS.

## GRAVE CHARGES.

According to the proceedings at the Camberwell Vestry last week, the delay which has taken place in carrying out the street improvements in the locality has become a very serious matter for tradesmen and others residing in the neighbourhood. An indictment of a grave and serious nature is preferred against the Metropolitan Board, who are accused of culpable delay in carrying out the works, and also further charged with having improperly conducted the letting of the vacant land for building upon in the thoroughfares to be widened.

The General Purposes Committee recommended that a deputation from the Vestry should wait upon the Metropolitan Board and call their attention to the delay that was taking place in carrying out the works, more especially respecting the putting back the hoardings and making up the paths and roads, causing inconvenience, and in many instances ruin, to the tradesmen carrying on business in the line of route.

During the discussion which took place on the recommendation several members expressed themselves very warmly on the subject, the feeling of the Vestry being unanimous that the Metropolitan Board were blamable in the matter. Amongst the speakers was Mr. Middlemass, who observed that the delay had had a harrowing and ruinous effect upon the tradesmen who had the misfortune to carry on business in the vicinity of the cleared sites. Mr. Wesson added that he had heard statements on every hand from tradesmen with reference to the ruin this delay was creating, inasmuch as the market was gradually being removed from the main thoroughfares. Mr. Turney also observed that a large number of ratepayers would no doubt have a melancholy remembrance of the Camberwell and Peckham improvements.

Mr. W. Lyon was of opinion that the Board had pulled down too much property at once, without making arrangements for rebuilding; and Mr. Lassus remarked that his chief complaint against the Metropolitan Board was with reference to the letting of the vacant land. The tendering was conducted by land-jobbers, to the detriment of others, who would be anxious to make a start with the building work. The price of the land was run up so high that he felt certain that no tradesman who commenced business in the new premises would be able to effect a profit upon his transactions for at least

twenty years. Mr. Sugden thought the Metropolitan Board ought to put up the land in small plots, so as to prevent jobbers and land-grabbers from running up the price. Mr. Davis imagined that the mistake made by the Metropolitan Board was in not putting up the vacant building land to auction.

The Chairman, Mr. Dresser Rogers (who is the representative of the vestry at the Metropolitan Board), deeply regretted the delay which had taken place, remarking that he had tried his utmost at the Board to prevent it. He incidentally stated that the estimated cost of the improvements had increased from 238,000*l.* to 500,000*l.*

It was finally agreed that the deputation to the Metropolitan Board should consist of the whole vestry.

# THE LIVERPOOL OVERHEAD DOCK RAILWAY.

THE project of the Mersey Docks and Harbour Board for the construction of a high level railway along the line of docks at Liverpool has just received the sanction of both Houses of Parliament. The undertaking involves the construction of two railways, one of them being between six and seven miles in length, commencing near the northern boundary of the Board's estate, on the margin of the large new docks which were recently opened between Bootle and Waterloo, and terminating at the Hercules Dock, situated in the parish of Toxteth Park, at the south end of the city of Liverpool. The other railway, which is upwards of a furlong in length, commences by a junction with the first-named railway, at the south-east corner of the Nelson Dock, and terminates by again forming a junction with the same railway at a point close to the Clarence Dock. The line, although short, will be very costly, requiring a considerable amount of engineering, and the construction of several girder bridges or spans over the great thoroughfares leading from the central portion of the city and the adjoining borough of Bootle, to the margin of the river. In order that such communication with the river may not be interfered with, it is provided that the railway shall at six different points, in Bootle, be carried over carriage roads, on open spans of not less than 50 ft. in width each, and of a clear height of 15 ft. between the roadway and the under side of the girders of the bridges. There are likewise to be similar bridges over several of the main thoroughfares within Liverpool itself, including one opposite the end of St. James-street, which is a continuation, in the direction of the river, of Lord-street, the principal thoroughfare in the city. The bridge over this street is to be in two spans of not less than 60 ft. in width each. Other bridges of 50 ft. span each are likewise to be carried over Red-cross-street, and above the open space across the Custom House and Revenue Buildings. Also one of three spans of 50 ft. width each, opposite Orford-street; and another of 60 ft. span opposite the north end of the Wapping Dock warehouses. The line will cross over the Lancashire and Yorkshire and the London and North-Western systems at several points, and in the Act there are clauses protecting the interests of these companies in respect of their various stations at the Alexandra Dock, the Canada Dock, the Waterloo Dock, and the Wapping Dock. The Railway is to be constructed as a double line throughout, and its estimated cost is 650,000*l.*, which the Dock Board have obtained powers to borrow, on the security of the dock rates. The maximum rates to be charged passengers is 3d. per mile for first-class, 2d. per mile second-class, and 1d. per mile third-class.

While the Bill was before the Committee of the House of Commons, Mr. Squarry, the solicitor to the Dock Board, stated, in reply to a question from Dr. Playfair, the chairman, that the Board had already borrowed the large sum of 14,000,000*l.*, but that they had still a very large margin for further borrowing. Mr. Squarry added that it was proposed to lease the line when completed, but the Lords' Committee had made it a condition that the Board should only lease it to a Company incorporated by Act of Parliament. He also observed that the railway was rather an exceptional undertaking, and not connected with any other railway system at all. It was an overhead line, running along the line of docks, the main object being to get quicker access than at present to the various

docks between north and south. It was not in any sense to be a goods line, but for passengers only.

These new works will, doubtless, afford many facilities, but they will greatly damage the appearance of important parts of Liverpool. Everything is sacrificed nowadays to making money and "getting along."

# BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 2,607. W. H. Lindsay, London. Construction of floorings for bridges. June 2, 1882.
- 2,614. C. E. Green, London. Domestic stoves or fireplaces. June 3, 1882.
- 2,656. J. Harris, London. Means for holding up windows. June 6, 1882.
- 2,662. J. Davies, Kearsley Moor. Kilns for burning bricks, &c. June 7, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

June 6, 1882.

- 975. J. R. Nottingham, Washington, U.S.A. Compositions for the manufacture of artificial stone, &c. (Com. by A. Pelletier, Washington, U.S.A.) Feb. 28, 1882.
- 2,302. J. Mitchell, Paris. Manufacture of decorative transparencies for ornamenting windows, &c. May 16, 1882.
- 2,307. F. Versmann, New Charlton. Dry or earth closets. (Com. by H. Klencker, Brunswick, Germany.) May 17, 1882.

June 9, 1882.

- 2,216. T. C. Summers, Portsea. Supply of water to waterclosets, &c. May 11, 1882.
- 2,272. J. M. Hall, London. Stench-traps. May 15, 1882.
- 2,365. W. R. Lake, London. Construction of ceilings. (Com. by J. Budd, Boston, U.S.A.) May 19, 1882.

## ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending June 10, 1882.

- 4,668. A. H. Hearington, London. Stoves for cooking and heating purposes.

These stoves are heated by gas, which is burnt in a compound burner consisting of an inner tube, into which the gas and air are admitted, outside of which is a concentric tube containing water, and passages are made passing through the water space into the place to be heated. Oct. 25, 1881. Price 6d.

- 4,707. J. H. Miles, Southampton. Window-sashes.

This is an improvement on Patent No. 4,523 of 1876, in dispensing with the weights, pulleys, and lines, and making the sash-frames fixtures, in which the glazed frames are pivoted. Oct. 27, 1881. Price 4d.

- 4,741. J. Thomas, Bangor. Chimney-pieces.

These are made of metal plates, constructed in several parts, and enamelled and then built up. Oct. 29, 1881. Price 6d.

- 4,787. J. Dunmachie, Glenboig. Stoves or heaters for apartments.

These are made of fire-clay slabs, held together by a light iron framework. Inside the above, above the fuel space, is a midfeather of fire-clay slabs, which extend from the lower part of the back upwards, in an inclined direction towards the front, over which the products of combustion have to pass, and then descend behind to the flue. Nov. 2, 1881. Price 6d.

- 4,795. G. W. Von Navrocks, Berlin. Kilns for burning bricks, &c.

The heating-chambers are placed below the floor of the firing-chambers, and are connected both with the fireplaces and with the next preceding firing-chamber. (Com. by E. Arnold, Furstenwalde, Germany.) Nov. 2, 1881. Price 6d.

- 4,840. J. B. Spence, London, and E. Ormerod, Belvedere. Manufacture of concrete suitable for receiving an enamelled surface.

This concrete is made of Portland cement, iron or copper slag in powder, and hematite also in powder, which are all well mixed together. To this is then added crushed bricks, ballast, breeze, or pottery refuse, and the whole is mixed together with water. This concrete will stand the heat used in enamelling. Nov. 4, 1881. Price 4d.

- 4,845. J. H. Johnson, London. Apparatus for flushing or cleansing water-closets, &c.

A syphon is placed in the cistern, into which water is admitted very slowly through a small aperture, and the syphon empties the cistern periodically. (Com. by T. Guinier, Paris.) (Pro. Pro.) Nov. 4, 1881. Price 2d.

- 4,862. J. Harley, Glasgow. Astragals and sash-bars for carrying glazing, &c.

A hollow tubular metal core carries a system of sheet lead glazing attached to it. The sheet lead forms the lining of the gutter and secures the glass. (Pro. Pro.) Nov. 7, 1881. Price 4d.

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.



## VALUE OF LAND IN PARIS.

The compensation paid for the houses Nos. 3, 3a, and 5, Rue Vivienne, Paris, which were required by the municipality for the enlargement and isolation of the National Library, amounted to 2,115,000f. (84,600l.). The two houses numbered 3 and 3a formed one house, used as a hotel—the *Hôtel des Etrangers*; these were acquired by arrangement for 1,695,000f. (67,800l.). The area was 1,116 mètres, and the price paid per square metre was 1,560f. (63l.), or 54. 17s. 6d. per square foot,—an amount much less than that which is realised for land in the principal thoroughfares in the City of London.

The trade compensation amounted to 510,000f. (20,400l.), making a total of 2,205,000f. (88,200l.) for the two houses. A sum of 111,700l. has been already expended out of 152,000l., which has been voted for this important improvement.

## STONE-WORKING MACHINERY.

STONE-WORKING machinery will be more used than it is. Messrs. Rotheroe, Sherwin, & Co., of King William-street, are making machinery for sawing, moulding, surfacing, and polishing stone, marble, and granite which will work its way into many yards. Their stone and marble sawing machines, with timber framing, are of various sizes, to take in blocks of stone or marble up to 10 ft. by 8 ft. by 6 ft. or larger, if required. Blocks are cut into any number of pieces, as may be wanted. The vibrating frame is strongly made, and provided with convenient means for setting the saw blades, the number of which will vary from one to twenty-eight.

The pendulum, giving motion to the vibrating frame, is arranged so that the latter can be worked through blocks of stone of considerable depth.

The rubbing bed or surfacing machine is one of the most useful that a stonemason can employ. The revolving top is made from a select mixture of cast-iron; the diameter varies from 7 ft. 6 in. to 14 ft., according to the requirements of the purchaser. The centre shaft is of best iron, and provided with all the necessary bearings, bushes, transverse blocks, steel rest, and journals complete, and fitted with simple and effective means for adjusting the table vertically and horizontally, bevel gear, driving pulleys, &c.

The stones, in their rough condition, are placed on the bed of this machine, and there receive a true and smooth surface, no matter how hard the stone may be. The saving effected by the use of this machine is great.

We must add a word for the improved machine for planing and moulding stone. This will make mouldings of any required design with accuracy of finish beyond that obtained by any hand labour. For steps, architraves, strings, cornices, and other straight mouldings, it seems an excellent machine. Many of the eminent builders in London have had these machines in use for some time, and the results obtained have exceeded their expectations.

## STAINED GLASS.

*Kingebury.*—Two windows have been fixed during the past month in the south side of the chancel of Kingebury Church. The first window contains the following subjects:—First light, Dorcas distributing the garments her hands had made to the poor; centre light, the distressed widows showing the garments (made by their benefactors) to St. Peter; third light, St. Peter presenting her (restored to life) to the rejoicing widows. The second window contains, as a central subject, Our Lord delivering Peter from a watery grave. The side lights contain figures of SS. Peter and Paul, to whom the church is dedicated. A third window, the gift of Mr. A. Coleman, is placed over the font, the subject being St. Christopher crossing the river, bearing our Lord, lighted by the torch of the hermit ferryman. The chancel also has been cleaned and coloured preparatory to decorating. The whole of the windows have been executed by Messrs. Camm Brothers, of Smethwick.

*West Newton Church.*—This church has recently been restored at the cost of H.R.H. The Prince of Wales, by Mr. A. W. Blomfield, M.A. Two stained-glass windows have recently

been placed in the Church. One, illustrating the subjects of the Baptism of our Lord and the Passover, is the joint gift of their Royal Highnesses the Duke and Duchess of Connaught, the Prince and Princess Christian, and the Princess Louise and the Marquis of Lorne. In the other window, the gift of Mr. Christopher Sykes, M.P., is the subject of the Crucifixion. These windows were designed and executed by Messrs. Heaton, Butler, & Bayne, under the supervision of Mr. Blomfield.

*Wolverhampton.*—A small stained glass window has just been placed in St. James's Church, Horseley-fields, in the above-named town, in memory of the late Mr. Henry Rogers. The window has been provided out of the fund raised last year, and by the aid of which a window has already been placed in the church at Heath Town, and a portrait of the deceased gentleman hung upon a wall of the Board-room in the Wolverhampton and Staffordshire Hospital. The window that has just been placed in St. James's Church is the work of Mr. S. Evans, of West Smithwick, the same artist who supplied the window for the Heath Town Church. The subject illustrated on the window is that of Christ blessing little children.

## NEW PUBLIC BATHS FOR WIGAN.

On Whit-Monday the Mayor of Wigan (Mr. Alderman Hopwood) opened the new public baths for the borough, which have been erected by the corporation on land in Millgate, adjoining the Free Public Library. To the late Mrs. Knowles, the wife of Mr. Thos. Knowles, M.P., must be given the credit for really investing the movement for establishing baths in Wigan with life and vitality, for it was owing to a promise by that lady to contribute 1,000l. towards such an institution that the matter was taken up by the corporation. In 1879 the council adopted the Public Baths and Washhouses Act, and the following year, under a Local Act, obtained powers to borrow 10,000l. for the erection of public baths in Wigan. The site having been selected, the plans of Mr. George Heaton, architect, Wigan, were adopted, and on the 27th of October last the foundation-stone was laid by the then mayor (Mr. W. J. Lamb), in the absence through ill-health of Mr. Knowles. Mr. Knowles's son on the completion of the ceremony handed over to the mayor a cheque from his father for 1,000l., the amount promised during her lifetime by Mrs. Knowles. The building is a substantial structure of brick and stone. The gentlemen's first-class plunge-bath is 58 ft. by 22 ft., and the second-class male plunge-bath is 68 ft. by 26 ft. To the first-class plunge-bath there are twenty-two dressing-rooms, and to the second-class twenty-three. A special feature in the second-class bath is a spacious gallery running round three sides of the building, and there is also an additional bath for those who require a special wash before entering the principal one. There is a separate entrance to the ladies' department, which comprise a plunge-bath, 23 ft. by 16 ft., dressing-room, and usual fittings. Besides the ladies' and gentlemen's baths there is a laundry, 20 ft. by 14 ft., with airing or "sweetening" place on the flat roof; drying-room, boiler-house, manager's residence, &c. The whole of the engineers' work, heating arrangements, boilers, &c., were supplied by Messrs. Thomas Bradford & Co., who also supplied the laundry machinery. The contractor has been Mr. W. Winnard, of Wigan, and the total cost, including the site, will be about 8,000l.

## HOLYWELL.

THERE are some points about the holy well of St. Clement that do not seem quite clear.

You describe the ancient fountain as finding a course to the Thames. The stream would not, perhaps, be large, but may have served considerably to swell that body of water that has given name to Millford-lane, and which, in chief part, would naturally flow from the higher ground of Lincoln's Inn-fields, described as an original swamp. There is no river name found in the streets about here but Mill-ford, which was probably at the head of a creek that gave the Danish pirates access to their horse-shoe camp in St. Clement Dances, west of London and posted directly in a main line of road for Silchester, Salisbury, Bath, and South Wales. A. H.

## LOCAL BOARD ARCHITECTS.

SIR,—I read a few lines on the above in your edition of the 3rd inst. I quite agree with the writer. I have been working up a practice for many years in a rough but thriving district, but since certain parts thereof have been put under Local Boards and part under rural sanitary authority, with their surveyors, or architects, or civil engineers, I find the business has been nearly destroyed, and no one appears to know who does the plans, &c. except that they are submitted, and, of course, passed.

The fact is, the surveyors, in some cases, are not to practise on their own account; but I know, from one of my own clients ("a brewer," who does not want to get a cross with the surveyor), that he obtained some of my work last year—it was not much, certainly.

I do not see how it is to be remedied, either. Say that a man is appointed surveyor to a Board, and he stays two or three years or more. Well, he forms a connexion, and works very cheaply whilst under "Board pay," and for some cause he leaves them, and starts for himself; this being repeated at intervals. I find, perhaps, four or five architects, civil engineers, &c., floated in the district in which I have struggled so hard. Perhaps some one else may have experienced this. ARCHITECT.

## LAW REFORMS.

*Public Legal Departments attached to every Civil and Criminal Court in the United Kingdom; Public Legal Advisers and Public Legal Professional Assistants affording to the Public Cheap, Sound, and Speedy Legal Assistance.*

SIR,—In face of the incomprehensible and even shameful state of our existing law and procedure, and the almost necessarily unlimited immunity, leave, and licence of, in fact, all classes of lawyers, Parliament, with adequate agitation, can hardly long refuse that legislation which should liberate and, so to speak, emancipate, the industrious classes of this country from this national feudal badge of legal servitude, and from the intolerable annual legal tribute and tax to justice, social peace and harmony, individual prosperity, and present and future security of property, nor refuse Parliamentary inquiry and reform in regard to the practice, procedure, legal usages, fees, and charges both of the barristers' chambers and of the solicitors' offices. In county courts, for instance, the county court registrars, whose duties are easy and light, and could well be performed by clerks, could, without expense to the country, fulfil the positions of public legal advisers, and public legal professional assistants. With the writer's well-known scheme of public defenders, the public would thus entirely avoid all compulsory recourse to the legal profession, and, further, would become wholly insensible to the hopeless obscurity and ruinous costliness of our existing law and practice.

AUGUSTUS T. HARVEY.

## JERRY BUILDERS AT WIMBLEDON.

The Wimbledon Local Board have recently taken vigorous action with a view to putting a stop to the scandalous manner in which some builders have been carrying on their operations in that parish.

A builder recently commenced to build three shops, but the concrete under the footings was of such a wretched description, while the mortar in the walls was principally mud, that the Surveyor, Mr. W. Santo Crisp, served him with a notice to amend; this was disregarded, and the builder proceeded until he was peremptorily stopped from going on further. At that time the walls were as much as 4 in. out of perpendicular, and subsequent measurements showed that the walls were every day getting worse; the Surveyor therefore reported the buildings as being "dangerous structures," and action was taken by the Board under the 75th clause of the Towns Improvement Clauses Act, 1847, Mr. Robt. Walker, Surveyor, St. Martin's District, supporting the Board in their application at Wandsworth Police-court, for an order to "pull down." The order being granted, the Board, after the lapse of the specified time, razed the buildings to the ground.

It is hoped by vigorous action to stop the spoliation of one of the most lovely of the London suburbs by improper building.

**The Union of Benefices Bill.**—The Union of Benefices Bill was read a third time in the House of Lords on Tuesday evening and passed. We have already given a *résumé* of its provisions.



### NEW INFANT SCHOOLS, BANSTEAD-ROAD, SUTTON, SURREY.

THESE schools, the memorial stone of which was laid on the 6th inst., are now in course of erection on a finely-undulating piece of land, consisting of 20 acres, situate on the road from Sutton to Epsom, and close upon Banstead Downs. The buildings are intended to be supplementary to the South Metropolitan District Schools, which are situate nearly opposite to Belmont Station on the branch line of railway from Sutton to Epsom Downs. They will accommodate, including the officials, about 2,000 persons. The schools are of the industrial kind, and receive children from the workhouses of the Greenwich Union, St. Olave's Union, Stepney Union, Woolwich Union, and Camberwell Parish.

The managers of these schools, finding them insufficient to accommodate the increasing number of children, in the exercise of a wise discretion determined on the erection of new schools where the infants will be trained until they are of a sufficient age to be drafted into the schools already built there, to receive instruction in the ordinary rudiments of education, and be also taught some useful trades or occupations, so that they may be enabled to obtain their own living.

The land is surrounded with an oak park-pale fence, 7 ft. in height, having two entrance-gates opening on to the Banstead-road. Near the northern gate is situate the probationary ward, where the children are placed for a certain period previously to their admission to the Homes. These Homes are calculated to accommodate 500 children, in six separate blocks of buildings, with separate laundries and other offices, and the necessary nurses and attendants. The centre building, near the Banstead-road, is the administrative block, for the accommodation of those officials who have the general supervision of the whole establishment; at the rear of this block, and at the distance of about 100 yards, is placed the general hall, in which the children and officials will assemble for Divine worship, examinations, or entertainments. Beyond this, on a rising slope on the eastern side of a slight valley, are situate the infirmary block, and again a little to the rear of this will be placed the infectious ward.

It is intended that the whole of the sewage shall be utilised upon the agricultural portion of the land, which, being of a light description upon a subsoil of chalk, will take all the sewage that may possibly arise from the buildings.

The arrangements for laying the memorial-stone were made by Mr. B. J. Pyie, the manager of the contractors, and Mr. Wm. Lawrance, the clerk of the works.

The architect is Mr. Wm. Wallen, of College-street, and the contractors are Messrs. Kirk & Randall.

### THE METROPOLIS MANAGEMENT AND BUILDING ACTS AMENDMENT BILL.

#### GATES AND BARS IN THE METROPOLIS.

THE House of Lords on Tuesday went into committee on the Metropolis Management and Building Acts Amendment Bill.

Clauses 1 to 5 were agreed to.

On Clause 6,

The Earl of Milltown complained that the Bill did not authorise the Board of Works to deal with the bars, gates, and other obstructions existing in certain parts of London, and especially in Pimlico and Bloomsbury, in which latter district they were peculiarly inconvenient. In Gordon-street, Euston-square, the notice affixed to the gate was to the effect that, by permission of the Duke of Bedford, and during his Grace's pleasure, carriages and cabs might pass through within certain hours, but no wagons or other heavy vehicles were allowed without special permission. The date was July, 1835. Now that, he submitted, was not a notice that ought to be put up in a London street in the last quarter of the nineteenth century. Its terms gave one the idea that there was nothing to prevent the Duke of Bedford from closing the street altogether if he chose to do so. The restriction might have been right and proper originally, when the Bedford estate was on the outskirts of London, but now that a large part of the metropolis lay north of the New-road the bars and gates caused great inconvenience, and their maintenance was an extreme instance of the assertion of the rights of pro-

perty. He moved an amendment giving the Board of Works power to remove these obstructions.

Lord Thurlow opposed the amendment on the ground that it involved a number of questions and opened the door to a great variety of claims which the Board was not at present prepared to consider. It was to be remembered that in the case of ordinary obstructions the Board had power to proceed by way of indictment. The object of the clause was to prevent any one who had opened a street with the consent of the Board from closing it again without their sanction.

The amendment was then withdrawn and the Bill passed through Committee.

### WASHABLE WALLS.

I SHALL be glad to know of some inexpensive washable decoration (not paper) for walls of institutions such as hospitals.

Is there any distemper which is really washable, or paint, which will not cost more than 6d. per yard, to cover on newly-prepared surface and is yet durable?  
W. H. S. S.

### STARTING FORCE ON TRAMWAYS.

SIR,—Your recent article on "Steam Power or Electric Power for Tramways" contains the following remarks:—

"It is well known to be the fact that it is the strain of starting the cars that most tries the horses, and that, in fact, makes the horse-power so costly. We venture to anticipate that the most successful mode of tramway working, which at the present time is attainable, is the use of horse-traction, supplemented by a starting force to be supplied by an accumulator, which might also receive the force otherwise wasted in stopping."

It may surprise you to learn that exactly such an accumulator as you describe is an accomplished fact.

A few days ago I was present at a private trial of the experimental machine constructed by Messrs. S. Best & Co., engineers, 25, Hickman's Folly, Rotherhithe. For a first examination by independent practical men, generally so trying to new inventions, it was remarkably successful. No theoretical error was detected. Some trifling alteration in the arrangement of the details alone was suggested as necessary to make the accumulator a most efficient starter for tramway-cars from a state of rest.

The mechanism was fixed to full-sized car-frame (i.e., having no body) for convenience of access. This frame had the usual tram-car wheels, axles, and bearings, and was built by Messrs. Starbuck & Co. It was set smartly in motion when the hydraulic accumulator (such is its name) was brought into play by a simple lever movement, bringing the car to a state of rest in from 10 ft. to 15 ft. by accumulating the momentum ordinarily dissipated by the friction-brake, and storing it up ready to be used for restarting.

On reversing the action of the lever, the machine is ready to propel the car onward, on opening a cock, requiring but a few pounds pull, which can be done either by the horses or by the driver, if he thinks them nervous, when an effective propulsive power of 1,500 to 2,500 lb. is developed, ample to set a fully-laden car in lively motion.

A peculiar feature of this apparatus is an hydraulic cylinder and oil reservoir, with an inlet opening valve, and an opening and shutting cock, whose action smoothly, yet effectually, checks the return of the accumulator springs, until required to be liberated on restarting the car.

The action is simple and effective, and as the machine gives out the same amount of propulsive force as was required to stop the car, minus friction, it is obvious that it is equally adapted for either light or heavy loads; it works from both ends of a car, and is equally effective in either direction. It is so easily controlled, that a child might stop or start a car. Its weight will be under 2 cwt. A case to protect the working parts from dust forms part of the arrangement.

I believe the machine will prove a great boon to tramway companies, as it will relieve the wear and tear of horse power equivalent to three to five miles per diem.

In its present form, fixed only to the frame of a car, it is only suitable for examination by professional men; but the inventor, an experienced tramway administrator, informs me that a number of accumulators are now being

manufactured, so that in the course of two or three weeks we may expect to see them fairly tested on ordinary cars actually at work, carrying passengers on some of the London tramways.

Wm. H. LE FEVRE, C.E.

### REVIEWS OF REVIEWS.

THE author of a book on "Joints," reviewed in our number for May 20, considers we have not presented a correct view of his work, and calls upon us to insert his own explanations. This we decline to do, and he threatens us with the terrors of the law. He must take his own course in this respect. It should be obvious that if we allowed every author, who thought his book had not been read with sufficient care by the reviewer, to supply what he considered deficiencies in the notice, we should have to further enlarge our journal without affording any great advantages to its readers.

### CHURCH-BUILDING NEWS.

**Port St. Mary (Isle of Man).**—The foundation stone of this church (of which we lately gave a short notice) was laid on the 15th ult., by Mrs. Gawn. The Lord Bishop of Sodor and Man was present, also the Rev. F. F. Tracy, M.A., the vicar, and many of the clergy of the island. The Vicar conducted the service, after which the Bishop gave an address. Messrs. T. D. Barry & Son, of Liverpool, are the architects.

**Millbrook.**—The new church at Millbrook, Hants, is now completed, and the spire, upwards of 150 ft. in height, can be plainly seen for many miles surmounted by a gilt cross and weather vane. The tower rises to a height of 60 ft., and is built of Swanage stone to correspond with the church. The walls are 4 ft. 3 in. thick, and are lined internally with hard red bricks from the Chandler's Ford yards of the contractor. The quoins, buttresses, and dressing to the ringers' loft, bell-loft, &c., are of red bed Farleigh Down stone from the celebrated quarries of Messrs. Randell, Saunders, & Co. In the bell-loft are fixed four massive English oak beams to carry the bells; these are supported upon heavy granite corbels. The spire is built of red Farleigh Down stone, also lined to a height of 25 ft. with bricks as before; above that height it is entirely built of Farleigh Down stone. The architect is Mr. Henry Woodyer, of Guildford. The contractor was Mr. John Crook, of Northam, Southampton, and the clerk of the works was Mr. Vennell.

**Bristol.**—The new Church of St. Saviour, Woolcott Park, Redland, was consecrated on the 30th ult. by the Bishop of Gloucester and Bristol. For some years the congregation have worshipped in an iron church, which stands upon a site adjacent to the spot where the new church is erected; but an effort was made some time since to raise funds to build a larger and more comfortable place of worship, and Mr. John Bevan, architect, Bristol, was commissioned to prepare plans for the new church. The contract of Messrs. Cowlin & Son was accepted to execute the work. Externally, at the west end, and springing from the gable, is a lofty bell-turret, with a canopied niche at the apex, containing a figure of our Lord as the Good Shepherd. The style adopted is Early French Gothic, of a massive type. The principal entrance is through a narthex at the west end. Upon the plan the church consists of nave, north and south aisles, organ-chamber, clergy and choir vestries on the north side, and on the south side a transept. From wall to wall the width of the nave, with north aisle, but exclusive of the south aisle, yet to be built, is 41 ft., and the length 93 ft.; from the floor to the apex of the roof, 58 ft. The chancel is 38 ft. long by 25 ft. wide, and 52 ft. high, having on the south side sedilia, piscina, and credence-table; and on the north side an ambury or locker. The nave is divided from the aisles on either side by an arcade of six bays. The chancel arch is 20 ft. wide and 38 ft. high to the point of the arch. The nave and aisle roofs are open-timbered, plastered between the rafters; and the chancel and organ-chamber roofs boarded with moulded ribs dividing them into bays and panels. The whole of the roof timbers are left without stain or varnish upon them, with the hope (at no distant date) of their being stencilled with colour. Some of the windows are filled with cathedral glass, of pale tints, in geometrical pattern, by Mr. Ben Gay.



The heating of the church is by means of hot water, circulating at low pressure, this portion of the work having been carried out by Mr. Vincent Skinner. The carving, so far as it has gone, was executed by Mr. Sheppard, and reflects great credit upon him. The total cost will be about 5,000l.

**Gloucester.**—On the 1st inst. a vestry meeting of the parishioners of St. Michael's, Gloucester, was held to consider certain contemplated alterations in the chancel and other parts of the church. It was announced that a lady, who did not wish her name to be published at present, was desirous of erecting a memorial in the church to commemorate her father and mother, who were buried there. She expressed a desire to erect a reredos, and was prepared to contribute a sum not exceeding 1,000l. Mr. Waller, architect, had been consulted as to the proposal, and had made a report upon it, accompanied with drawings, which were handed round to the meeting. He recommended that, instead of the whole of the money being expended upon a reredos, a portion of it should be devoted to preparing the chancel to receive the costly and beautiful addition,—that the whole of the chancel and reredos should become the memorial to the family the lady wished to honour, in a similar way to that in which the Lady Chapel in the Cathedral had once been treated, and also the Marling Memorial Chapel; that the chancel be separated from the nave in the most emphatic manner, and be made the most important and distinct part of the edifice. This he proposed to effect by making the timbers of the roof of greater importance, and carrying down marble shafts; by boarding in the whole of the underside of the ceiling of the chancel, the ribs being moulded with floral bosses, and decorated with colour, or, if preferred, of different kinds of wood. He further proposed that a stone screen should be placed across the last arch of the chancel, and that the reredos should be made of white Caen stone, with figures of alabaster. The design suggested by Mr. Waller has, it appears, been greatly approved by the donor. It was resolved to apply for a faculty for the erection of the proposed reredos and sedilia in the chancel, and for other improvements, in accordance with the proposals submitted by Mr. Waller.

**Elstow (Bedfordshire).**—This church is being improved, under the care of the new rector. A new reredos is erected in the style of architecture of the chancel and other architectural features, such as the arches and decorated monuments adjoining. The reredos occupies the width of the chancel, the central portion being the width of the east window and divided into three compartments by marble columns, carved capitals, and moulded and sunk buttresses, finishing with carved pinnacles, &c. The central compartment contains a white alabaster cross and marble background, and on either side, in the other two niches, are figures of St. John and the Virgin Mary, the church being dedicated to St. Mary. These statues have canopied cusped tracery over, with carved gable crockets deeply moulded with a rich marble background, and supported by a corbelled super-altar of marble. On either side of the central portion, forming the reredos proper, is an arcade of four arches with carved panels and moulded cusped arches supported on marble columns and carved capitals forming panels, containing the Commandments, Lord's Prayer, and Belief, cut and painted in red and black, giving a very good effect from the nave of the church. The whole of the work has been carried out by the instructions of the rector, the Honourable and Rev. E. T. St. John, by Mr. R. L. Boulton, ecclesiastical sculptor, Cheltenham.

**Bexley (Kent).**—A second new church for the parish of Bexley, Kent, was consecrated by the Archbishop of Canterbury on Saturday afternoon last. His Grace, accompanied by his Chaplain and Registrar, was received at the building by the Archdeacon of Maidstone, the rural dean, and clergy of the adjoining parishes. Among the distinguished company present were the Earl of Sydney, K.G., Lord Lieutenant of the County, Sir C. H. Mills, M.P. for the Western division of the county, and the Rev. H. Scott Holland, of Christ Church (Senior Proctor), representing the University of Oxford, besides a large number of resident gentlemen. The new building has been carried out by the contractors, Messrs. Naylor & Son, of Rochester, from the designs and under the superintendence of Mr. George Low, of 10, Basinghall-street, and is built of Kentish rag, with Bath stone

dressings and tiled roofs, and consists of nave with north and south aisle, entrance porch, chancel and vestry; the tower and spire are not yet erected for want of funds, but it is hoped the Committee will soon be enabled to proceed with these and complete the building.

#### DISSENTING CHURCH-BUILDING NEWS.

**Lower Norwood.**—On the 16th ult. the new Baptist Chapel, erected by Messrs. J. Smith & Sons, of South Norwood, from designs by Mr. Hampden W. Pratt, in the Gipsy-road, Lower Norwood, was formally opened. The building had to be adapted to a somewhat awkward site, which necessitated very careful planning in order to provide the accommodation required. Entering by two doorways on either side of the front, a descent of a few steps leads to a spacious room, which will be used for lectures and entertainments. It is provided with a platform, and is capable of seating 550 persons. The principal entrance to the chapel is approached by broad steps executed in "Granolithic," a substitute for stone, which has also been used for all the staircases in the building. The doors open on to a large vestibule, paved with tessellated tiles, and divided into a series of lobbies with swing doors, so as to exclude draughts as far as possible. The interior of the chapel has a bright and cheerful appearance, the windows being glazed with tinted glass, and the plaster on the walls finished a light red colour. The roof is open-timbered, and boarded in panels. The chapel has on three sides a gallery. The chapel is capable of accommodating about 740 persons. The preaching rostrum stands in an arched recess, lighted by a wheel-window, and there is a large circular-roofed lower platform, in which is placed the baptistery, made of enamelled white slate. In the rear are vestries for the pastor, deacons, and ladies respectively, and below there is a large class-room, also a kitchen provided with every convenience for tea-making purposes. The exterior of the building is executed in Kentish rag, with Bath stone dressings. The style adopted is Gothic of the Early English period. The cost of the building has been about 4,500l.

**Newcastle-on-Tyne.**—The new buildings for the Congregational church and school at Heaton form an important addition to the architectural features of the district, and, as they occupy a prominent site, with ample surrounding space, can be well seen. The style of architecture adopted is Early English, and the general arrangement of the interior is somewhat more ecclesiastical in its character than is usual in such buildings. All the congregation are seated upon the ground-floor, in nave and transepts, and the only gallery accommodation is a small end gallery for the choir. There are double transepts upon each side of the nave, divided from the latter by stone arches and columns. The windows are fitted with geometrical tracery and filled with cathedral glass in lead panes. Behind the church is the school-room and vestry, with the usual adjuncts. The entire structure is carried out in stone, and the buildings are well heated and ventilated, the heating being effected by means of hot water, and vertical inlet tubes, or what is known as the "Tobin" system, being adopted for the latter. The total accommodation in the church is 520 sittings. The school-room measures 48 ft. 6 in. by 22 ft., and in addition there are vestry, heating-cellar, and other conveniences. The total cost has been about 2,200l., or, including land, architect's commission, and paving and flagging, 2,900l. The architects were Messrs. Oliver & Leeson, of Newcastle.

**Dunfermline.**—The members of the Baptist Church in Dunfermline have decided to erect a new place of worship in Viewfield-place. Plans have been prepared by Mr. Henderson, architect, Edinburgh, and the style of architecture adopted is Gothic, of the twelfth or thirteenth century. Accommodation is to be provided for 600 people. The plan of the chapel is nearly a square of about 46 ft. inside, the side opposite the pulpit being semicircular, with four rows of raised seats all round. The gallery also follows this line. The roof is cruciform, finishing in four gables. A hall to hold 200 people is also to be erected. The estimated cost is 3,000l.

**Hamilton (N.B.).**—The new church erected for the Hamilton West Free Congregation, on the site of their former place of worship at the junction of Clydesdale-street and Burnbank-road, has just been opened by Principal Rainy, of

Edinburgh. The new church is in the style of the fourteenth-century Gothic, cruciform in shape, with tower and spire about 100 ft. high, and seated for 650 persons. The architect is Mr. J. Hutchison, I.A., Glasgow, and the total cost is about 4,000l.

**Leicester.**—On the 30th ult. the ceremony of laying the foundation stone of the new Primitive Methodist Chapel in the Belgrave-gate was performed by the mayor (Alderman Chambers), Mr. A. McArthur, M.P., and thirteen of the friends of the chapel. The new chapel, of which Mr. A. Burgess is the architect, is to take the place of the Great George-street Chapel, which was built and opened in 1819, at a cost of 1,500l. Large schools were subsequently erected on a site adjoining the chapel at a cost of 1,277l. The site for the new chapel was purchased in 1881, and cost about 3,280l. About fifty yards fronting Navigation-street have been sold to the Corporation for the purpose of widening that narrow thoroughfare. The new chapel will be 79 ft. in length by 45 ft. in breadth, and will seat 900 adults. The school-room, consisting of a large hall and several class-rooms and vestries leading out of it, will hold 1,000 children. The contract for the building has been taken by Messrs. W. & A. Rudkin, at 4,754l. 14s. 2d.

**Ossett.**—The new Congregational Church here, of which the first stone has been laid, takes the place of the old chapel which was rebuilt about thirty years ago. The new building comprises six lofty class-rooms on the basement story, which is about on a level with the front road at the lowest corner, and over this story is the church, reached by three easy flights of steps in front, whilst it is entered on the level of the ground at the back, the road at the east side having a considerable incline. The church comprises nave, aisles, transepts, and choir, and is 93 ft. long, 50 ft. wide across nave, and 66 ft. wide across transepts, the aisles and transepts being divided from the nave by arcades of cast-iron pillars, carrying moulded wood arches; from the cornice over this arcade is a wagon-headed roof. The church will seat 1,008 adults, allowing 20 in. for each, in seats 2 ft. 9 in. wide, so that, with the usual proportion of children, about 1,200 persons can be accommodated if required.

Externally, the architect has relied on grouping rather than on elaborate detail for the effect of the building. The front towards the street has a lofty gable rising to the height of 70 ft. above the level of the road. The principal flight of steps will hide the basement door, but at the top of the steps is a spacious doorway, with pillars having moulded bases and carved capitals supporting moulded arches; this centre doorway, which is in a projecting portal, is surmounted by a gable ornamented with carved crockets and finials, and over it are five lancet windows with shafts, carved caps, &c., comprised in a large and lofty arch occupying most of the gable. At the right-hand corner of the church is a tower, surmounted by a spire, rising to a height of 122 ft. from the level of the road. At the side of the tower, and also at the opposite corner of the front, are semi-octagonal projections, which contain the staircases. On the ground-floor stage of the tower, and on the opposite vestibule, are doorways corresponding with the central doorway, except that they are not surmounted by gables. The sides of the church are relieved by transepts, which project about 8 ft., and have double gables, which break the line of roof. The building will be faced with self-bedded or delf stone from Northowram, all the dressings being of best ashlar. The roofs are to be covered with dark Westmoreland slates. The warming is to be by hot water, and the ventilation by Boyle's air-pump ventilator. J. P. Priestcott, architect. Darlington, and the work is being superintended by his son, who acts as clerk of works. The work is let to the following contractors:—Masons' work, Messrs. James Booth & Sons, Batley; slaters' work, Messrs. Pycock & Sons, Leeds; plasterer's work and painter's work, Mr. Henry Sanderson, Ossett; joiners' work, Messrs. Horsnell & Heald, Ossett; plumbers' work, Messrs. Heyworth & Spurr, Ossett; iron-founders' work, Messrs. Taylor & Parsons, Bradford; heating apparatus, Messrs. Weeks & Co., London. The total cost is about 5,500l.

**Sunderland.**—The new Congregational school-chapel, Chester-road, was opened on the 6th inst. This forms a portion of the scheme which has been previously referred to in our pages. Messrs. Hirst & Sons, the contractors, com-



menaced operations on January 23rd, and the favourable weather which has been experienced has enabled them to finish the building (which has cost about 1,600*l.*) in a little over four months. The whole of the works have been carried out from the design and under the superintendence of Mr. H. T. Gradon, architect, Durham.

**Hollin.**—On Saturday, the 3rd inst., three memorial-stones were laid in a new chapel and school at Hollin, near Newchurch in (connexion with the Bacup Circuit of the United Methodist Free Churches). The architects are Messrs. Maxwell, Tuke, & Hurst, of Southport.

#### SCHOOL-BUILDING NEWS.

**Bolton.**—In order to meet the spiritual wants of the large increase of population in the neighbourhood of Gaskell-street, Snowdon-street, and John Brown-street, Bolton, it has been decided that a new school and mission-room in connexion with the parish of St. George be forthwith erected, such school to be known as "The Neville Jones Jubilee Memorial School," the Rev. Neville Jones having attained the jubilee of his ministry in the church (being ordained in the year 1832), thirty-five years of this period being spent as vicar of St. George's parish. The cost of the school will be about 2,000*l.* The plans for the new school, which have been prepared by Mr. Morris, architect, Bolton, show a two-story building in the Gothic style. The ground-floor contains one large room to be used as a boys' Sunday school, 48 ft. by 28 ft.; and a class-room adjoining, 22 ft. by 17 ft. Proceeding up a wide staircase, a large room is entered 48 ft. by 28 ft. This will be used as a girls' Sunday school, and will have a class-room adjoining 22 ft. by 17 ft.

**Bristol.**—St. Agnes's School, Newfoundland-gardens, has been opened. It is Gothic in style, the exterior being of very pleasing design and well thought out. The materials of which it is constructed are local Pennant stone, the dressings being of freestone. The building is 40 ft. in height, and the main room measures 70 ft. by 30 ft. This apartment will seat 350 people, or, on occasion, even 400. There are two class-rooms for the various works proposed to be carried on, a soup-kitchen, lavatories, &c. The completed design contemplates the addition of another room about half the size of the large room, but the funds are not forthcoming. The architect is Mr. C. F. Hansom. Messrs. W. Cowlin & Son, of Bristol, were the builders. The structure, which has cost a little over 1,900*l.*, was in progress only five months, having been commenced in January last. Messrs. Tuckey & Son, plumbers, and Messrs. Jones & Hudson, gasfitters, were the sub-contractors; and Mr. J. Perrott filled the office of clerk of the works.

#### VARIORUM.

The "Lectures on Art," delivered in support of the Society for Protection of Ancient Buildings, are about to be published by Macmillan & Co. The volume will include:—Regd. Stuart Poole, "Egyptian Tombs and the Future State;" Professor W. B. Richmond, "Monumental Painting;" E. J. Poynter, R.A., "Decorative Art;" J. T. Micklethwaite, "English Parish Churches;" and William Morris, "The History of Pattern Designing and the Lesser Arts of Life."

#### Miscellaneous.

**New Police Court, Bangor.**—In place of the old court, which has for many years stood in High-street, Bangor now possesses a police building suited to its requirements. The building, which is situated in the Garth-road, rather more than half a mile from the railway station, has been erected from the plans of Mr. John Thomas, the county surveyor. Mr. Evan Jones (Grosvenor) was the contractor. The site is one exchanged by Lord Penrhyn, his lordship having contributed 150*l.* towards the extra cost of the building, which has cost 2,800*l.* The style is Domestic Gothic, the external materials being Pennanmaur stone, with Hudson dressings and roofing, and Penrhyn slates. The magistrates' court measures 41 ft. by 21 ft., and will be suitably fitted up by Messrs. Pierce & Williams, Carnarvon. The new building was formally opened on Tuesday last, the 13th inst.

**Harbour Improvements at Table Bay.**—The Table Bay Harbour improvements, commenced in 1860, appear to be among the most successful of the public works carried out by the colony. The productiveness of the colony has so increased in the last twelve years as to render the "calling trade" a matter of significance; and with the material progress of the country the commerce of the port has year by year steadily grown, until last year the tonnage of vessels entering Table Bay was four and a half times greater than it was in 1869. The gross revenue of the Harbour Commission is at the rate of 7,000*l.* per month, and of the total expenditure on the works, amounting in round numbers to one million sterling, more than half has been paid out of the earnings of the undertaking. Encouraged by their success, the Commissioners have carried out, at the expense of 130,000*l.*, a new graving dock, now finished, where steamers of 500 ft. long, of any tonnage up to 4,000 tons, and drawing 23 ft. of water, can be accommodated for the purposes of overhaul and repair. In consequence of the increase of shipping it has also lately been necessary to get the engineer-in-chief, Sir John Coode, to prepare plans for the further extension of the works. The breakwater is to be lengthened 1,800 ft., and arms are to be run out on either side inclosing a large area of deep water, which will form a new outer harbour.

**Lift, New County Hotel, Newcastle-on-Tyne.**—In this building, which is approaching completion, Messrs. Clark, Bunnett, & Co., of London, have just fitted up a hydraulic passenger lift. It is arranged to travel a distance of 60 ft., and the cage, or carriage, will contain three passengers, together with an attendant. Every contrivance to prevent accident has been adopted. In the event of the chain snapping, from any cause, by an ingenious arrangement the weight of the carriage will fall upon springs fixed at the top, which immediately spread out and catch into slots prepared in the guides. The doors of the cage are also managed so that they will not open unless the carriage is opposite the landing. Communication is obtained with the attendant by means of electric bells, and at each landing there is an indicator showing where the carriage is. The arrangement for regulating the movement of the carriage is simple. There are placed inside the carriage three brass knobs, marked Nos. 1, 2, and 3, corresponding with the number of landings at which the carriage will stop. All the attendant has to do is to push in the knob containing the number corresponding with the landing at which he wants the carriage to stop.

**Dangerous Structures not "Nuisances."**—At the Wandsworth Police Court, on Tuesday, a Mr. Aubrey was summoned in respect of 26, 28, 30, and 32, Sleaford-street, Battersea, which were alleged to be in such a state as to be uninhabitable. Mr. Corbellis, Clerk of the Wandsworth Board of Works, attended to support the summons, and said that if the defendant would clear out the tenants and put the houses in repair an adjournment would be consented to. The defendant did not agree to that proposition, though he stated that the work was in hand. Mr. Pidditch, the Board's surveyor, gave a description of the houses. The floors, staircases, and plaster had given way, and there were props in the rear to prevent the back walls from falling out. Mr. Shell wished to know what special nuisance was complained of. Mr. Corbellis said the houses were not weather tight. Mr. Shell said he could not make an order, as the word "nuisance" was used in the Act. The summons should have been taken out for a dangerous structure. The summons was dismissed.

**The President of the Institute.**—Mr. Horace Jones entertained the Council of the Royal Institute of British Architects at dinner at Limmer's Hotel, Conduit-street, on Thursday, the 8th, and invited a number of eminent friends to meet them. The speeches were very few, but to the purpose. The President, in a few well-chosen sentences, proposed "Prosperity to the Institute," and the Right Hon. the Lord Mayor, Sir J. Whitaker Ellis, drank the health of the host, and spoke in complimentary terms of what he had done in the City, referring particularly to the improvements at the Guildhall and the design of the City Library. A very agreeable evening was spent.

**Notice of Removal.**—Messrs. Treggon & Co. (Limited), zinc and galvanised iron merchants, give notice of removal from their old warehouse, No. 23, Jewin-street, to more commodious premises at No. 19, in the same street.

**Value of Land in the City.**—On Wednesday, in the Lord Mayor's Court, an important compensation case was concluded. The plaintiff was Mr. Adrian Elias Hope, the owner of the premises Nos. 3, 4, and 5, Cloak-lane, City, who sought to recover £55,000 from the Metropolitan and Metropolitan District Railway Companies, who require the property under the compulsory powers of their Act for the completion of the inner-circle scheme. Mr. Webster, Q.C., and Mr. Biron were counsel for the claimant; Mr. Matthews, Q.C., and Mr. Beresford for the defendant companies. On the part of the plaintiff evidence was given to show that in 1879 he purchased the property in question, as a matter of investment, for the sum of £45,000, his intention being to convert it into City offices, warehouses, and cellars of a first-class character. A great many surveyors and valuers of eminence were called who valued the property at £53,000. On the part of the defendants, it was suggested that the claimant had given a fancy price for the property in anticipation of its being required by the companies, but this was denied. Professional evidence, called on the part of the defendants, put the value of the property at £33,770. The jury ultimately returned a verdict for the claimant for £41,517.

**The Alleged Discovery of Organic Remains in Meteorites.**—It is asserted that Dr. D. Weinland has been able to verify the alleged discovery, announced a year ago by Dr. O. Hahn, of Berlin, of organic remains in meteorites (and upon which alleged discovery we commented at the time). Dr. Hahn's discovery (says the *Standard*), when first published, appeared so wildly improbable that, like many other important discoveries, it excited merely incredulous amusement, and dropped at once into the limbo of forgotten things. And yet Hahn's researches extended over no fewer than 600 specimens of meteorites of the Chondritic class in the museums of Tübingen and Vienna, all these meteorites having been proved to be genuine. In the body of these specimens he found a quantity of organic remains, principally belonging to the most ancient form of porous corallines, and including no fewer than fifty varieties of these creatures. Dr. Weinland has, we are now told, after a year's patient microscopic investigation, satisfied himself of the entire correctness of Dr. Hahn's observations.

**The Society of Arts' Conversazione.**—The South Kensington Museum was on Wednesday evening devoted to the annual *conversazione* of the Society of Arts. The North Court and Lord President's Court, with the galleries brilliantly illuminated with the electric light, furnished excellent promenades, where the visitors intermingled in opposing streams, where movement was possible, to the strains of the Hungarian band and the band of the 1st Life Guards. Various entertainments were provided for the guests, who were received in the Architectural Court by Sir Frederic Bramwell, Chairman of the Council. Nearly three thousand persons were present.

**The Royal Church at Kew.**—The Queen has promised a subscription of £100 towards the fund for the enlargement of the Royal Church at Kew. It is proposed to increase the accommodation to 737 sittings, and in every way to improve the church. The scheme has been unanimously approved at a public meeting of the inhabitants of Kew, presided over by the Duke of Cambridge, who has also subscribed £100. The subscription list further includes the names of the Duchess of Teck, and the Grand Duke and Duchess of Mecklenburg-Strelitz. The work, it is estimated, will cost £5,500.

**Kensington House.**—Messrs. Fuller, Horsey, Son, & Cassell, of Billiter-square, have issued the catalogue of the valuable materials and fittings of this recently-erected mansion, which are to be sold by them, on the premises, on Tuesday next and following days. It is well worthy of perusal.

**Borough Surveyorship of Blackburn.**—We are asked to state that the "Nuttall of Bury," whose name has appeared as a candidate for the appointment, is not Mr. Thos. Nuttall, of Broad-street, Bury.

**St. Jude's, Chelsea.**—Considerable alterations in the parochial schools here have recently been carried out by Mr. William Balcombe, from the plans and under the superintendence of Mr. E. H. Lingen Barker, architect.



**Chokage of Drain-pipes by Roots of Trees.**—At the last meeting of the Royal Botanic Society, the donations towards the Society's collection included a curious specimen of elm root, completely filling and choking a drain-pipe. Several examples of the same kind of growth preserved in the society's museum were on the table, and the secretary said the choking of drains in the vicinity of trees was often caused by a simple root entering the drain between a joint in the pipes; it then branched and ramified into a vast number of fibres, matted together as a mass of oakum, and completely filled the pipe. This action was not confined to any particular variety of tree, and often occurred at a much greater distance from the tree than the roots were generally supposed to extend. If drain-pipes were laid so as to fit each other properly, and well cemented together, the roots of the trees would not so often find their way into the joints as they do.

**Enormous Cost of Water in the City.**—The City Press, commenting upon the decision of the Court of Queen's Bench, that water can be charged for only on the net rateable value of a house, points out that the annual gross value of property in the City is £1,699,000. The rateable value is £3,531,000, being a difference of 638,000. As the water-rate is four per cent. upon a house not exceeding 200l. annual rental, and three per cent. upon houses exceeding that value, the average may be taken at three and a half per cent., and three and a half per cent. upon 638,000l., being over 22,000l., that represents the annual saving to the citizens of London, if this just decision be carried out. Some thirty years ago, when the New River Company obtained their last Act of Parliament, they contracted under its provisions to supply the City with water at an average of three and a half per cent. on its then annual value, which was somewhat about 1,300,000l. The water-rate, therefore, at that time, exclusive of extra charges for extra accommodation, was about 45,000l. per annum. Years have rolled on, and men have ceased to reside in the City, but let out their houses in floors to others who also do not reside in the City. The consequence is that the consumption of water is largely diminished, but instead of the charge for it being therefore diminished, as would be the logical result of such a state of things, if change there was to be, the company, taking advantage of the mere letter of their Act, utterly regardless of its spirit, actually claim the right to increase their charge for a diminished supply from 45,000l. per annum to 146,000l., that being three and a half per cent. on the present gross rental of the City.

**South Stockton Local Board.** On the 6th inst. an ordinary meeting of the Board was held. The subject of erecting a suite of public offices suitable for the use of the various Boards of the district had been under the consideration of the Plans and Works Committee since the last meeting of the Board. The Surveyor (Mr. S. E. Thorold), in accordance with instructions, prepared sketch plans of a building such as he thought would meet the requirements indicated. The building was designed to cover the site belong to the Board in George-street, and was estimated to cost 4,000l., which sum, the Surveyor pointed out, might be borrowed at four per cent., and its repayment spread over a period of fifty years. In the opinion of the Surveyor the offices might be expected to realise the following rentals:—Guardians' offices, 30l. per annum; Post-office, 40l.; Local Board, 35l.; School Board, 20l.; spare offices, 30l.; Fire Brigade, 18l.; and public hall, 50l.; making a total of 223l. per annum. As the requirement of the loan, with interest, over a period of fifty years would entail an annual payment of 206l. 4s. 2d., the Surveyor thought the scheme was one that would commend itself to the consideration of the Board. The Plans and Works Committee, having had the plan before them, resolved that, in the first instance, it would be advisable for the surveyor to have an interview with the engineer of the Tees Conservancy Commissioners relative to the subject of accommodating the Commissioners in the proposed new offices.

**The Rowland Hill Statue.** In Cornhill, near the Royal Exchange, will be unveiled this Saturday evening, the 17th, by H.R.H. the Prince of Wales.

**The Council of the Over Darwen Corporation** have increased the salary of Mr. W. Stubbs, borough surveyor, from 275l. to 350l. per annum.

**New Municipal Buildings, Great Yarmouth.**—The hot-water heating apparatus throughout the building, and the cooking apparatus, hot-plates, steam-closets, &c., for the kitchens, were manufactured and supplied by Messrs. Barnard, Bishop, & Barnards.

## TENDERS

For alterations and additions at the Atwell Arms, Atwell-road, Peckham, for Messrs. Watney & Co. Mr. C. W. Bovis, architect:—

J. B. Axford	£1,457 0 0
Heraldine	1,242 0 0
Smith	1,197 0 0
J. Anley	1,170 0 0
Hans Scharien	1,145 0 0
Spencer & Co.	1,127 0 0

For detached villa residence, at Romford, for Mr. Joseph Smith, Mr. Joseph Harris, architect:—

Harris & Wardrop, Limehouse	£1,694 0 0
Davey, Romford	1,680 0 0
F. & J. Wood, Mile-end	1,653 0 0
Abraham, Romford	1,600 0 0
Staines & Son, Great Easton-street	1,572 0 0

For house at Dorking, for Mr. J. Clift. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove, Budge-row:—

Lynn & Dudley	£1,358 0 0
Hensgrove	1,345 0 0
Colls	1,374 0 0
Edson	1,280 0 0
Goddard	1,170 0 0
Kilby	1,087 0 0
Putney	1,005 0 0

For villa residence, near Bagshot, Messrs. T. Percy Harrison, Cooper, & Co., architects. Quantities by Mr. Edwin C. Pinks:—

Smith & Son	£2,921 0 0
Poole & Son	2,800 0 0
Watson	2,883 0 0
Alcock	2,886 0 0

For the erection of mortuary-chapel, entrance-lodge, boundary-walls, railings, and gates, and for the formation of roads and sewers, St. George, Gloucestershire, for the Local Board, Mr. W. H. Price, 3, Corn-street, Bristol, architect. Quantities supplied by the architect:—

W. J. Summons, Bedminster	£3,500 0 0
Eastbrook & Sons, Bristol	3,175 0 0
Stice & Sons, Bristol	3,146 0 0
R. J. Crocker, Bedminster	2,765 0 0
Hatherley Bros., Bristol	2,672 0 0
W. Corbin & Sons, Bristol	2,649 0 0
Martin & Woodley, St. George	2,634 0 0
J. E. Davis, Bristol	2,590 0 0
Henry Bevan, Portishead	2,496 0 0
Wilkins & Sons, Bristol	2,450 0 0
Torse, Br.-tol	2,430 0 0
Cair, Fishponds	2,115 0 0
H. J. Rossiter, Bedminster	2,100 0 0
G. C. Bennett, Portishead	1,959 0 0

\* Accepted.

For alterations to Juniper Hall, Dorking, for Mr. G. Macandrew, Mr. Alfred R. Pite, architect. Quantities by Mr. J. Rookwood:—

Cowland	£6,777 0 0
Nightingale	6,888 0 0
Higgs & Hill	6,880 0 0
Larter & Son	6,494 0 0
Staines & Son	6,374 0 0
Tongue	6,085 0 0
Palmer & Fotheringham	5,973 0 0
Falmer	5,865 0 0
Smith & Sons (accepted)	5,887 0 0

For alterations to the Corn Exchange, Bishops Cleeve, Messrs. T. Roger Smith & John Slater, joint architects, Mr. L. C. Rice, surveyor:—

Higgs & Hill	£3,874 0 0
Priestley & Gurney	3,830 0 0
Glassecock & Son	3,360 0 0

For the enlargement of Lyham-road Board School, for the London School Board, Mr. E. R. Robson, architect:—

Jerrard	£5,044 0 0
Tongue	4,761 0 0
Hunt & Hill	4,783 0 0
Nightingale	4,689 0 0
Downs	4,621 0 0
Higgs & Hill	4,540 0 0
Albion & Latta	4,500 0 0
Stimpson & Co.	3,883 0 0
Reading	4,260 0 0

For the erection of villa residence, West Dulwich, for Mr. Burton, Mr. J. T. Barker, architect:—

Joseph Higgs, Park-place, London (accepted).

For alterations and additions to 57, Paddington-street, for Mr. Seabrook, Mr. Hopkins, architect:—

Joseph Higgs, Upper Park-place, London (accepted).

For altering the gradients of Church-street, Woolwich, for the Local Board of Health:—

C. Loneragan 2750 0 0

J. H. Rinder 665 0 0

G. Ratty (accepted) 297 0 0

For building six groynes and 1,000 ft. run of camp sheeting, on the foreshore of the Cliff Park Estate, Gorseston, near Great Yarmouth, for Mr. Thos. Kelsey. Mr. Fredk. C. Kettle, architect:—

	In Memel.	Oak.	Pile Shees.	Facing Cliff.
Hill & Co., London	£1,030 0 0	£1,150 0 0	£30 0 0	£190 0 0
Harrison & Brighton	949 0 0	1,153 0 0	30 0 0	172 0 0
Teasdale, Yarmouth	832 11 0	1,158 5 0	51 16 0	323 5 0
Bonnett & Saunders, Poplar	771 16 0	1,233 19 6	72 0 0	233 6 8
Cook, Bennett, & Shaw, Spalding	700 0 0	1,110 0 0	35 0 0	185 0 0
Keymer, Gorseston	700 0 0	912 0 0	64 0 0	244 0 0
Winer, Hastings	698 0 0	1,180 0 0	41 per lb.	170 0 0
Walker, Lynn	640 0 0	860 0 0	20 0 0	120 0 0
Double, Southwold (accepted)	495 15 0	...	35 0 0	175 0 0

For the erection of coach-house and stable buildings, at Holly Lodge, Highgate, for Mr. W. Burdett-Coutts. Mr. H. H. Bridgman, architect. Quantities by Mr. Frederick Thompson:—

	Stable.	Fences, Drains, &c.	Total.
Southcott & Co.	£1,350	£135	£1,485
J. Dixon	1,285	175	1,460
Richardson Bros.	1,240	150	1,390
Scrivener & Co.	1,273	113	1,385
Kirk & Randall	1,127	118	1,245
Wall Bros.	1,118	119	1,237
E. Toms	1,067	102	1,169
M. Manley	982	105	1,087

\* Accepted, exclusive of Stable Fittings.

For cleaning and painting the London School Board, Mr. R. H. Robson, architect:—

Buckingham-terrace, Notting-hill:—	
Petchy	£325 10 6
W. Oldrey	287 0 0
C. Wall	282 0 0
Stimpson & Co.	258 0 0

Middle row, Kensal New Town:—

Parsons & Sons	£458 0 0
W. Oldrey	449 0 0
W. Titmas	442 0 0
Stimpson & Co.	426 0 0
Smith & Son	375 0 0

Whitefield-street, Tottenham-court-road:—

Larter & Son	£399 0 0
Petchy	376 13 6
Titmas	355 0 0
Stimpson & Co.	344 0 0
Derby	217 0 0

For two new houses, and alterations to old premises, next the Town Bridge, Guildford. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

Smith & Sons, Guildford	£1,800 0 0
Garnett & Mills, Guildford	1,789 0 0
Pearce & Clark, Guildford	1,735 0 0
Mitchell Bros., Shafton	1,756 10 7
R. Pink, Milford	1,766 0 0
G. Strudwick, Guildford	1,726 0 0
Martin, Wells, & Co., Aldershot and London	1,700 0 0
R. Nye, Guildford	1,698 0 0
Goddard & Sons, Farnham	1,692 0 0
Harris, Woking	1,645 0 0
Elliott, Guildford (accepted)	1,485 10 0

For new mortuary-chapel, caretaker's lodge, and boundary-walling, at the New Cemetery, Stoke-new-Guildford. Messrs. Peak, Lunn, & Peak, architects. Quantities supplied:—

Mitchell Bros., Shafton	£1,959 10 11
Martin, Wells, & Co., Aldershot and London	1,829 0 0
Pearce & Clark, Guildford	1,739 0 0
Garnett & Mills, Guildford	1,733 0 0
Woods, Weybridge	1,726 0 0
Strudwick, Guildford	1,685 0 0
Patrick, Guildford	1,650 0 0
Fowler, Woking	1,625 0 0
Pink, Milford (accepted)	1,698 0 0
Garland, Aldershot	1,679 0 0
Thos. Swaney, Guildford (withdrawn)	1,340 10 0

For two new shop-fronts and other additions to premises, Friary-street, Guildford. Messrs. Peak, Lunn, & Peak, architects:—

G. & H. Smith, Guildford	£587 0 7
Pink, Milford	563 10 0
Burdett & Son, Guildford	460 0 0
Moon, Guildford	448 0 0
Strudwick, Guildford	435 10 0
Pearce & Clark, Guildford	435 0 0
Garnett & Mills, Guildford (accepted)	430 0 0

For the erection of two new wings, at the Workhouse, Chelsea, for the Guardians of the Poor of St. Luke's, Chelsea. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities supplied:—

Scott	£2,240 0 0
Bendon	11,845 0 0
Batstone	11,743 0 0
Garlick	11,060 0 0
W. Johnson	10,975 14 0
Priestley & Gurney	10,899 0 0
Wall	10,650 0 0
W. Holt	10,650 0 0
Mears	10,487 0 0
Downs	10,475 0 0
Thorn, Chelsea (accepted)	10,000 0 0

For providing and fixing about 672 yards lineal of 12-in. by 4-in. hard York kerbing, and about 690 yards granite channelling, making up footpaths, &c., for the Leeds Committee of the parish of Kew:—

	Kerbing.	Channelling.	Footpaths.
	s. d.	s. d.	£ s. d.
Knight	5 0	18 0	...
Wheeler	3 0	7 0	...
Sims	8 6	inclusive	40 0
Mowlem & Co.	4 6	3 9	56 0
Ford & Everett	3 0	3 9	26 0
Dorey	3 0	3 6	48 10
Tomes & Wumsey	2 8	3 6	46 0
Nowell & Robson	3 0	2 6	40 0

\* 12 by 4 York kerbing fixed, at per yard.  
+ Granite Channelling, 12-in. by 4-in. Three stones wide, on 4-in. of Portland cement concrete, at per yard.  
‡ Making up footpaths and graveling same.





# The Builder.

Vol. XLII. No. 2055.

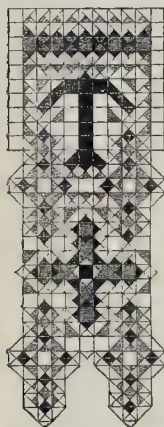
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Ancient Mosaic Pavements in the British Museum.

HERE are few, if any, classes of Roman or Græco-Roman antiquities that possess a finer character which command more attention, or illustrate more points of interest, than the beautifully tessellated pavements still surviving in the museums of Europe. The British Museum contains, in the Greek and Roman department, between seventy and eighty pavements, or parts of pavements and mosaics, and in the department of

British Antiquities several additional specimens are preserved, so that the total number of these artistic relics is not far short of 100. Of these, some were bequeathed, together with other Classical antiquities, by Sir William Temple; the Pourtales Collection contributed to the series, but the excavations conducted by Mr. C. T. Newton, C.B., at Budrum, the site of Halicarnassus, of which an illustrated notice was published in 1862-3, under the title of "History of Discoveries at Halicarnassus, Cnidus, and Branchidae," yielded a considerable number; and in the years 1856-8 the Rev. Nathan Davis, during the progress of excavations carried on by him at Carthage and Utica, on behalf of the authorities of the British Museum, discovered a large number of mosaic pavements, of which many are now repaired and exhibited on the basement floor in the rooms at the south-west angle of the Museum, beneath the Græco-Roman Gallery, and the Archaic Greek room. The pavements which excavations in England have added to these, are not placed with the foreign examples, but they have been mounted in rectangular frames and placed only temporarily, we trust, in somewhat incongruous positions on the walls of the gallery which contains the ionic Roman busts leading from the entrance-hall in a westward direction to the Egyptian Gallery. These come from Withington and Woodchester, in Gloucestershire; Abbots Ann, in Hampshire; the site of the Bank of England; and Thredneedle-street, in the City of London. Their subjects will be discussed further on, but in details of design, construction, and material they differ in no respect from those which come from the Greek and African sites already mentioned. It may, perhaps, be a subject of remark why the Museum is so insufficiently represented in this

class of Romano-British art remains, but it must be borne in mind that the difficulty of transporting large surfaces composed of loose tesserae, the difficulty of finding suitable positions for them in the already closely packed area of the British department in the Museum, sufficiently evidenced by hanging up several pavements over the busts and sarcophagi in the Bust Room, and the yet greater difficulty of prevailing upon the owners of the land whereon these tender antiquities are found to part with their treasures, all operate adversely to the acquisition of any very great or fine series of Romano-British mosaics. Hence it is that the celebrated pavements at Woodchester, Cirencester, Bramdean, and Bignor, those at Brading, Leicester, Itchen Abbas, and almost every Roman station of importance, still remain in their original sites,—some, indeed, walled in and roofed over, more or less protected from destructive weather and iconoclastic visitors, but by no means so secure as when the soft covering of mould shrouded them from the eyes of the too curious and the often too aggressive antiquary. There is little doubt that all pavements of this class, with very few exceptions, are slowly perishing for want of intelligent care and judicious treatment. For example, we may mention that which exhibits the Orphic myth at Cirencester, where in spite of a roofed protection, a considerable number of the cubes or tesserae are loosened from the pavement, the surface is very uneven, and gradual deterioration has been noticed to be setting in, which can only result in the total loss of one of the finest antiquities of its kind in England. The Museum authorities have done much to preserve their pavements by placing the upper surfaces downwards on a flat slab, and being thereby enabled to get at the concrete in which the tesserae are embedded. When by this means the pavement has levelled itself, and the concrete has been adjusted or renewed, and a hard bed thus made, it would be difficult indeed for any part of the pavement to sink out of the level again. Many of our finest pavements still *in situ* require instant attention in this respect, but we are aware of no machinery by which their owners can be prevailed upon to execute the necessary work. Of the age of many of the pavements found in Britain much conflicting evidence has been recorded, but even at the late period when the Saxons had established themselves in the island, the Roman pavements must still have been in perfection, and their influence on Saxon ornamental art may be traced in many of the details of their monuments, such as crosses, architecture, and manuscripts, and even on those of the Normans after them. The mode of constructing tessellated floors was preserved by the ecclesiastics to a comparatively late period, as Continental specimens testify. At St. Omer, according to Mr. Roach Smith, a fine specimen of the date of the twelfth century is preserved, of which

the details and fabric are closely copied from Roman prototypes in every respect except that the subjects are Scriptural, surrounded by the signs of the Zodiac. We believe that Mr. Thos. Morgan, F.S.A., is preparing a calendar of all the pavements hitherto recorded on British sites; such a work will be one of extreme usefulness to the antiquary.

The subjects upon tessellated pavements are naturally very diverse, but they seem to fall easily into a few groups or classes, such as, 1, mythological and legendary; 2, hunting scenes and animal representations; 3, birds; 4, water scenes and fish; 5, ornamental and geometrical devices. Let us see how far the British Museum collection of mosaics will illustrate these classes. And, first, we will consider the pictures derived from the mythology of Greece and Rome. The Halicarnassus pavement (No. 5 of the Museum numeration) is 12 ft. wide by nearly 41 ft. long, terminating in a semicircular apse. The subject is a group representing the water goddess Amphitrite among dolphins and fish. On either side of her is a Triton, holding up drapery stretched behind her, their heads being surmounted by the claws of shell-fish. The goddess is clad with a mantle cast over the right thigh, but is otherwise undraped. In the right hand is a mirror which reflects her face, with her left she smooths her tresses. This is an attitude not far removed from the conventional pose of the Mediaeval mermaid, of whom, perhaps, Amphitrite is the prototype. On the head is a golden-coloured fillet; the mantle is of an olive grey, and the drapery held by the attendant Tritons olive grey with yellow and red stripes. The bluish-grey background is evidently intended to represent the watery element over which the goddess shed her lustre. The border is intricate and harmonious. The mythic being, the Triton, is a favourite subject; he appears in another pavement (No. 69), wreathed about the head, and holding a dish of pomegranates and a shepherd's crook: here again dolphins and fish are introduced as accessories; the colouring is rich and harmonised, and the whole enclosed in a guilloche border of red tesserae, shaded delicately through orange into white. This fine pavement, 5 ft. by 8 ft., was discovered by Mr. Wood, at the Temple of Diana of Ephesus. Another (No. 63) represents a swimming Triton wreathed and mantled, and with a dish of fruit and crook as before, looking back at a companion Nereid, who is seated upon a fold of his fishy tail, on which also she rests the left hand. In the right hand she holds a drinking-horn. She wears a red *peplos*, armlets, and bracelets. Blue dolphins with red fins disport around this animated group, which, now measuring about 4 ft. by 7 ft., has originally formed part of a larger mosaic of which the border is composed of flowers and knots. Carthage contributes another Tritonic pavement (No. 46), nearly 4 ft. by 12 ft., where two groups are repre-



seated; in the first a wreathed Triton extends his hand towards a female Nereid, seated on his tail, and drawing forward a sea-green veil, which swells out with the breeze behind her head. Round her body is a yellow mantle, ornamented with blue and red stripes. The second group is imperfect, but not very dissimilar to that already mentioned. Here again we meet the necessary dolphins, which, according to the Greek canon of art, are introduced to represent the surroundings of the scene. The water is artistically indicated by broken black lines on a white ground. The border or frame, also on a white ground, shows the guilloche plait, and the embattled ornament, the colours being red, pink, yellow, black, blue, and green. Another Nereid is seen on No. 64, on white ground, with border of foliage in company with a Hippocamp, who bears the watery beauty on his tail and holds out a *patara*, or bowl, to his fair rider. In his hand is a red crooked stick, and on his shoulders a *chlamys*, or mantle; she wears a mantle, too, and her head is bound with a diadem. The ancient repARATION of this mosaic with a fragment of another pavement representing fish and waves, is of interest. Of marine deities, No. 68, nearly 6 ft. by 7 ft., presented by Mr. Hudson Gurney in 1844, shows a head conjectured to be that of Glaucus. The seaweed green of the hair, the curling plant-like beard, and the dark green lines on a white ground below the chin of the figure, representing waves, are worthy of notice. The head of a marine god appears also, between dolphins, on a fragment from Withington, in Gloucestershire, presented by Mr. H. G. Brooke in 1812, in the gallery of Roman busts. A mask of the youthful Dionysus, with long hair bound with a diadem, from a mosaic medallion (No. 30) found in 1856 in a large Roman villa at Halicarnassus, and a fine pavement (No. 20), about 4 ft. 6 in. square, from the same site, on which is the youthful god wreathed with ivy and wearing a red scarf bordered black, accompanied with the usual emblem, a panther, illustrate the Bacchus myth, and perhaps come from rooms destined to convivial meetings. The same villa contained No. 19, a spirited picture in tesserae of Europa, wreathed, and girt about the lower limbs with a "mantle blue," standing to the right, beside the tawny bull of Jove, whose body is marked with crimson and white. Another room of this richly-decorated villa supplies three fragments (Nos. 6, 7, and 8), representing Meleager and Atalanta engaged in hunting. They are riding at full speed from opposite directions towards the centre of the picture, to attack a lion and leopard. On the left hand, Atalanta, clad in the tightly-fitting yellow Amazonian jerkin and buskins, a red *chlamys* flying from the shoulder, and armed with quiver and bow, aims at an advancing lion; she is mounted on a dark blue horse. Meleager, on the right hand, in blue cloak and tunic of green and white stripes, thrusts his spear into a panther which is attacking him. A border of black wavy pattern on white enclosed this subject, the original dimensions of which were 15 ft. 6 in. by 7 ft. A mask of Medusa's head, a not uncommon subject of classical ornamentation, is seen on No. 22; the mask is full faced, dark red, the eyes, nose and mouth heightened with white; two concentric rings encircle it, from the outermost of which black pointed leaves radiate on a white field. This measures 3 ft. and comes from the same site. On the sea-shore of Carthage part of a large mosaic pavement was found (No. 44), measuring about 4 ft. by 7 ft., the subject of which probably relates to some public games. A figure of Victory is seen flying through the air, holding a large rectangular label, on which are eight lines of an inscription in Roman capital letters, white on red ground. The goddess wears bracelets, a red and white robe, and an over garment, black bordered, reaching to the hips. Thaggy personified is shown on No. 21, as a wild shaggy head encircled by leaves radiating from it, on a white ground, the hair yellow, shades of red for the face, and red, blue, green, white, and black for other parts. This is over 5 ft. square, and comes from the Halicarnassus Villa. Another similar subject, No. 39, gives yellow hair with black shading to the dread ringlets, the eyes being picked with white. Both of them are probably from the centre of an *agpe*, or buckler, on which the heads of Terror or of Medusa were frequently portrayed, in order to cause dismay to the opponent, a custom no doubt surviving from the barbaric ages of Greece. The Temple collection gives another pavement to the Museum series. This is a

mosaic, now made into a table-top (No. 70), supported by a pillar on which are sculptured in relief two *Manades* and as many *Satyr*s moving wildly under the influence of orgiastic frenzy. The subject is spirited and full of life, though treated in the conventional way and replenished with the accessories of such scenes, with which most of us are familiar. At Halicarnassus, Mr. Newton found in the villa a medallion mosaic, 1 ft. 9 in. diameter, with a female bust in tessellation, representing a personification of the city of Halicarnassus (No. 18), and inscribed with that name. The head is encircled with a crimson-coloured *stephane* or diadem. On the breast light blue drapery bordered with black cubes is shown, having two parallel vertical stripes of orange-coloured tesserae down the breast. Representations of the seasons may aptly terminate this first sub-division of pavement subjects. They are favourite designs with the artist; many such subjects have been discovered and recorded not only in England, as at Cirencester, for example, but all over the ancient Roman empire. From the prolific site of Halicarnassus comes a fragment, 2 ft. 8 in. square, representing Spring, personified as a youthful girlish bust (No. 9), whose long hair flows down the neck, the drapery being a dark red tunic, fastened on each shoulder by a circular brooch; from the ears depend a pair of earrings. The name of Spring, in Greek capitals, was inscribed in small cubes above her head. Another female bust of Spring from Carthage is at the corner of No. 42, her hair gathered over the forehead in a topknot, earrings in her ears, and her dress a white *chiton* or smock, with purple stripe on the right shoulder, and a red mantle thrown over the left shoulder. Summer season is also represented on the Museum pavements in two examples, the first (No. 10), from Halicarnassus, is a female bust with long flowing tresses crowned with ears of corn; the other, from Carthage (No. 43), a female bust wreathed about the head with ears of wheat, and wearing hooped earrings, a golden-coloured torque, a white *chiton* with yellow stripes on the right, and a red mantle over the left shoulder. The month of March is depicted in a Carthaginian tessellation of more than ordinary interest, for it illustrates a well-known pavement at Cirencester, which is adorned with a corresponding subject. This fine pavement in the British Museum (No. 41) exceeds in measurement 6 ft. by 7 ft. Here March is personified as a female figure leaning against a square *cippus* or altar, on which she rests the right hand. She turns towards another *cippus* on the right on which are two cups, and beyond it, at the extreme right of the subject there is a tree in the foliage of which there is a swallow, towards which she is pointing with the forefinger of the left hand, thus indicating the approach of spring. In like manner, the pavement found in Dyer-street, Cirencester, in 1849, has a figure of Flora, on whose shoulder the swallow, "harbinger of spring," is vividly and faithfully displayed. In this Cornish Flora nothing could better symbolise spring than the ruby-gemmed flowers with which the head of the figure is adorned. They heighten the effect. They are composed of tessellae of a bright ruby-coloured glass, the only instance of the use of this material in the Cirencester pavements, but, as we shall show by-and-by, a not uncommon material for the richer sort of tessellations found in Continental examples. In this Museum pavement there are shown a bronze-coloured bucket, with a green branch across it, and containing a white liquid, either water or milk; the personage wears an under tunic, green-bordered at the wrists, a saffron-coloured garment with hanging sleeves, and a green mantle with a purple lining. At her side is a plant growing in a two-handled vase, yellow shaded into red, and on each side of the vase foliage of an arabesque kind. April's changeable month is given on No. 42, a female, with a voluptuous expression, playing the castagnets. She may, perchance, represent one of the Gaditanian damsels, famed of old, as now also, for their skill in dancing. On the right is a circular *cippus*, on which is a little statue, perhaps of Love (for does not Love hallow the April of Life), with a leafy bower behind it. This is a charming piece of tessal art, full of poetry and feeling. It measures 6 ft. 9 in. by 10 ft. 6 in. Then comes ripe, matronly July (No. 46), another female, picking a mulberry with a stylus, daintily, from a dish of that fruit (which ripens in July), placed on a *cippus* under a mul-

berry tree. Over her green *chiton*, reaching to the heels, is a salmon-coloured garment with hanging sleeves, green striped with black and red. Last of the series comes November, a female too, holding a *sistrum* or musical rattle in the right, a *stula* or bucket of libations in the left hand, her sleeved undergarment is green, over it a yellow and white dress, the hair ruddy with a flaxen yellow topknot. We may place at the end of this class No. 29, a youthful male mask, with long hair wreathed, in a medallion.

The second class, that of hunting scenes and animal representations, is not quite so numerous represented in the British Museum collections. In Nos. 11, 12, two fragments of the same illustrative design,—an ibex, of bluish-grey, speeding to the right, is pursued by a hound of similar colour, with a red collar; another dark red hound, flecked with black, rushing forward, heads the quarry. No. 47, a rudely-made mosaic from Carthage, of the size of nearly 4 ft. by 9 ft., has for its design a mounted huntsman at full speed to the right, cheering on his dark blue dog towards a lost game; at the right an orange tree, laden with fruit; behind are tall plants and the broken lines of the rugged countryside. The dress of the hunter is a red jerkin with a black and white side stripe, and black boots; the horse is of a drab colour. From Utica another hunting scene is derived (No. 65), measuring 5 ft. by 11 ft. Within a fence of network are gathered a wild boar, a stag, a roe, fox, and panther, an ostrich, and two other birds, all in their proper colours; at each end of the net is a boat manned by two hunters, naked, except that one has a cloth around his loins. The scene is evidently laid near the shore of a lake or river, the ground is white, besprinkled with a few green sprigs; in the foreground are two lizards and a tree; near the boat, on the left, which, like the other one, has a sharp prow and stern, blue-black and red, with a yellow streak from end to end, are two fish. These water-hunters are hauling in the end of the net so as to narrow the space in which the quarry is enclosed. It is an animated and interesting glimpse into the sports of the past. On another pavement, not yet numbered, in this room, is portrayed a hare coursed by a greyhound; and one of the Withington pavements in the Gallery of Roman portraits shows part of a boar-hunt arranged in a circle, with an outer border of birds. The animal forms which naturally fall into this second group consist (some in addition to those already described) of the lion, leopard, panther, horse, stag, bull, goat, dog, and deer. On four the lion occurs; in two of them the monarch of the beasts is rushing to his prey,—a bull and goat,—at full speed to the right (Nos. 13, 14). In front of him in each case is a tree. The colours of these lions are yellow, red, blue, white, and black. Their form and design may be contrasted by the artistic student with those of the lion of the Orphic pavement at Cirencester, the one spell-bound under the musical numbers of the master's lyre, the other masterful, rampant, and full of life, in quest of his prey. Almost the same colours are employed in each case, but differently arranged. The leopard and lion in the scene of Meleager and Atalanta have been already pointed out; so, too, the panther of Dionysus. The horse is seen in No. 1, where a wounded horseman is lying on a truck by the side of his charger, perhaps a part of a pavement representing the games of the circus. This came from the Pourtales collection. Another fine Carthaginian pavement, not yet numbered, in the inner room, shows a horseman successfully lassoing a stag, at full speed, to the right. The stag is seen, not only on this pavement, but on one of the tessellated pavements found at Withington, and now on the wall of the gallery. A stag and deer drinking by a fountain may be seen on No. 47, from Carthage. The Jovian bull of Europa we have already noticed. Dogs are not uncommon, in many attitudes, and of various hues. The goat occurs in No. 48, where two are springing forward to the right; one is pierced in the side, the blood falling to the ground. They are fawn-coloured, shading into grey, with black outlines. It is a late and coarsely-made pavement from Carthage.

Bird pictures form the third class of our division. On nearly twenty of the British Museum pavements they occur as subordinate accessories. They are mostly of the domesticated kind, if we except the ostrich which is found in the drawn net scene; the eagle, a favourite military symbol, strange to say, does



not appear to occur. The medallions of the Heliocarnasian vase comprise a duck, cocks, and other birds on branches (Nos. 23-26, 28); a bluish-grey bird, with wings, crest, and legs red, holding a twig in the beak (No. 31). A francolin is given in No. 48, the scene of the wounded goat, speckled blue, yellow, and red. A peacock, guinea fowl, and other birds occur in No. 67; the brightly-coloured tesserae, probably glass, of many of these birds seems to have been in ancient times purposely picked out of the pavement. It is from Utica, and some part of its design may be compared with the gorgeous peacocks of the Cirencester pavement. There is a drinking peacock in a fountain scene (No. 49). Ducks and pigeons occur on some pavements not yet numbered in the lower room; and some birds are found on two British pavements in the Bust Gallery. Our next class comprises fish and fishing scenes.

Perhaps these subjects adorned baths and bathing-rooms. The fish are not only subordinate to more pretentious scenes where they are used to indicate locality, but frequently occur alone as the principal element of the composition. Just as we have already pointed out, in our recent notice of the archaic Greek vases in the Museum, objects of marine origin entered largely into the ornamentation of the early pottery of a people so pre-eminently maritime in their proclivities as the Greeks, so here also, in pavements which, as a rule, must be attributed to a late period of classical art, the dolphin in Nos. 5, 15, 16, 46, 53, and others, as well as in one of the Withington pavements; the long-snouted wrasse and the sword-fish (No. 4); the *dentes* and the *sparus* (No. 27); a deep-bodied thick fish (No. 33); a red and yellow perch and black and purple lobsters (No. 51); the *murena*, prawns, tunny, wrasse, sea-perch, and lobster, fallen from a fish-basket, all in natural colours finely shaded in Nos. 52; the red and the grey mullet, dolphin, *dentes*, and wrasse (No. 66); and several others present themselves to the visitor as he makes the circuit of the room. Water-scenes and fishermen belong to this class. Boats occur in two pavements from Utica; the examples are of pointed beaks, one has the curving neck and head of a swan for a figure-head (No. 66); over the gunwale hangs a line or the edge of a net. One of the fishermen is raising out of the water a fish which he has hooked. The last class into which we have divided the subjects of the tessellated pavements, that of geometrical and ornamental devices, may be illustrated from almost every existing specimen. These patterns are, in several instances, not subordinated as borders, but they form the whole ground of the design. Many of them, from the strong contrasts of their colour, and others for their subtly-blended shades, stand out as marvels of the application of simple rules of geometry and of rudimentary designs to highly artistic ends. Hence the guilloche twists, cabled borders, threefold and fourfold plaits, meanders, rosettes, ivy-leaves, quatrefoils, crosslets, and other simple devices, cunningly retained by the true feeling of the artist from the oldest periods, please and gratify the eye that has already feasted upon far more complicated patterns, beyond expression, from their pure simplicity and chasteness, and we must go back 2,000 years to find the origin of patterns which, even to-day, form the stock-in-trade of the designer and colourist. The guilloche pattern is seen to good effect in three pieces of pavement from Abbots Ann, Hampshire, presented to the trustees of the British Museum by the Hon. and Rev. S. Best, in 1854; the spiral, with radiating leaves, in the little bit of the Woodchester pavement, in the same gallery; the plaited border, enclosing a circle in which is a floreated cross, on the right-hand of the gallery, in a pavement found on the site of the Bank of England, and presented by the governor and directors of that institution; and an elegant picture of alternate squares and lozenge, enclosing fourfold knots, rosettes, meanders, and quatrefoils, is preserved on a pavement found in Threadneedle-street, in the City of London, and presented by Mr. E. Moxham to the authorities of the Museum in 1841. The chequer-pattern, representing rows of parallelopipeds seen in perspective, coloured white, black, yellow, red, and green, is shown in two pavements bequeathed by Sir William Temple (Nos. 8 and 9); squares and lozenges, enclosing a quatrefoil, in No. 37; cubes in diagonal rows, with an embattled border, in No. 59; the lozenge, guilloche, and *pelta*, or Amazonian

shield, a very archaic ornament, in No. 5; the guilloche and black-and-white wave pattern in No. 8; guilloche and chequy border in No. 45; intersecting circles, green and red, embracing crosses and quatrefoils, in No. 54; ivy-leaves in No. 57; and star and flower patterns in No. 60. Of this class, a fine pavement at Leicester has nine octagonal compartments, enclosing quadrilateral and triangular figures interlaced by a rich guilloche of various colours. It was discovered in 1830, and originally about 24 ft. square. Inscriptions and explanatory words or names occur on several pavements in the Museum collection, but we must leave them to say a few concluding words upon the fabric of the pavements and their component parts.

Many of them rest on a concrete floor carefully prepared upon the natural earth, which was probably beaten hard first of all; others, however, especially when in connexion with hypocausts, rest upon short pillars made of loose courses of tiles or bricks about 1½ in. thick. Each pillar has a larger tile for a base or plinth, and another of the same size by way of a capital. They stand in rows at irregular distances, some about 1 ft. 6 in., others as much as 2 ft. apart. These capitals are then covered with brick tiles of 2 ft. square, forming a flagged surface, upon which the concrete backing of the pavement itself rests. The antiquary Lysons, who took great interest in these remains, states that the foundation of a pavement which he published in the "Reliquie," consisted of rammed gravel, covered to a depth of 6 in. with a concrete composed of gravel, lime, sand, broken tiles, and rubbish. This was covered in turn with 4½ in. of a mixture of pounded brick, lime, and sand, over which were laid the tessellæ about ½ in. in depth. The materials of the tesserae themselves have frequently formed the subject of special inquiry. No doubt great care was exercised in choosing choice specimens of coloured stone, marble, and other hard materials from the vicinity of the place where the work was executed. Sometimes, however, materials have been employed which, though excellent in respect of tint, are of so soft and friable a nature that they are not suitable in any other respect. This selection was, perhaps, guided by the effects observed by the designer in a previously drawn and coloured working plan. In shape the pieces vary from about 1½ in. diameter to a mere chip, and it is this variation in form and size, as well as in contour when the design needed curves, that the work was rendered so free in outline as we frequently see in old pavements; modern imitations are too regular in size, as though the cubes were machine-made. The prepared tessellæ were united to the terraces, or bed, by a firmly-setting cement, of fine lime, so strong in its adhesive qualities that a slab of dry work would fracture as readily through the cubes as at the joined edges. Finally, the surface was polished, and the varying lustres of the various materials contrasted together to heighten the effect of the whole. Of natural colours Buckman found the white to be a chalk; green, colour, a freestone from great oolite; grey, the same after roasting; yellow, oolite and pebbles; chocolate red, old red sandstone; slate and black, from the limestone bands of the lower lias. The artificial colours were light and dark red, and black, from terra-cottas, susceptible of little or no polish; and a transparent ruby colour, of glass, the occurrence of which material in British mosaic pavements is exceedingly rare, although in Continental mosaic by no means uncommon. He concluded that glass was sparingly used in British pavements because only one figure, that of the fine Cirencester Flora, contains it, out of the great number of pavements already excavated. Voelcker's analysis of this glass gives oxide of lead, protoxide of copper (in considerable bulk, to give the colour), alumina, oxide of iron, silica, and potash. The use of gold for the ruby colour is believed to have been unknown before the seventeenth century. In one of the British Museum pavements, that of the wounded goat (No. 48), there is a bird on a branch, called a francolin, of which the somewhat small tessellæ are in many instances of glass, of a deep lapis lazuli colour; other birds (No. 67) have glass cubes of turquoise blue; and the fine head of a marine deity (No. 68) has yellow glass or topaz-coloured cubes in the beard, perhaps other gems or glasses as well, which produce a striking effect when awakened into life by a beam of light. Interesting as these pavements are, as monuments of the past, they have, says Mr. Westma-

cott, a further claim on our attention for the qualities of art which they exhibit, and in this respect they claim a superior place among antiquities. The execution is somewhat coarse sometimes, but this is owing to the nature of the materials and the mode of workmanship. The details and drawing may be rude, but apart from these mechanical and technical defects, there is a style in them which elevates them to the best period of art. Another point of comparative excellence is the quality, breadth, and distribution of their colour; there is a picturesque grandeur about them, a strong love of nature, and a thorough acquaintance on the part of the designer with the full extent of their applicability. Hence their success and esteem in old times, their appreciation and importance as teachers of true art in our modern collections.

#### SEPUCHRAL AND MEMORIAL ARCHITECTURE.

No one will deny the interest, historically speaking, of the subject of the architectural treatment of sepulchres and memorials of the dead. The desire for such memorials has been developed so early in the civilisation of every nation that the style and character of tombs among each nation have really been, in some cases, among the chief factors of the future architectural style of the same people, and even of others who have succeeded them and developed their ideas. The most remarkable instance of this is to be found in the fact that some of the forms of classic architecture, indeed the most important parts of them, which have been multiplied and repeated *ad infinitum*, and have influenced more or less the architecture of the whole civilised world down to the present day, are drawn from the architecture of rock-cut tombs in Asia Minor, which were themselves drawn from a wooden architecture (probably domestic) that has perished, but as they stand are, nevertheless, the origin of a great portion of the details of the Classic "order." But there is another interest in the subject for the architectural artist, besides the historical one. For the sepulchral monument or memorial, when it approaches to at all a large and elaborate scale, affords an opportunity, seldom afforded now, for architectural design absolutely free from the trammels of practical requirements, for the indulgence of fancy in the attempt to make a thing of architectural beauty of detail and proportion and expression, free from any consideration as to position of windows, or doors, as to general plan or ventilation. The architect who has to design a monument is for once and for the moment free from the prosaic side of his art, and at liberty to play with it as he pleases.

We have used the terms "sepulchral" and "memorial" architecture as having a separate meaning. The class of work we are considering may, in fact, be divided into three heads. The tomb or sepulchre may, in its simplest form, be regarded only as a place of safety for the body, to which so much reverence has often been attached; a stronghold securing it against theft or spoliation by man or beast. The next stage is the decorative treatment of this citadel, so as to make it at once an opportunity of showing honour to the deceased and a memorial of him to the eyes of succeeding generations. Then comes the third stage, when the memorial is entirely separate from the sepulchre, and is a monument pure and simple, an erection to recall the dead to mind and record his achievements, placed in some site where it may be conspicuous, but which might have been inconvenient or unsuitable as an actual place of interment. In this case the sepulchral idea may be abandoned; the monument, that is, may cease to give any idea, in its design and construction, of being the receptacle of the dead, and may take any form and character which, to the designer, appears most suitable and expressive. When the memorial is not separate from the tomb, then the sepulchral idea should always be at least hinted at, so as to preserve the true expression of the actual meaning and function of the erection.

There can be little doubt that the earliest form of sepulchral monument was the mound heaped over the site of the tomb, to mark the place from a distance. This is the most natural and simple manner of making such a monument; and when this form of monument passed first into what could be called an archi-



tectural stage, its shape and construction seem to have been determined in the first instance by structural considerations. For this is the probable origin of the upright base of masonry which is so constant an accompaniment of the mound form of tomb, and which retains its importance even after the tomb has ceased to be actually a mound, and is a built-up pyramid of masonry construction. Originally this masonic base to an earthen mound served both to define the limits of the monument, to preserve it against distortion from the slipping down of any of the material, and to allow of entrances being conveniently made to the interior. This form of pyramid upon a drum or base of masonry is due, as far back as our knowledge takes us, to the Etruscans, who have at any rate left the earliest known examples of it. The same form occurs as a favourite one not only among the Romans, who were the natural heirs to Etruscan ideas, but in the tops of India, for the latter exhibit the same form in its essential features; the drum with the mound rising above it is there, only with the difference that the mound is domical in form instead of pyramidal. In the Roman tombs derived from this Etruscan form the upper portion takes the shape of a series of steps, and the drum portion becomes in many cases the opportunity for the application of a cornice and an order of pilasters or columns exhibiting very refined qualities of architectural detail. The stepped pyramid above is a method of finishing the structure not by any means worthy of the ground story in these cases, or in keeping with it; and a much more effective and more artistic treatment of tombs on this principle might be devised, having the same general outline, but differing in detail, were there ever any occasion for tomb buildings on such a scale in this utilitarian and matter-of-fact age.

The Egyptian pyramidal form belongs to a different category from this Roman and Etruscan tomb. It is square, not circular, and it wants the raised architectural base, and rises straight out of the ground; but in all probability it may be classed apart for another reason, that its main intention is not so much monumental as preservative, and it is, in fact, more distinctly a tomb and less of a monument than the Etruscan form. For with the ancient Egyptian the preservation of the body until a far-off day of resurrection was all-important, and the pyramidal tomb of the monarchs, who alone probably could afford this best chance of preservation, seem to have been intended to be as far as possible indestructible and impervious, mainly with this object. To us the architectural interest of these tombs is of a somewhat commonplace order in reality, being merely that of huge mass and stability without expression, excepting that of durability, however impressive they may appear through the influence of association with the distant past. But we find in the works of the later dynasties of Egyptian kings examples of monuments and tombs of quite a different order. These may be divided into two classes, tombs with architectural façades, but which are *bona fide* tombs intended for the preservation of the body, and obelisks, which come under the third head of monumental objects not immediately connected with the place of burial. The Egyptian rock-tomb seems to have practically just the same object as the Pyramids,—that of preserving the body in security from decay and destruction. The builders of the Pyramids erected a mountain of masonry with a sepulchre in it for this purpose; the later Egyptian kings cut their sepulchres out of the natural rock, and provided them with an architectural façade. How wide spread has been this method of architecturally treating the sepulchre it is needless to remark, nor how important in architectural history are some of the lessons to be read from these architectural sepulchre frontals, of which the Lycian set have, as observed, played so remarkable a part. But it is worth while to suggest whether there is not a beauty and a fitness about this treatment of monumental architecture, where the ground admits of it, which might very well be made more use of than it is in modern times. The modern "vault" is usually sunk vertically into the ground, and a monumental erection built over it, or over part of it. In the Lycian rock-cut tomb, and others of the same type,—the tomb is excavated horizontally in the earth or rock, and a façade hewn or built before it. This was a type of tomb peculiarly suitable in days when it was usual to consume a body, and when nothing remained

to be preserved of the dead save, as Tennyson puts it,—

"Two handfuls of white dust, shut in an urn of brass."

Then the urns which held all that remained of the departed could be ranged on shelves or in niches in the sepulchre, and the chamber became a sacred home of the dead to which the door in the centre of the façade gave entrance, so that the façade now had really an architectural signification. This was the case also in some tombs of the Etruscan type, and in some Roman family vaults, where niches for urns were provided, not only for members of the family by blood, but for the class of servants and "freemen," as parts of the family, considered in its widest social sense. Among the ancient Scandinavians, in pre-historic periods, there are traces of the same arrangement; there would appear to have been two distinct classes of monuments, strongly analogous to the Egyptian rock-cut tombs and obelisks respectively, viz., "gallery graves," in which the remains of families or tribes were placed in due order and grouping, and "dolmens" which were apparently monuments of special individuals of importance.\* This form of sepulchral architecture seems to have a special practical interest for us in the event of the possible more general adoption of cremation; we say "possible," for we incline to think there is a considerable feeling of opposition to this method, partly from sentimental and partly from practical reasons, which will take considerable time to surmount, though we are disposed to believe it will be surmounted by degrees. But if this system were more largely adopted, the tomb cut in the side of a hill or of rising ground, with its niches for urns or for regularly designed memorials of those whom it was desired to commemorate, and its architectural setting visible from a distance and giving access to the room around which these memorials were placed, would certainly be a form of monumental sepulture eminently suited for the supposed conditions, and would give many interesting opportunities for new and picturesque variations upon an old architectural idea, and a very beautiful and suggestive one.

The Egyptian obelisk is perhaps one of the best simple ideas that have ever been suggested in the way of marking from a distance a tomb or the neighbourhood of a tomb, the occupant of which it is desired to keep in remembrance. The idea which gives rise to this use of a lofty object as a monument is one which is almost, as it would seem, inherent in human nature. It is a pleasing and a soothing idea to the man who dies, perhaps with great purposes unfulfilled, that at least the query as to who he was and what he aimed at doing, shall be suggested to thousands of passers by for many generations by some landmark which shall not fail to excite attention and arouse question, as in Matthew Arnold's poem of the young hero who died slain in fight by his unknown father,—

"And plant a far-seen pillar over all,  
That so the passing horseman may exclaim,—  
'Schrab, the mighty Rastum's son, lies there,  
Whom his great father did in ignorance kill';  
And I be not forgotten in my grave."

This is the real philosophy, also, of the use of the column as a monument, a use which, in this manner, is not so absurd as it sometimes seems in the way in which it is misused in modern days, when a statue is sited at the top of a column, where no one can possibly see it. But, apart from the statue, the column supplies what is wanted, viz., some kind of tall object, not without form and comeliness, which may be seen from a distance, and may prompt the memory of him to whose honour it is erected. The column is not the best form to use, since it suggests the idea of supporting weight above its capital; but, without the customary statue, it is a partially excusable convention. But the Egyptians may claim the merit of having found the exact form proper for the purpose. The obelisk fulfils the purpose of calling attention from a distance; it is graceful in outline, and suggests no idea of supporting anything which is not there, or of being a portion of any form of architectural design far away from its surroundings as the memorial column does; it is an object complete in itself, and exactly answering the purpose for which it was intended. It is true that the obelisk has suffered an evil fate, as being phallic, and therefore repugnant to our modern ideas; and no one who has looked through some of the Egyptian painted subjects

which are either published or of which drawings are to be found in the British Museum can doubt that it was at least regarded in this light by some Egyptians. But the transition from pyramid to obelisk seems so natural and easy, the other derivation so much the reverse, that we imagine that it is still a question whether this coarser meaning was not merely tacked on to the object by vicious imaginations, and whether, in fact, the obelisk does not represent merely the best form of "note of admiration," as one may call it, which can be put up to call attention either to the building before which it stands or to the memory of a deceased person. As such, at any rate, it has been extensively revived and used in modern times, and as such we think it may very well be used still; but it may be capable of modifications, especially as, in many cases, the same severe material, granite, originally used all but universally for this form of monument, may not be available, for economic or other reasons.

The form of tomb which has been connected for ever, perhaps, with the name of Mausoleus (whose widow probably hardly imagined how successful her great monument would turn out to be in perpetuating his name), probably arose out of the mound form, or rather it is a kind of combination of that with the suggestions of the rock-cut architectural form of tomb. Just as the circular Etruscan mound developed, with the Romans, into the circular-stepped pyramid, so the square mound or pyramid became with the later Greeks the square-stepped pyramid crowned with some kind of figure, and rising from an architecturally-treated basement of more or less height. We can imagine that before built-up tombs were made at all, the idea of crowning a sepulchral mound with a figure to give it meaning and expression would very naturally occur, and such monuments as that at Cnidus, of which the lion now in the British Museum was the crowning figure, were the architectural form into which the simple idea of a mound with a figure or symbol upon its apex developed itself. The Mausoleum was only the same thing on a very grand scale. The Romans adopted this idea from the Greeks, but they could seldom shake off entirely the influence of that preference for the circular form of tomb which had been established from time immemorial on the Italian peninsula. The mole of Hadrian, as remarkable a work as the Mausoleum, was in its original form a kind of repetition on a circular plan of what was done in the Mausoleum on a square plan. The tomb of Cecilia Metella, and others of the same general form of design, seem to represent a combination of the two elements, the square Greek or Asiatic base being used as a substructure for the Etruscan circular tomb, both giving it a greater aspect of security, and raising into a more suitably conspicuous position as a monument. The Romans, however, made many variations of their own, on a smaller scale, on the Mausoleum form; sometimes it was a small plastered and pedimented temple raised on a plain rusticated base; sometimes the base or lower story was considerably larger and architecturally more important than the actual monument, and took the form of an arched structure not very dissimilar from the usual Roman form of triumphal arch, with a smaller square tomb built on the top of it: not a very well-conceived or suitable form either architecturally or monumentally; the upper structure seems to weight the arch too much, and to make the basement of a tomb or monument an open gateway is not in accordance with the true idea of such an erection. This is more suitable, in fact, to a monument only, having no connexion with a tomb, such as is properly called a cenotaph, a word meaning simply "an empty tomb," a tomb erected for ceremonial only.

The Greeks suggested the same form of monument as the obelisk, the mere monument without even the appearance of a tomb, in a very pleasing form in the "stèle," a word signifying literally an upright stone. This form of memorial was probably actually suggested by the obelisk; but whereas the obelisk is most effective in simple form, and on a grand scale, and in very severe material, the Greek stèle gave the opportunity of treating the same kind of memorial in a lighter and more graceful and varied manner, and on a smaller scale. The stèle is the connecting-link between the Egyptian obelisk and the Christian gravestone: in its early form it preserves the character of a square, upright, and rather tall stone, of the same nature as the obelisk; in its later form it

\* See Nilsson's "Early Inhabitants of Scandinavia."



is shorter and not square in plan, and borrows from architecture the decorative feature of the pediment, at least in some cases. Thus we may say that our upright headstones in modern cemeteries are of Greek descent, while a considerable proportion of the horizontal grave-slabs are of Roman descent. For the Roman built tomb contained occasionally, instead of an urn or urns, the stone semblance of a heavy coffer, in which the remains, whether in-urned or not, were supposed to be placed; and this coffer form has frequently been repeated in modern graveyards, very unsuitably, since its only meaning is as a chest or receptacle to hold the body or its remains, and it is therefore absurd to place such a form over a grave in which the real remains are interred far below the surface. We will hereafter touch on some of the forms of monuments prevalent since the Christian era.

#### SOME CONSIDERATIONS CONNECTED WITH THE MODE OF BUILDING PRACTISED IN RUSSIA.

IN contemplating the structure of houses in any country but England, we may generally take the climate or average temperature as a clue to the *rationale* of the way of building. We are, however, much too magnanimous to allow the petty consideration of what is best adapted to our wants to influence us in the construction of our houses. In Russia the case is different, for there the signification of the word "winter" differs greatly from the idea which is attached to it in England, and the chief objects to be borne in mind in the construction of dwellings are, first, to keep out cold and, secondly, to keep in warmth.

A reference to the plan of an Esquimaux hut would give the simplest and roughest solution of this double problem. It is circular in plan, and the centre of the circle is occupied by the hearth, over which in the dome-like roof there is an aperture for the passage of the smoke. The centre of this one-roomed house, being occupied by the fire, shows us the natural position of the heating element in such an extreme case, while the thickness of the walls, covered during winter with a thick blanket of snow, points to the solution of the second part of our problem.

Although the Russian peasants do not live in Esquimaux huts, the principle of heating from the centre and keeping the heat in is as applicable in the case of the "Ezba" or cottage of the peasant as to the construction of the hut of the Esquimaux. The shape of the dwelling naturally differs in the two cases. The material for building offered to the Russian is wood; his house is formed of trees felled and laid one upon another to the required height, which involves right lines and right angles in the structure of the cottage in place of the circular wall of the hut.

In Russia there are immense forests of pine and fir; these offer at once a cheap and ready material for the construction of the hut and for the means of heating it. In the building of these simple dwellings we see, carried out with greater art and refinement, the same idea which we have alluded to in the hut of the Esquimaux. The thick trunks laid one upon another, and joined together at the end of each log by a notch cut half through the thickness, so as to receive another log with a similar notch placed at right angles to it, are so arranged as to form a square frame; on this another precisely similar is raised, until the whole attains the desired height, forming a sort of square box. In the corners of this box huge posts are driven in, which strengthen the whole edifice and help to support the roof. The side walls are carried up beyond the last layer in the form of an obtuse-angled triangle, with its base on the highest course of wood. In the centre of this wall and of that opposed to it on the other side, there is frequently a post fixed which tends to the support of the wall and of the roof. The latter is very often built on the ground and lifted on to the wooden walls after their completion. Generally, the triangular structures stopping the gable-end of the roof are filled in below, and the whole raised to its position on the walls, as before indicated. The roof is, of course, nothing but a framework of wood, on which thatch, boughs, or small pieces of board as shingles are laid, thatch being the favourite, and in the middle a square aperture is left for the passage of the chimney. The ingenious manner in

which the logs are locked together by the notches above referred to, renders the structure firm, and the interstices between the logs being filled up with tow and hemp, somewhat as caulking is done on board ship (minus the pitch), both from within and from without, a tolerably safe barrier against wind and snow is set up. This is often rendered more secure by planking over on the outside.

The next object is to provide for the heating element, and this is generally done by the erection of a stove of clay or bricks built in the middle of the floor, and reaching up to the roof, or in some cases but half the way, a rude chimney being constructed, passing through the centre of the roof. This stove is a cavernous oven, capable of consuming, in rapid combustion, a seriously large quantity of wood (generally birch). As soon as a certain degree of heat has been obtained, the aperture of the chimney is closed, to prevent loss of heat into the cold outer air. The embers, still glowing, but not smoking, impart their heat to the bricks forming the stove, which becomes uniformly hot all round, the mouth of the oven is then closed, and the room is heated to an extent and with an amount of regularity of temperature hardly conceivable to those who have not seen the machine in action. In such a hut one, or at most two, windows, of the most diminutive size, fastened by wooden shutters when unglazed, are sufficient for the wants of the family, as far as lighting is concerned, while the ledges formed round the stove in its brickwork would offer the warmest and most convenient bedstead that a Russian peasant could desire. Such is, in effect, a Russian interior among the peasants. A shelf of wood going all round the four walls of the chamber affords at once couch, chair, bench, and wardrobe to the easily-satisfied Ivan; while a table of the roughest possible kind finishes the catalogue of the actual furniture. In this one room, on various sides of the stove, sleep the master, mistress, children, and daughters of the house, while the sons and other male workers repose on the shelf alluded to in the concise list of furniture above given.

A more aspiring peasant divides his hut in two portions by a wooden partition, or bulkhead, in one of which more favoured animals are permitted to stray in from the neighbouring "serai," or shed (or outhouse), to share in the warmth of their lords and masters, nor are they by any means rigorously excluded when the partition fails. A step higher in the social scale gives us another partition crossing the first, forming four rooms, all equally well warmed and sustained at a pretty even temperature, on account of the slow cooling down of the bricks of which the stove is made, and of the non-conducting property of the wooden walls and snow-decked roof. The less we say of ventilation in this primitive mansion the better; nor, when the family is numerous, the chimney a little defective, and the wealth in live stock considerable, is the odour altogether calculated to please the olfactory of the fastidious.

Rising in his pretensions with increasing wealth, Ivan aspires to a *corridor*, or, at least, to a sort of ante-room, which may receive a visitor before letting him into the heated room or rooms, and consequently letting out some of the beloved calorific, for which so many sacrifices have been made. The new comer shuts the outer door before opening the inner one, enters the chief apartments just described, off one of which this *entrée* has been cut. A further refinement carries this corridor through the house, and then two modes of construction become possible.

First, we may have this corridor carried along one side of the house, giving admission to two rooms, or it may pass through the centre of the house, giving admission, by doors to the right and to the left, to the four rooms, which then are heated by two stoves, the house being the double of that first described; such a construction, however, is less common.

But on account of the ease with which a house, built of such combustible material, is burnt, it has been thought fit to prohibit the building of wooden dwellings, within certain limits, in Moscow and St. Petersburg. Without those limits, however, in all the suburbs, in the country places around, and in all villages, houses are still built in the old way, with the old material.

The law is sometimes oddly evaded by building a house with a brick basement and a wooden superstructure, so that the lower floor with its

"*kvartiers*" forms a brick house, and thus the police regulation is complied with, while it is evaded by the addition of timber rooms above.

As far as drainage is concerned, Russia has much to learn. Open cesspools are the order, or disorder, of the day. Some canals or sluices have been cut in some of the great thoroughfares; but when a thaw sets in, or a heavy fall of rain happens, they overflow, and the low-lying parts of the town are flooded. At the side of the pavement (?) next the road there is a wide gutter, down which the water rushes like a mill-stream until it reaches the apertures leading to one of these sluices, by which it is intended to carry it off to the river. Over these gutters, before the door of each house, there is a little wooden bridge, so that persons stepping from a carriage are not compelled to take a flying leap to gain the footpath. But when the flood is very high, these bridges are often overturned or carried away altogether.

The land belonging to the house extends to the middle of the road, and includes as much of the length of the way as corresponds to the façade of the house. Each householder *paves* (?) according to his own taste at as cheap a rate as he can. The result is a mosaic more striking than agreeable.

Along the sides of the larger and better streets many mansions, all differing in external appearance, rise imposingly; but however they may differ in outward show, the old theory of warming from the centre still holds good. Rooms are built in pairs, or in sets of four, warmed by the same stove, and leading one into another. We shall consider these structures in order, from the smallest house to the palace.

The smaller houses are nothing but reproductions of the four-roomed *ezba* (or hut) save that the walls are of brick, the windows large and double, the stove of very ingeniously contrived fire-bricks, so constructed as to form a system of pipes in the interior, through which the heated air is made to circulate. The surface of these stoves is white and highly glazed, so that the cleanliness of the appearance is extreme. Beyond these four rooms is yet a fifth, which acts as a kitchen, and here another kind of stove comes into play; this is something like the cavernous oven used by the peasant for heating and cooking; but, besides this, it is sometimes furnished with an apparatus consisting of an iron plate with circular apertures closed by a series of concentric rings. Below this plate a wood-fire is made, and pots of various sizes may be introduced by removing rings from the aperture in proportion to the size required.

A house of two stories is the same thing repeated on two floors, and is adapted to the accommodation of two families. But the general mode of building provides for four families, two "*kvartiers*" being on one side of the grand entrance and two on the other. In the towns all roofs are made of sheet-iron painted green.

There is, however, another system of construction, borrowed from Germany, greatly adopted in St. Petersburg (and beginning to be followed in Moscow) of enormous barrack-like houses, built of brick and constructed sometimes to accommodate families in various "*kvartiers*," and sometimes to accommodate individuals in a manner something between hotels and furnished lodgings. The walls of these houses are fabulously thick. There is one at St. Petersburg where the embrasures of the windows show a thickness of 3 ft. 8 in., all solid masonry of the best red bricks at 32 roubles a thousand! These great establishments are generally three stories high; those designed for the accommodation of families are divided into "*kvartiers*" of from four to eight rooms, each forming a self-contained commodious lodging. Those which are destined for the accommodation of single lodgers are built in immense flats, through each of which runs an enormous corridor, on each side of which doors lead to the various lodgings, which consist mostly of a sitting-room, bedroom, and ante-chamber. Sometimes such a house accommodates as many as 300 persons, and yet, from the thickness of the walls, one family is rarely disturbed by noises in other rooms. In such large lodging-houses the stoves are heated from the corridor, so that the lodger has no trouble about tending his fire. As in the hut of the peasant, the aperture for the escape of smoke is, at a certain state of the fire, stopped, so that no more heat shall escape into the cold air without. In the better class stoves there is a kind of valve in the pipe forming the chimney which, by being closed,



shuts off all connexion with the outer air and keeps in all the heat.

Beyond these, again, there are fine brick buildings of two stories high, built to accommodate the better class of *employés* in the Government service, bankers, merchants, and others whose means enable them to attempt style and display. Each story contains fourteen or more rooms, of which the front rooms are all connected by folding doors. The floors are all inlaid with oak; the smaller rooms are so arranged as to be heated by one stove for each two, while the grand *salons* are warmed by two stoves each.

But the general taste of the wealthy Russian leads him to affect a style of life incompatible with living in flats. In this case the construction of the house is very peculiar, the reception-rooms being all on one floor. The windows in this case are very high, and the rooms lofty, so that the frontage gives the idea of there being only one story in the building, but the back rooms are low to make room for a series of still lower bedrooms built above them. Everything is often sacrificed to display, and while the dining-room, ball-room, saloon, cabinet, drawing-rooms, and boudoir, are as magnificent as imagination can very well conceive, the upper apartments are low, poor, and mean.

A great point is always the reservation of a spacious room as an entrance, where overcoats, fur coats, goloshes, &c., must be deposited before the visitor is announced to the "barin." In this ante-chamber one or two lackeys generally sleep on benches, which contain their clothing, &c., like lockers on board ship. As a rule no special provision is made for servants unless there be out-houses, in which they manage as they best can. In most good houses the kitchen is built in a wing or side office, into which the mistress of the mansion never penetrates. The great number of these long buildings takes up much of the ground of Moscow, and the more so as they stand in courts (*dvor*), which form an institution in Moscow.

The *dvor* is either in the front or at the rear of the house. It contains several smaller houses, nowadays let out to tenants, which were in the old days the servants' quarters. Even now the kitchen is usually apart from the house in the court, to avoid the disagreeable odours which will issue from the best regulated kitchens. Most of these houses are still built of wood (beyond the prohibited radius), and coated over with stucco, so as to look very imposing. Of course, such a structure, involving so much waste of land would not be possible in a town where land was very valuable. The houses are called by the name of the owner, and a person living in a lodging for which he pays rent, is written to with the name of the actual proprietor (where we should give the number in the street), as part of his address.

The grand houses of the more important nobility are enormous palaces, and in these the corridor of the second class of house described before is replaced by a grand reception-hall, on each side of which large folding-doors lead away to the drawing-rooms, library, cabinets, dining-rooms, billiard-rooms, &c. From this grand hall the stoves are heated, the faces of which are turned to the rooms referred to. In the grander suites of apartments in imperial palaces (in the Kremlin, for example), room follows room in a seemingly endless vista, while the apartments for attendant nobles remind one oddly enough of the partitioned *kvartere* of the lodging-house referred to on the previous page. Of course this does not apply to the high officers of state, such as the Lord Warden of the Kremlin, or the Commandant of Moscow. The Police Master, the Governor-General, and others have separate official palaces constructed in the manner above indicated.

The extreme cold renders a precaution necessary with regard to windows which is unknown to us. They are not only double, with a space of from 3 in. to 8 in. between the external and internal frames, but they are fastened up and secured with putty on the approach of winter, so that not a breath of air can ooze in through cracks and crannies. Communication with the outer air can be made by means of little trapdoors let into each frame in the corresponding panes, but these are rarely opened, and are not of necessity in every room.

The grandest of these imposing structures in the great towns of Russia are certainly the schools, and, whether for boys or girls, the gymnasiums surpass all the other public or private

edifices of Moscow, and are equal to most in St. Petersburg. In both towns the schools for foundlings are immense institutions, constructed on a plan reminding the spectator of such edifices as Greenwich Hospital, at least as far as size is concerned.

The desire of having an equal temperature throughout a dwelling would naturally point to building in flats, and the further consequence is the construction, in the great palaces of the Crown, of immense series of magnificent chambers leading one into another like the rooms in the galleries of the British Museum.

For domestic purposes the stove of an average Russian dwelling is the perfection of heating. No dust, no dirt, no smoke, no trouble of "keeping up," and above all an equal degree of warmth throughout.

Russian architecture is a study in itself, and would lead far beyond the limits of this article, but it may be observed that the mixture of a heavy low arch, sometimes Saxon, sometimes almost what we are accustomed to call Moorish, supported on short, thick, tub-like columns, with what we suppose must be regarded as Byzantine capitals, produces a strange effect. The arch is often double, but without the supporting centre column which we should be led to expect, and the tub-like, or skittle column, is found in the older churches, monasteries, and parts of the Kremlin. In one of the grand courts of the Kremlin the façade of the palace is broken by long slender columns between the tall narrow windows, the shafts of which are ornamented, not with fluting, but with elaborate foliage carved with extreme regularity and beauty.

But the most striking feature in Russian architecture is the church, the domes of which are either richly or gaudily painted blue, green, and red, and are invariably surmounted by the Greek Cross issuing from the Crescent. This symbol, by the way, is not emblematic of the triumph of the Cross over the Crescent, but of the birth of Christ from the Virgin, whose emblem is the moon. The form of a Russian church is always the same; the style of decoration differs with the means or taste of the parish or proprietor, but the form is always the same; and whether the dome be gilt, or simply coloured, the cross, crescent, and supporting chains are invariably gilt. In the case of the churches the system of heating from the centre is departed from, and stoves are introduced in the corners of the building. Monasteries are generally built of brick; they are surrounded by a wall with the peculiar Russian battlements, and, below these, machicolations. The curtain is flanked, at regular intervals, by massive towers with few and narrow apertures for bow shots, or the passage of light; they are invariably machicolated. There can be no doubt that the Russian dome is the best form for throwing off snow.

#### THE UNITED ARTS GALLERY.

THE promoters of this exhibition have called attention to it, as an exhibition of international character, and representing artists who are not well known in England; but we cannot come to any conclusion very different from that which we expressed in regard to the first exhibition last season, viz., that most of what is really good in it is by painters already well known here and represented in other exhibitions. There are a few exceptions in this respect in the present exhibition, it is true. The works by Mr. Welden Hawkins, a painter who seems to be by birth an Anglo-German and by artistic choice and residence a Frenchman, certainly possess a claim to an originality which gives them some importance, but it is an originality of very doubtful order, and if the position which we are told, Mr. Hawkins has gained in the *Salon* and among Parisian artists was gained by paintings such as these, this only shows that eminence in French art is more easily gained than it once was. Mr. Hawkins appears to be a member of the sect of the "Impressionists," and paints the tones or colours of objects with no attention to detail or texture. For a painter to make an impression in this way he must have a keen perception of tone, which Mr. Hawkins appears to possess; and there is remarkable effect of light in his largest picture, "Derniers Pas," as well as some character and pathos in the figure of the old woman with her back to the spectator, painted as it is with heavy blotches of colour without the slightest attempt at giving the texture or detail of the costume. What painting on this principle may

come to is shown in the same artist's smaller work, "The Flowers that soothe a Grief unhealed" (127), where, in the middle of a landscape, which all resolves itself into sameness on close inspection (the tones are pleasant) is a figure whose face is a blotch of paint with no features, and whose ankles beneath her frock are apparently represented by two other indistinct blotches in such a position that, if these said blotches do represent the limbs, the figure could not maintain her balance for a moment, but must fall over on her right side. To put forth work of this kind as important painting is sheer affectation; there is a certain cleverness about it, but it is a kind of art which is thoroughly unconscious. The large work by M. Bastien-Lepage, "Pauvre Fauvette," which is a sweet and pathetic figure of a little cow-keeping girl in a poorly-painted landscape, is a work not before exhibited, and is of some importance considering the position which its author has now attained; but we very much question whether this painter will ultimately take the position which his admirers are at present disposed to give him. He has talent enough for almost anything, but he seems to be a painter who is adopting in a self-conscious manner, and for the purpose of making a style, the simplicity and naïveté in the representation of peasant life to which Millet was led by a natural untutored impulse, and that here also we meet with that bane of so much recent art, affectation and the assumption of an artistic "pose," so to speak, which is the great sin of our "Governor Gallery" contributors, with all their ability. Among works of less ambitious pretensions, Mr. Yeend King's "A Rent Question" (121), a landscape with figures, is the best work we have ever seen by that painter. Herr Von Molitor's "Defeated" (194), an interior with figures, is an admirable work in a fine broad style of painting, very badly represented by the scratchy sketch in the illustrated catalogue. "Arrival of the Fishing Boats at Dieppe" (225), by M. Gilbert, is a very good work of the "coast-scene" class, one or two other works by the same hand are equally good; the shipping and the figures are alike well drawn and interesting. M. Delobbe's "The Winnower" is another good work, a single figure of a peasant woman; and there is a fine example of Munthe's well-known snow-scenes. There are, however, but a few of this higher type among a large majority of paintings, of which many are commonplace, and some too bad and vulgar to be worth hanging anywhere, and the exhibition only seems to prove, as already observed, that we are familiar in England with the best Continental artists, and that the new names that are brought before us here have mostly nothing to give us nearly equal to what we have had from artists with whose names and reputations we have long been familiar.

The committee issue an illustrated catalogue, concerning which they quote a critical opinion to the effect that as regards printing, paper, and illustration, it is "quite exceptional." This, we feel bound to say, is not the case; it is nothing like equal either to the *Salon* catalogue or to that of the Royal Society of Water Colours; and we object very much to the foolish affectation (carried out also in some other "aesthetic" quarters) of making the book up with uncut leaves of various widths, thus increasing threefold the trouble of turning the pages and finding any particular number that may be wanted,—all this inconvenience being caused for the mere sake of following a fashion.

#### THE HAMILTON PALACE COLLECTION.

FAMOUS and important as are the collections that season after season pass through the familiar rooms of Messrs. Christie & Manson, in King-street, it is not often that a gathering of treasures such as that of the Duke of Hamilton has to be dispersed under the hammer. Sales there are and have been of choice possessions,—sales like the San Donato, the Soulaiges, and many others that might be mentioned,—but the scattering of a collection with so marked a character as that of Hamilton Palace can alone be compared to the famous Strawberry Hill sale of just forty years since, when day after day for hard on a month Mr. Robins, of Covent Garden, knocked down lot after lot of Horace Walpole's wonderful gathering of bric-à-brac. Time and taste have changed since then, when the very nomenclature of the objects was a mystery to



the catalogue compilers. Both in France and in England, within forty years, there has been an advance in knowledge,—only another form of taste. The equally wonderful collection of M. du Sommerard, which now forms the well-known Museum of the Cluny, was purchased by the French Government from its original owner, and thrown open to the public only a year after the Strawberry Hill sale. The result has since been described as "a sudden and complete revelation"; a few years later, in 1856, M. Sauvageot presented to the French nation the wonderful collection of objects he had so patiently gathered, and which now forms one of the glories of the Louvre. A year later our own South Kensington Museum was founded, since when every one interested in art has had it within his power to make himself familiarly acquainted with almost every branch of art that mankind has created; the most distant corners of the earth have been ransacked for antiquities, while the sale-rooms of Paris, London, Vienna, Berlin, Brussels, and New York have season after season poured into our houses myriads of objects that a new "taste,"—of late years intimately connected with the social aspirations of a large number of persons,—has, it would seem, positively created. By that accepted commercial axiom that, wherever there is a demand, a supply must be found, the collectors of curiosities have had their desires amply satisfied, during the early years, with genuine objects which have now long since become scarce, but have been skillfully replaced by clever imitation.

It is the peculiar interest attached to sales such as that of the Hamilton Palace collection that the objects composing them were all, except the pictures, gathered at a period when the imitative skill of the present day was not alone unknown, but unnecessary. In those happy days it was the few alone who appreciated the marvels of the patient past, and how can we sufficiently repay our debt of gratitude to such storekeepers without whom the revival of the lost traditions would be impossible, which now by the aid of the collections we possess and owe to their appreciative care, so studiously an endeavour has been made to restore. The true taste of these collectors was shown in appreciating what they found those about them overlooking, uninfluenced by fashion, they saw and understood the merit of the work which now we have learnt to respect, and for which governments and choice collectors find no valuation too high.

The Hamilton Palace collection cannot, of course, be said exactly to consist of what is generally understood as bric-à-brac. The collection was not formed in any of the spirit in which such gatherings are usually made. It is, as every one now knows, the princely collection of many generations, and bears that stamp, imperfectly as the objects can be seen in Messrs. Christie's scarcely sufficiently ample rooms. The objects chiefly belong to the palatial period of decorative art,—to the grand siècle, and its scarcely less showy successor. It is no bourgeois art suited for the crowded and cramped dwellings which we now seem to delight to inhabit; it belongs to a period when all was grand, when the huddle of our modern receptions would have been sadly out of place with the grand air and fine costumes, when apartments were large enough, and were purposely so designed to enable the guests to picturesquely group themselves and freely move about. It was not a glorious period of art, we shall of course be told, however brilliant from a political and literary point of view, but the creations of the artists of the time bear, it cannot be denied, what is so sadly wanting in our work in the present day, a marked character of their own.

The collection of decorative objects which compose the Hamilton sale is, perhaps, as representative a gathering of work as it would be possible to see brought together. The first of the five portions into which the collection is divided, and composed of the Dutch and German pictures, and a number of choice pieces of furniture and decorative objects, was disposed on Saturday, Monday, and Tuesday last. The interest connected with the pictures may be judged when it is remembered that many hold an historical position. The very large Rubens "Daniel in the Lions' Den," which, from a letter written by the painter to Sir Dudley Carleton, we have full assurance, is entirely by Rubens's hand,—"*Tutto da mia mano*,"—cannot be said quite to deserve the reputation it bears, and is singularly calculated

to puzzle those who may be familiar with the magnificent "Lion Hunt," one of the superb Rubens's in the Munich Pinakothek,—a work also stated to be entirely by the master's hand, though Snyder's aid is sometimes suggested. The charming portrait of Rubens's first wife, Elizabeth Brant, is in the painter's happiest manner, while the copy of Velasquez's portrait of Philip IV. we can well understand, as we are told, the painter kept always by him as a model of thoughtful portraiture and solid execution.\* A thorough Rubens subject, the "Loves of the Centaurs," and two *grisailles*, are worthy of mention,—one a design for a salver for Charles I., the second, the portrait of the Duke d'Olivarez, the favourite minister of Philip IV.,—a work rendered familiar by the engraving of Pontius.

Several Van Dyck portraits further composed this first portion of the sale, but none of any extraordinary merit, among them the portraits of the Duchess of Richmond and her son. Several inevitable portraits of Charles I., and a charming sketch of Henrietta Maria, a superb Hobbema, a Van der Velde, two Steenwycks, of wonderful minuteness; Rembrandt, Brauer, Teniers, and Ostade were also not ill represented. The Dirers were unquestionably disappointing, the portrait of the painter especially so to all familiar with the exquisite works at Munich and at Florence. The full-length panel portrait of Edward VI. by Holbein was certainly one of the most interesting pictures of the exhibition.

Whatever disappointment may have been felt respecting the Dutch pictures of the Hamilton collection (the chief treasures of which belong to the Italian schools), the extraordinary pieces of furniture amply compensated. They are such as do not every day come before the public,—relics, indeed, of regal magnificence, it is alone in palaces that treasures such as these are to be met with. Historical cabinets, the work of famous artists, such as André Boulle and Riesener, adorned with gilt bronze chasings by Gouthière and Anguste, works in which are embodied all the splendours of Versailles and the delicacies of the eighteenth-century French court of the Du Barry and Marie Antoinette. The several specimens of Louis XIV. Boulle (or Buhl) work disposed of, were magnificent specimens of the cunning artist's work in ebony, brass, white metal, tortoiseshell, and ormolu, and offered a singular contrast in their low-toned richness of colour to the gaudy imitations which are so painfully familiar to the connoisseur as "Buhl" work. The so-called d'Artois cabinet, thought it has had some questionable additions made by its subsequent historical possessors, is a superb specimen of "Buhl" work only surpassed by the other pieces, such as the knee-hole writing-table and pedestal cabinet.

During the three days that the objects were on view, there was always a crowd round the interesting Louis Seize secrétaire, with its curious decoration of fan-paintings and lace; with its equally decorated interior; it is precisely the secrétaire on which one would have pictured the frail Du Barry,—to whom it belonged,—delighting to indite her tender *billets-doux* to her royal lover. The secrétaire made for Marie Antoinette by Riesener, who has proudly signed his name, in ink, at the lower corner of the work, with the date 1790, and adorned in the centre with a richly chased subject by Gouthière is scarcely less interesting, and in reality far more beautiful than the Du Barry secrétaire. Poor lady, this present, with the accompanying commode or chest of drawers,—signed also by Riesener, 1791, was among the last she was to receive; two years later, it will be remembered, the queen saw her husband carried to the guillotine. Delicate creations, the *à plus ultra* of the cabinet-maker's art, the Duchess of Hamilton's drawing-room (from which these pieces of furniture came) will sadly miss such speaking relics of an unhappy court. The oblong writing-table, (which belongs to the same suite and which was exhibited at the South Kensington Museum in 1862), inlaid with its trophy of flowers and companion medallions round the sides, is a positive marvel of skill. Delicate as are these works, they keep well their place beside the more grandiose creations of the earlier periods, the bronze gilt tables, with their huge tops of

\* The work is mentioned in the inventory of Rubens's effects, made on his death.

+ This is the correct spelling of the name applied to work which, we know not how, is universally known in England, and printed so in the Hamilton's catalogue, as "Buhl."

antique Egyptian porphyry and granite, on which group themselves so naturally the rare Oriental vases,—some among the largest in Europe,—and the ormolu clocks and garnitures. The Louis Seize clock by Krible in its lyre-shaped case of Sèvres *gris-bleu* porcelain and ormolu, and pendulum adorned with fine old pastes, as also the Louis Quinze clock by Robin with its chased ormolu allegorical figures of Sculpture and Architecture, deservedly attracted during the show much attention. A whole suite of marquetry chairs, with the arms of the Hamilton family inlaid in the backs, two of the Italian "Tudor" chairs, decorated in low relief, said to have belonged to Cardinal Wolsey, a quantity of the rarest Japanese gold lacquerware, a large and superb oblong chest of black lacquer adorned interiorly and exteriorly with raised subjects in gold (once in the possession of Napoleon I.), the almost more than choice collection of Chinese enamels and agate and jade carvings, complete the wonderful gathering of objects which formed the first portion,—a fifth only of the whole collection,—of the Hamilton sale.\*

#### A TUNNEL UNDER THE ST. LAWRENCE.

UNDER the great stream of the St. Lawrence, near Montreal, it is intended to carry a tunnel connecting a line of railway on the north with one on the south side of the river. The length of this tunnel will be fully 15,000 ft. The deepest point of the tunnel gradient will be 170 ft. below the level of the river banks. The tunnel is to be completed within three years. The contractor, Mr. Roillard, of Montreal, has undertaken to execute the work for \$3,905,000.

#### BRINGING THE SEA TO MANCHESTER.

THE proposal to render Manchester a seaport town is one of so bold and startling a nature, and the influence of the scheme, if carried into effect, on the manufacturing and commercial industry of the most densely peopled part of England will be so extraordinary, that a large number of our readers will probably be thankful for some further definite information as to the little known physical conditions of the case. The promoters of the undertaking appear to be thoroughly earnest. They have published a small pamphlet, entitled "The Proposed Manchester Ship Canal, Facts and Figures in favour of a Tidal Navigation to Manchester," which is full of detailed and valuable information as to the commercial aspect of the undertaking. They have cited our own remarks on the subject of the displacement in various industries, which is now so rapidly taking place, in pursuit of spots attainable by water carriage; paying a tribute to the Builder, for which we have to express due acknowledgment, as "a journal well known for its clear and trenchant articles on questions affecting transit." And the facts which they cite are so numerous, so important, and so soundly based on statistical information, that it is hardly possible to condense them more compactly. Those of our readers who desire to know what is the actual state of the trade of Lancashire, Cheshire, Derbyshire, and Staffordshire should read the little pamphlet.

With regard, however, to the physical conditions of the case, the pamphlet is almost entirely silent. It mentions the fact that the level of the river Irwell, at a place called Throstle's Nest, is 61 ft. above the sea level, but does not state whether high water, low water, or mean tide level is referred to. The vertical range of the tides at the port of Liverpool, on the average of the springs, exclusive of the equinoctial tides, is 27 ft. 6 in.; the level of low-water being 8 ft. 8 in. below the datum level of the Old Dock sill. It will be of all the more service, to the scheme itself, if it be a sound one, and to those who may be disposed to support it, if otherwise, to inquire a little into the engineering features of the case, from the fact that the works which

\* Rubens's "Daniel" realised the enormous sum of 5,145*l.*; the portrait of Elizabeth Brant, 1,837*l.*; Philip IV., 588*l.*; the "Loves of the Centaurs," 2,100*l.*; the two *grisailles* respectively, 1,684*l.* and 472*l.*; the portrait by Vandeyck of the Duchess of Richmond, 2,042*l.*; that of the Princess of Palatinate, 2,100*l.*; that of Henrietta Maria, 736*l.*; the Hobbema, 4,252*l.*; the Van der Velde, 1,345*l.*; the Brauer, 609*l.*; the Ostade, 1,837*l.*; the Direr portrait, 388*l.*; the Holbein portrait fetching only 786*l.* The furniture and porcelain realised also very high prices, the cabinet, 766*l.*; one pair of *gris-bleu* oviform vases reached 1,680*l.*

\* See Carpenter's Vandyck.



have been so successfully carried out in the Clyde and in the Tyne are referred to as precedents for effecting a tidal navigation of the Irwell. The cases, however, are so dissimilar that only mischief can result from representing them as identical.

We may at once admit that as far as the industry of a great manufacturing centre, such as Manchester, is concerned, it is a matter not only of local, but of national, importance, that the cost of transport from the holds of merchant vessels to the factory, or to the warehouse, should be reduced to the lowest possible figure. The cost of transport from the sea to an inland town, whatever its amount, is a tax upon the industry of that town, which it is important to lighten as far as possible. The question, however, is a very grave one, in what manner that diminution of cost is most certainly to be effected; bearing in mind that in such a case as that before us it is not only the 709,000 inhabitants of Manchester and Salford whose interests we have to regard, but the 5,500,000 inhabitants within a radius of forty miles from that great industrial capital.

Next, it may be admitted, and indeed ought to be generally known, that although Manchester may justly claim the title of the cradle of the railway system, it has been served by its gigantic nursing, much as the hospitable hedge-sparrow is said to be served by the ungrateful cuckoo that it has hatched and reared. The prosperity of Manchester is being devoured by the railways. One or two of the numerous facts brought in evidence before the Select Committee on Railway and Canal Charges leave no room for doubt on this score. There are eight distinct lines of communication between Manchester and Liverpool, viz., the public highway, two canals, and five railways. But the railways have combined, they have controlled the canals, and established a rate of charges so high that it is actually possible (incredible as it may seem) to send goods by road to and from Liverpool at 25 per cent. less cost than by railway! Any one who doubts the accuracy of this statement is referred to the evidence of Mr. Spence, of Manchester, before the Select Committee on Railway Rates, which will be found on page 473 of the Report (No. 226, 1881). In fact, the railways now charge 7s. 6d. for an amount of transport for which, twenty years ago, they charged 2s. 6d., and which could be performed by canal for 1s.

As an example of these charges we find in the appendix to the Report that from Runcorn to Chester, a distance of fourteen miles (226, i. 1881, p. 85), the London and North-Western Railway Company charge 8s. 4d. per ton "ex labour," for the carriage of round timber. This is equal to 2jd. per foot, and, allowing for conversion, to more than 8d. per foot to the builder, measured in his work, a very fair profit. Carried by canal, also "ex labour" of loading or unloading, for an equal distance, the cost would be less than 6d. per ton. It cannot be denied that Manchester comes before Parliament with a fair claim to be delivered from such intolerable oppression.

The question, however, of the best mode of doing this is not so simple. Water carriage to Manchester is now effected, or it would be more true to say not effected, by two routes. Of these the first is the Bridgewater Canal, which has been justly styled "the father of British inland navigation." The first Act of Parliament under powers of which this undertaking was commenced by Francis, duke of Bridgewater, is dated in 1759, the object being to supply Manchester with coal from the duke's collieries at Worsley. Under an amended Act, dated in 1760, the whole canal from Worsley to Manchester, with extensive subterranean works at the collieries, was executed. These underground canals and tunnels were eighteen miles long, and cost 193,000l. By powers given in subsequent Acts, the line was continued to Preston Brook, where it joins the Trent and Mersey Canal, and to Runcorn, where it falls 82 ft. into the Mersey, by ten locks. The total length of the Bridgewater Canal, between Runcorn and Manchester and Leigh, is 39 miles, 6 furlongs. There are fifteen locks, of an average fall of 7 ft. 4 in., each 84 ft. long, and 15 ft. wide. About 1,080,000 cubic feet was the maximum quantity of water taken in one day of twenty-four hours. The proprietors refused in 1870 to make any return to Parliament as to the traffic or receipts; but if all the water taken went as lockage it would allow for the passage of 180 boats per diem. The exact cost

of the canal is unknown. There are heavy works on its line. In 1831 it is stated that it yielded an income of 260,000l. to the proprietor, the Marquis of Stafford.

The second waterway from Liverpool to Manchester is formed by the Mersey and Irwell Navigation; the first Act of Parliament for which was obtained in 1720, and amended in 1794. This Act authorised the "making the rivers Mersey and Irwell navigable from Manchester to Liverpool." It gave power to certain persons, described as undertakers, to scour and cleanse the rivers, to make cuts and branches, and to build locks, sluices, and weirs. In return they were entitled to demand a tonnage rate of 3s. 4d. per ton for all merchandise conveyed between Bank Quay and Hunt's Bank in Manchester. The length between the termini is stated as fifty-seven miles. In the Parliamentary return there are seventeen locks, 82 ft. long, 15 ft. 6 in. wide, with a fall of about 8 ft. 6 in. each. All the flow of the rivers is used for the purpose of navigation. The proprietors refused in 1870 to return to Parliament their tonnage or income.

"Commencing on the west side of the town of Manchester, at 93 ft. 3 in. above the level of the sea, the Irwell takes a very sinuous course to the west, passing Chat Moss, and uniting with the Mersey after having left Flixton House to the east." Near Warrington there is a navigable cut, called the Mersey and Irwell Canal, which shortens the course. The whole rise is 70 ft. It should be observed that this statement, which is taken from Mr. Priestley's "Historical Account of the Navigable Rivers and Canals of Great Britain," shows that the number and rise of locks above given, which are taken from the Parliamentary return, do not give a correct idea of the total rise surmounted by the navigation. Mr. Priestley's section shows a flight of ten locks at Runcorn, for the Bridgewater Canal, and then a level formed for twenty-seven miles to the junction with the Rochdale Canal at Manchester. The fall of the Irwell into the Mersey takes place at Carrington, at 40 ft. above Ordnance datum. The Irwell, which rises at the Erewell Spring, on the borders of Yorkshire, 1,325 ft. above the sea, is twenty-eight miles long, and drains 312 square miles, inhabited, in 1861, by 1,014,569 people. It skirts Manchester, which covers 4,294 acres, for a mile.

It is evident from these facts that the attempt to make the Mersey and the Irwell rivers navigable for sea-going vessels is one of no ordinary difficulty. The length, stated at fifty-seven miles in the Parliamentary return of 1870, is said by Mr. Priestley to be reduced to about fifty miles by cuts; but the total distance, if the river ran in an even course around the considerable *détour* to the south, would be only forty miles. Ten miles at least is thus lost in bends and twists, which, however unimportant for a barge of 80 ft. long, would prove formidable obstacles to a sea-going vessel of five or six times the length. The tides now ascend to Woolston, which is stated in the pamphlet to be only about fourteen miles and a half from Manchester as the crow flies. But it is just in the course of the Irwell above Warrington that the loss of ground due to the windings of the river mainly occurs; and for this distance, according to the data before us, the excavation to the bed of the canal will range from 62 ft. to 85 ft.; while the low-water tidal level attained by the excavation will be 93 ft. below the level of the Bridgewater Canal at Manchester. These are stubborn and very serious facts. The problem involved is to cut a ship canal, as regularly as can be done, to replace some thirty miles of winding river,—the section of the ground being as above indicated with reference to the water level. Such a cut, if effected, will be quite without precedent. The twelve miles of the improvement of the Tees, the fifteen miles of the improvement of the Tyne (as high as Blaydon), and the twenty-one miles of the improvement of the Clyde, while they have deepened the channels of those rivers so as to allow of the ascent of vessels drawing 20 ft. of water, have not affected the high-water level at Stockton, at Newcastle, or at Glasgow, by more than a few inches. To sink the water level at a given point by 61 ft., to dig a bed for a depth of 22 ft. below that level, and to keep the channel clear when formed, are matters as yet unattempted.

We trust that the enterprising merchants and manufacturers of Manchester will insist on having these engineering points made clear

and plain before they finally commit themselves to so serious an undertaking. We feel the more bound to give this caution from the reference made in the pamphlet to the cases of the Tyne and of the Clyde, which, as well as that of the Tees, we have shown to be wholly irrelevant. Nor is the cutting of the canal the whole of the affair. Dock accommodation must be provided in order to render the canal of any use when made. The experience of Liverpool, as well as that of Glasgow, points to the rule of allowing from 50 acres to 66 acres of wet dock for every million tons of shipping. At Liverpool, where the tonnage of vessels in 1881 amounted 7,893,948 tons, the area of the wet docks open, or in course of construction in 1878, was 525 acres, with a lineal quayside of 33 miles, and Liverpool is at this moment crying out for want of dock space for its trade! In Glasgow, in 1881, it is stated in the pamphlet above cited, that there were 153 acres of harbour, for a total tonnage entered of 3,057,533 tons. The excavation of wet docks to a depth of 80 ft. and more beneath the surface, and the construction of roads and approaches, is a colossal task. Acre for acre it must cost much more to purchase land and excavate docks at Manchester, than it has done to reclaim dock area from the Mersey, or its shores, at Liverpool and Birkenhead. When to this we add the cost of raising the entire tonnage imported by as much as from 80 ft. to 100 ft. from the new quays to the streets of Manchester, it is clear that even bringing the tidal flow to Hunt's Bank would by no means free the traffic from serious cost.

How far the projectors of the canal feel themselves in a position to take possession of the channel of the Irwell, with or without the assent of the Navigation Company, we have no hint given by the promoters of the ship canal. A long experience of Parliamentary warfare does not lead us to judge that this will be altogether plain sailing. But when we weigh maturely the fact of the levels, when we look at the long level obtained by the Bridgewater Canal after ascending its great water ladder at Runcorn, when we look at the sinuous course of the Irwell, and measure its fall and its flow, we cannot help suggesting that it might be a safer as well as a more economical plan for Manchester to set her shoulders to the task of opening and improving, or, if necessary, duplicating, the existing route for a well-ordered canal navigation, than to attempt, at least in the first instance, the larger task. With the two canals free and open, we think transport would be effected from the sea to Manchester in as cheap a mode as can be desired. It may be said that the dock dues and town dues of Liverpool come to nearly 2s. 6d. per ton on shipping. True. But a Manchester dock, being more costly than a Liverpool dock, would ultimately prove heavier in its charges. It may be said, and said with truth, that it is one thing to ask, and another to obtain, and that the two canals, the owners of which refused to make returns of the traffic to Parliament in 1870, are under the control of managers with whom it is impracticable to make terms. But would it not be in the power of these people to make a much more effective opposition to a scheme for lowering the whole channel of the Irwell to so great a depth, than to any well-organised effort for compelling them to do what Parliament gave them powers in the trust that they would do? \*

We take the warmest interest in any noble public work. We are convinced of the extraordinary value of the improvement of tidal rivers. The tonnage of the Clyde was 732,327 tons in 1831. It was 3,057,533 tons in 1881. The tonnage of the Tyne ports rose from 3,196,781 tons in 1861, to 5,968,886 tons in 1881. But the question, on which we do not pretend to form a judgment, but on which we wish to see a good deal more light thrown than at present is visible, is, will such a wide and deeply sunk cut form really the best and cheapest communication between the sea and Manchester? As at present advised, we doubt it. And even if it were so for Manchester herself,

\* Since these lines were written, the publication of the draft reports of the Committee on Railway Rates shows that both the majority and the minority of that committee recommend that the Railway Commission shall be empowered to meet through rates on canals, notwithstanding any arrangements to the contrary, and to enforce the same, to the abolition of charges used in order to impede canal transport. If this be done, Manchester, by following our suggestion, will at once command the cheapest mode of transport from the sea (subject to further improvement), without having to enter on so serious a Parliamentary struggle as the project of a low-level canal would certainly originate.



how for the 5,500,000 of population within a radius of forty miles? Rather, it seems to us, if Liverpool be unreasonable, take advantage of the rising activity of Garston,—rather utilise some of the sandy estuary of the Mersey, which, between Oglet and Ellesmere Docks, is three miles wide. Rather follow Brindley's lead, and make a second Bridgewater Canal, with its long level pond, attained by a high flight of locks, and thus carry to Manchester, as you will carry further inland through and from Manchester, than attempt to turn an inland capital into a seaport, without much more distinct proof, not only of the feasibility, but of the economy, of such an enterprise, than as yet we have seen,—we will not say to be offered, but to be dreamed of as requisite.

Our one object is, that Manchester should have the cheapest and best mode of communication with the sea. It is as possible to ascertain what that would be, regarded as a scientific question, now, as after spending tens or hundreds of thousands of pounds in Parliamentary contests. What we urge, therefore, is simply this. Let Manchester take the best advice on this vital point.

#### THE OAK IN HISTORY, ART, AND HANDICRAFT.

The oak in literature, art, and handicraft would form a delightfully instructive monograph. Indeed, confined to any one of these departments, the oak and its useful varieties and belongings would furnish ample materials for treatment poetically, artistically, and constructionally. We might begin with Moses and the prophets, or Homer, and not end with Evelyn and Sir Christopher Wren. Our purpose, however, is not merely to pile up heaps of acorns or stack sheaves of oak prunings and cuttings, but to illustrate our subject with some of the best examples and applications that the minds of the ages afford in relation to our theme. The oak symbolises, or has been made to symbolise, much by the common consent of mankind, and its literature, after 6,000 years, is a still welling and refreshing fount, not only of poetic inspiration but artistic suggestiveness. Fecundity, tenacity, durability are illustrated in its growth as a tree, and strength, with versatility of application to artistic and economical uses, as a plant and a timber. Throughout the books of the Old Testament there is frequent mention of the oak, both in respect to worship in groves of these trees, as well as in regard to some of the earliest uses of the oak as a symbolical plant or a convertible timber for economical ends and purposes. It would scarcely serve any practical aims to enumerate in detail these Scriptural allusions, but their indication as we pass on may suggest to other writers a useful subject for research,—students, for instance, in Biblical archaeology. In these Scriptural allusions to the oak, it is, after all, difficult to conclude whether the words in many cases are used metaphorically or literally, or whether trees, or men of the qualities or characteristics of the oak, are to be understood. At the same time, the historic facts remain, that the oak was an important plant and timber from the earliest date, and has so continued through every change of society and manner to our own times. Not only in connexion with building, but with shipbuilding and other crafts, do the Biblical writers deal. The ships of Turkish and the oars of the barks of Tyre are clearly spoken of; but, according to Ezekiel, the oars of the latter were made of the oaks of Bashan. Some of our translators have rendered it fir, but it is well known that the region of Bashan beyond the Jordan was celebrated for its great abundance of oak-trees. But we must not be tempted to note the frequent allusions to the oak and the incidents with the tree in Scripture from Genesis onward.

Coming to profane history, ancient writers mention four species of the oak in Macedonia; north of Greece the whole country was celebrated for its oaks, and those Chaonian acorns, of which special mention is made,—*Chaonici patres glandes*,—were the produce of Epirus, which was ornamented by the woods of Dodona. Pliny may be consulted for sundry interesting allusions to the oak. Civic wreaths or crowns were made of this plant, and students of classic history are aware of the estimation in which these wreaths were held. Before the harvest, husbandmen performed the rites of Ceres, crowned with oaken chaplets. In the Eleu-

sinian mysteries, boughs of oak were carried, and wreaths of oak worn at the feasts were intended to commemorate the time when agriculture commenced. The oak was worshipped as a divinity out of respect to the original food of men. The Greeks were wont to swear by the oak, and betimes by the shade of it. A Greek proverb expressed age and experience when it spoke of such-and-such a man having eaten of the acorns of Jupiter. As to acorn food, Lucretius has it,—"*Glandulas inter curabant corpora quercus*." Boughs with acorns carried in marriage ceremonies were emblems of fecundity; and Heato is described by Sophocles crowned with oak-leaves and serpents.

In accepting the Mosaic account of the creation literally, as regards man's entrance into the field of worldly life and labour, it seems remarkable how comparatively soon he was enabled to make a choice of materials for the most fitting ends and purposes. Choice in the region of practical wants naturally occurs through comparison and experience of what has been used before. This is particularly the case in connexion with the arts and handicrafts. Men use what their predecessors have used and found to answer. At a very early date in the age of the world, we find that the oak, the cedar, and some other timber-trees were selected for sundry artistic and handicraft uses. The selection of certain oft-mentioned woods need not be the result of any inspiration or even intuitive perception on the part of the early dwellers upon earth in Biblical times. If the chief personages whose patriarchal ages are recorded in Holy Writ lived the full term of years literally put down to them, it must be granted they had in most instances ample time, indeed, to know the building and other qualities of the oak and other woods; for many of the patriarchs must have long outlived the oak and the cedar. Apart in many matters, we find from the earliest time a good choice was made, and the industrial substances and materials chosen still obtain in one form or another after thousands of generations. In the early implements of husbandry and agriculture we find the wood of the oak was pressed into service. The handle of the primitive plough, as described by Hesiod, was made of common oak, and the share-beam of the evergreen oak. In the plough of Virgil, however, we have the handle of elm. In our modern British plough,—that is, before the introduction of the iron plough,—oak, ash, and elm, and, indeed, other woods, were used according to local circumstances and resources. The relative durability of the oak and larch is mentioned by Homer, and in modern times we find the Old Masters divided in opinion in respect to the most fitting wood for their art purposes. Both the Flemish and Italian schools painted upon tablets of wood. Raffaele, it would appear, preferred the larch. We have examined some of those old painted-upon panelings, and, where large, they appear to have been well jointed (from a back view), and where not clamped or secured at the ends, had otherwise their widths tongued or dowelled together. We have also examined some very old large screens, the material painted upon being oak of dark colour, the paintings in one or two instances being attributed to an Old Master. Here, too, the jointing appeared as good as could be wished, and in general characteristics the wood workmanship was like the former.

In quoting Vitruvius we may cite him in connexion with Evelyn, who advises the industrious in "*Sylva*" to consult the whole tenth chapter of the second book of the old architect in respect to the growth of the oak and the quality of the climate best suited to its cultivation. Very hot, or excessively cold, climates, according to our authority, are not conducive to the prosperity of the tree. Evelyn himself was of opinion that while the Venetians had excellent oak, neither that of Norway, Denmark, and other places mentioned were comparable to English, or, shall we say, British oak. Evelyn is enthusiastic in his allusion to the oak as well as to other native trees; and if it be desired to quote some well-known Classic authors at second hand, it may be done through the pages of the genial author of "*Sylva*." "To enumerate now," says this writer, "the incomparable uses of oak were needless; but so precious was the esteem of it, that of old there was an express law amongst the twelve tables concerning the very gathering of the acorns, though they should be fallen in another man's ground." The ancient shipwrights or barque-builders did not invariably

build their vessels of oak, but often selected fir, beech, and alder. For piling and foundation purposes, and for uses under water, the oak was considered by ancient users and authors a most lasting timber. Theophrastus observes that the oak, buried under water, never decays, and that in rivers and lakes vessels are made of it; but he adds that in the sea it grows rotten. Strabo speaks of the ships of the ancients being built of oak; and Sophocles, in "*Philoctetes*," uses the term which may be translated as "oak-framed navy." We may have our doubts about some of the statements of Pliny in respect to natural history, but still he is entitled to be quoted as a Classic, if not always on the score of exact description. On the shores of the Caucasian Sea, according to this author, oak grew in the greatest exuberance,—"*Maxima aviditate nascendi*." These oaks, we are told, undermined by the waves, and propelled by the winds, carried off vast islands in their interwoven roots. And he goes on to relate the terror of the Roman fleet in their encounter with these floating islands. Here are, indeed, suggestions for geologists and hunters after themes anent early colonisation from East to West. Elsewhere Pliny speaks of the enormous size of the oaks of the Hercynian forest. The description is, indeed, more than enthusiastic. These gigantic oaks, to use his own words, "unaffected by ages and co-eval with the world by a destiny almost immortal, exceeds all wonder. Omitting other circumstances which might not gain belief, it is well known that hills are raised up by the encounter of the jostling roots; or where the earth may not have followed, the arches, struggling with each other, are elevated to the very branches, are curved, as it were, into wide gateways, able to transmit whole troops of horse." These must have been grand primeval forest oaks, in sooth, fit abodes for the mystic Druids, and their weird worship.

In Cesar and other authorities there are accounts of the extent and productions of this Hercynian forest. A modern naturalist, Ray, mentions an oak in Westphalia which served for a citadel. There is frequent mention of the oak, its associations and uses as a tree and a timber in British history from an early date. Shakespeare, who has scarcely left aught untouched, notices the peculiarities of the venerable oak still standing erect as monarch of the woods, though with crest leafless,—

"High top bald with dry antiquity."

Like the oak, in sooth, man shows the fulness of his years by withering atop. The great dramatist has immortalised the venerable tree of Windsor Forest (or perhaps a predecessor), known as "Herne's Oak." There are many historic British oaks, among them the Royal oak in which Charles II. concealed himself after the battle of Worcester; and, much farther back, the oak in the New Forest (or rather old forest), near which William Rufus was shot by Walter Tyrril. The Cowthorpe oak, which stood near Westerley, is engraved in Hunter's "*Evelyn*." This was a gigantic tree. Within 3 ft. of the earth, it measured 16 yards in circumference, and close to the ground 26 yards; its height was about 80 ft., and its principal limb extended 16 yards from the bole. The Greendale Oak, of Welbeck-lane, was another large oak in its prime. There are two views of it in Hunter's "*Evelyn*." At 1 ft. high it measured 33 ft. 1 in.; at 2 ft., 28 ft. 5 in.; and at 6 ft., 25 ft. 7 in. The Boddington oak, mentioned by the same authority, greatly exceeded the two former in dimensions. The central oak of a number was the peculiar object of veneration in the British islands in early times as well as in Eastern nations. In the Isle of Anglesey, the ancient Mona, from time to time, have been dug up great trunks of oak, supposed by some historians to be the relics of the holy groves of the Druids. In the Irish bogs whole trunks of oak trees are often excavated, not singly but in numbers, and also the trunks of yew and fir. A chemical action through the constituents of the bog has in process of long years changed the colour of the oak to a deep black. The raising of this bog-timber, through turf or peat-cutting operations, has for a number of years past given rise to new industries, and the application of the timber to sundry ornamental and economical uses. Of the three general kinds of bog timber found,—fir, birch, and bog,—the former is so impregnated with resinous material, or the natural turpentine of the tree, that a splinter



of it burns like a candle, and is used by the turf-cutters and peasantry for such. Indeed, the chemical changes effected in the submerged wood would point to its evolution in distant time in the form of bituminous coal. Bog oak ornaments in the jewelry and fancy trades have obtained for many years, and, with gold and silver settings, these articles of personal adornment have had a fair sale, particularly in the sister kingdom and America. A great variety of ornamental household articles are made out of bog yew and bog oak. We will not stop to inquire whether the bogs of Ireland were primeval forests. Their conversion from swamp or forest dates from an unfixed period, far back in the misty region of space. The Druids of Pagan Ireland, or those at the time of the introduction of the Christian religion, lacked not oak groves or forests for seclusion, council, or worship. England, too, for long centuries was a thickly-wooded one, and oak forests were plentiful. Before the introduction of coal, or rather before its use, the woods and forests were to a great extent despoiled, and the timber cut down for fuel. Valuable oak, as well as other native timber, suffered the common lot. Even after the advent of coal raising, but before its general use, our oak and other forest timber was made use of for smelting purposes, cut down by wholesale in order to prepare the needed charcoal. In Ireland also in her early iron-making industry in the seventeenth century large districts of woods, oak and other trees, perished for smelting purposes, and when oak or other timber was no longer obtainable save at a great cost these native smelting works had to be given up. Mining energy and chemical science were both wanted for the utilisation of other native resources, but the time was not ripe.

In connexion with the history of British, and particularly of Mediæval, building, carpentry, joinery, carving, and furniture work, the oak, native and foreign, plays a conspicuous part. We need not dilate on its mastery and workmanlike use in our old ecclesiastical buildings. We see it in the design, the construction, and the execution of those marvellous open-timbered roofs, and in the deft, angelic, saintly, humanised, agonising, and grotesque carvings and expressive adjuncts that accompany them. As nature and human nature under the living tree communed, so the oak still, though felled and framed into a ribbed embodiment, spoke of a creation, power, and purpose, because embracing much of the genius and art and the living handiwork of a God-serving man. The germinating acorn might no longer quicken, no green foliage might be seen, but there was still a perennial fount of inspiration in the children of the craftsman's brain, and the faces, forms, flowers, and fruitage which his dexterous skill flung richly about or interweaved into a proportional and harmonised whole. In castle and mansion it was still the same. The oak of the adjacent forest or manorial plantations oft supplied the wants of the family mansion and the requisites of husbandry. The oak that contributed the roof and panelling of the dwelling was in part utilised for the needs of the farm. The acorns not only fed the swine, nor were the leaves collected merely for bedding-out manure, but were made to yield a dye, as the bark itself a tanning ingredient. Chemistry might be young in these old times, but thrift, sagacity, and common sense made up a compound of simple yet valuable domestic knowledge, which modern fashion has unfortunately nearly scattered to the winds. We lean upon a reed too often in many ways in these later days, instead of, like our predecessors, relying upon an oak, and, oak-like, tenaciously clinging to and embracing what should constitute our lasting support through life. The oak has given proverbs and maxims many to our language, as it has given subjects in all ages to painting, sculpture, and architecture. "The wooden (oaken) walls of England," carried proverbial "hearts of oak"; so in naval as in civil and ecclesiastical architecture, the oak, in symbolism and reality, is overwhelmingly incorporated.

In respect to wood sculpture, we have reliable evidence that the oak and sundry other hard woods were used by the ancients and many statues of deities and other worthies were sculptured or carved. Pausanias, Pliny, and other ancient authors may be consulted on the subject. In more modern days Felibien mentions a French artist at Florence, who executed sundry statues in wood. This wood-sculptor's name was Janini, and one of his statues, "St. Roque," was con-

sidered by Vasari as a marvellous production. This artist's creations in wood were said, in style and finish, to equal marble. Although the celebrated Grinling Gibbons is credited with having created a school of carvers in England, good wood-carving was executed in these islands long before the time of Gibbons. He certainly gave a great impulse to the art of wood-carving, and many specimens of his art in connexion with the churches and mansions of his great patron, Sir Christopher Wren, show remarkable grace and freedom, with appropriateness in the grouping and treatment of his subjects. It must not be forgotten that some of our old stone-carvers also occasionally manipulated in wood. The artists in marble, alabaster, and other lime and free stones have in some instances operated on wood with much spirit and freedom, and no wonder need be expressed at their success, although a wood-cutting tool needs a different handling to that of the stone-cutting instrument. There are some specimens of the work of the wood-carvers of the Flemish school in Ireland as well as in England, and in the Royal Hospital, Kilmalham, Dublin, — a building credited to Wren, — examples in oak of the work of Grinling Gibbons are to be seen. Two classes of old wood-carvers obtained for long years in England, — the house and the ship carvers; but since the advent of iron shipbuilding the glory of the latter school has faded. The figure-heads, marine deities, ropings, mouldings, and other somewhat coarse but elaborate carvings in men-of-war and merchant vessels of Great Britain are no longer executed. Since the first decade of the present century there has been a rapid decline and contraction in ship-carving. Those who have an acquaintance with the monthly periodical literature of the last quarter of the eighteenth century need not be informed of the intense interest that was manifested in timber shipbuilding, its improvement, and the growth and quality of the oak of the British islands. A legion of essays, treatises, pamphlets, and letters flooded the market. In looking back through this buried mass of correspondence and naval architectural literature, few could ever conclude from the standpoint of the writers that half a century later would render the most of their suggestions and dogmatic statements of little avail. The naval victories of Nelson kept the national mind aroused, and acorn planting and sapling transplanting and the bending of young oaks in coppices into compact shapes for future shipbuilding went bravely on.

Some of the more special characteristics of the oak in regard to qualities and application, more particularly in relation to building, carpentry, and enduring handicraft, will form the subject of a concluding paper.

#### CORK CATHEDRAL.

DURING the last week of the past month another stage has been arrived at in the progress of the Cathedral Church of St. Fin Barre, Cork. By the addition of three stained glass windows in the north aisle of the nave, and one in the ambulatory, the entire of the beautiful series of coloured glass in both transepts, ambulatory, nave, aisles, and clerestory of the latter is now completed. There are no fewer than seventy-four windows in position, comprising 145 subjects or illustrations, chiefly relating to the Creation and the Fall of Man, his redemption, final judgment, and the glory of the future state in temple "not made with hands." The last of those placed in the nave aisle are memorials to the late Lieut. Melville of the 24th Regiment, who was killed at Isandula, South Africa: the subject is the death of Abel by his brother Cain. In the ambulatory, the last and final window represents scenes from the apocalyptic vision of St. John. In the top compartment our Lord is represented in glory, having a two-edged sword proceeding out of his mouth; in his right hand are the seven stars, in the other the orb; in the bottom panel are the seven golden candlesticks, each differing in colour and design. In the centre panel are the Evangelistic symbols surrounding an open book, on which are the Greek letters A Q, — Christ the Alpha and Omega, — the great subject and theme of the artist. It is a memorial to the gifted architect of the cathedral, Wm. Burges, A.R.A., and has been the gift of his father. Though not intended, there is a fitting suitability in the sentiment of these paintings. The car-

tons were painted by Mr. H. W. Lonsdale, and they were all carried out by Messrs. Saunders & Co., with their successors in trade, Messrs. Worrall & Co., Endell-street, London.

#### COMPETITION FOR THE NEW HOUSE OF THE GERMAN IMPERIAL PARLIAMENT.

THE 10th inst. was the final term fixed for the sending in of the competitive drawings for the new Imperial Parliament House of Germany, and by twelve o'clock at noon on the date in question, being the last moment for the reception of designs in this competition, the committee found that no fewer than 196 competitors had handed in their papers in time. The very last of the rival drawings in fact only reached the Ministry of Public Works five minutes before the hour when the competition closed. The committee which has to adjudge the prizes, has had the whole of the drawings suitably hung, and is engaged now in examining them. The decision of the committee will be taken, and the premiums awarded before the public are admitted to view the collection. The Berlin papers state that there are some very remarkable designs among the number, and that the style adopted by the great majority of the draughtsmen is the Renaissance.

A large number of architects from all parts of Germany, as well as from the German speaking parts of Austria and Switzerland, are expected at Berlin when the committee announce their decision and admit the public to view the collection of competitive works. The flourishing Society of Architects of Berlin contemplate giving the visitors a festive reception in their splendid club-house, which has recently been re-decorated by Herr Prell, the artist.

#### THE FALLING MOUNTAIN AT ELM.

THE news of another catastrophe at Elm, in Switzerland, appears in the Continental papers of the past week. Fortunately, the new accident was not accompanied by the disasters which befel the village in question, on the occasion of the fall of part of the mountain last autumn. On the 12th of September last, it will be remembered that most of the village of Elm was destroyed by a mountain slip, such as had never occurred in Switzerland since the fall of the Rossberg, near Galdan, in 1806. At Elm there were eighty buildings completely destroyed, and 114 lives lost. Herr Heim, who examined the Risikopf shortly after the catastrophe, states that the piece of the mountain which fell measured upwards of 1,200 ft. across. The stream of rock and rubbish left after the fall in the valley was a mile long, and from 900 ft. to 1,200 ft. in width, while the area it covered was about 670,000 square metres. There were several blocks of rock weighing upwards of 3,000 tons hurled down into the valley from a height of 1,800 ft.; and the total quantity of rock and earth which fell was estimated at from 15,000,000 tons to 20,000,000 tons. The geological character of the mountain at Elm is varied, one portion consisting of limestone, and another of sandstone, while, in addition, there were layers of marl and slate belonging to the tertiary formation. The inhabitants of Elm had been chiefly occupied in quarrying the better and harder portions of this slate. In order to obtain these they had for years been blasting and removing the softer and comparatively valueless portions of the slate, so that the side of the mountain above the village was completely honeycombed with galleries. This undermining of the mountain, in fact, had a great deal to do in bringing about the calamity. After the great fall of September last year, it was soon discovered that there was still a large portion of the Risikopf in a dangerous condition. With some difficulty a cannon was got into position, later in the autumn, and for many days a bombardment was kept up at the crumbling hillside, with a view to bring it down; but without success. It was last winter predicted that within a few months that portion of the Risikopf west of the first fall would be sure to come down, bringing with it a mass of rock and earth nearly three million tons in weight. In the worst case the predicted fall would sweep away that part of the village of Elm which escaped last September.

As we have above intimated, the slip which had been so clearly foreseen has at length taken



place, though its dimensions proved but trifling compared with what has yet to come. It occurred on Saturday, the 10th of June. The authorities had been keeping up a regular series of measurements, in order to ascertain whether and how fast the loose part of the mountain was moving. It was found that between December, 1881, and May, 1882, the upper part of the Risikopf had slipped 70 centimetres in a downward direction, while the crack which separated the moving part of the mountain from the rest of the Risikopf had grown nearly 5 ft. wider. Fortunately, the direction of the motion was rather more to the east than towards the village of Elm. The top of the mountain was slowly but surely separating itself from the rest. Between the 30th of May and the 12th of June the crevices at the back of the Risikopf had increased their width by 6 to 8 centimetres. The noise of the moving mass had ceased during the winter, but in the course of the month of May it became quite perceptible again. At length, at four o'clock on Saturday, the 10th inst., a mass of the mountain, as large as several houses in one, was observed first slowly to bend forward and, gradually accelerating its speed, it at length fell, taking the direction of the hollow which had been left by the slip of last September, and finally scattering itself over the debris left on that occasion. The fall was again accompanied by a loud crashing noise, which was clearly heard at the village of Matt, some miles away. Many thought that the whole of the top of the Risikopf had come down. In the course of the evening separate pieces of rock, earth, and stones commenced falling, and continued doing so through the night. This caused the inhabitants to withdraw from the village until the morning when the true state of things could be ascertained. Before daybreak, however, the loose stones and earth had ceased falling, and when daylight came it was seen that notwithstanding the mass that had fallen there was no material alteration in the general shape and contour of the Risikopf. On the following two days the mountain was ascended and examined, when it was found that a piece of the mountain of several thousand cubic metres on the east side had fallen eastward, and another smaller portion on the western side had fallen in the direction of Elm. The blocks of rock, however, had not fallen as far as the bottom of the valley.

The most important result of the investigation was that the quantity which fell on this last occasion hardly amounts to one-hundredth part of that portion of the Risikopf which is nearly ready to fall. When the great slip takes place, the mass which will come down will immensely exceed even the great slip of last September. Loose stones and earth are now incessantly falling, and the catastrophe may take place at any moment. It is found that the entire top of the Risikopf is now moving en masse, and the result of all the observations is to show that the whole of it will probably come down at one time, or in two or three parts at most. It was hoped that the mountain would at length settle, but this hope is now abandoned, as, since the winter, its motion has been constant. It is not yet possible to judge whether the fall of the chief mass will be towards Elm or in an other direction. In any case, every day is bringing us nearer to the most tremendous landslide known in Europe for generations past. Naturally, the inhabitants of Elm are in a constant state of trepidation. In order to hasten the final catastrophe, it has been proposed to bombard the lower portion of the moving mass with far heavier artillery than that which was employed before.

**The Victoria (Philosophical) Institute.**—At the annual meeting of this Society, held at the House of the Society of Arts, the Earl of Shaftesbury, K.G., in the chair, the honorary secretary, Captain F. Petrie, read the report, from which it appeared that the total number of members was now upwards of 950. Professor Pasteur and many other well-known men of science having joined the Society in the past year, during which papers and short communications written in furtherance of the Society's objects, namely, the investigation of philosophical and scientific questions, especially those said to militate against the truth of Revelation, had been contributed by several scientific men at home and abroad.

#### BIRMINGHAM ARCHITECTURAL ASSOCIATION.

The annual dinner in connexion with this association took place on the 15th inst. at the Grand Hotel, Colmore-row.

Mr. J. A. Cossins, who presided, proposed "The Birmingham Architectural Association," and urged that it was the duty of each member of the association to do all that he possibly could to ensure the success of the association. Another important matter which he trusted their association would promote was one that he was reminded of by a circumstance in connexion with Mr. Ruskin. When Mr. Ruskin's "Seven Lamps of Architecture" first made its appearance and astonished the world, some unfortunate architect wrote to the papers and expressed a strong desire that Mr. Ruskin had put in an eighth lamp, and that was the lamp of "making it living." To ensure the desired end, the first requisite was to gain the entire confidence of their clients and the public. He was sorry to say that that confidence had been somewhat shaken by a few blacksheep who had gained profits where they should not have done. They would lose the confidence of the public unless that practice was stopped.

The chairman next proposed "The Profession," and spoke of the wonderful change which had taken place, during his time, in the public taste as affecting styles of architecture. He remembered that when he was first articled the "Battle of Styles" was raging, and that while some pointed to the Post Office in London as the purest and best style, others pointed to the Houses of Parliament. For domestic architecture Barry's Italian style was thought to be everything that could be desired, and it had almost arrived at finality. It would be very interesting to think what architecture would be in twenty years. He had seen during his connexion with the profession the predominance for a time of Egyptian, the Moorish, the Greek, Roman, Italian, Romanesque, Italian Gothic, pure English Gothic, free adaptation of Gothic, and the style of Queen Anne.

Mr. Henman, in responding, said he was glad that the subject of competitions was being placed upon a somewhat better footing, and he was anxious to see the necessity of diplomas more widely recognised.

Mr. Dunn proposed "The Kindred Arts," and referring particularly to art metal work, coupled with the toast the name of Mr. J. W. Tonks, who responded.

The remaining toasts were "The Honorary Members," "The Retiring President and Committee."

#### SALES OF SHARES IN VARIOUS PUBLIC COMPANIES.

VALUE OF GAS SHARES.

LAST WEEK MESSRS. FOX & Bousfield held a sale of shares in several public companies, at the Auction Mart, Tokenhouse-yard. Amongst others the sale included 500 10l. shares, fully paid up, in the Lea Bridge District Gas Company, being a fresh issue, under the statutory powers of the company for increasing the capital. It was stated that the purchasers would be entitled to a dividend at the rate of 7 per cent., with an advance on such dividend corresponding with the reduction in the price of gas supplied. The particulars announced that the area over which the company had powers of supply comprised the whole of the parish of Walthamstow, and a portion of the parish of Leyton, in both of which parishes building was going forward at an enormous rate with a corresponding great increase of population, the districts having assumed the character of a metropolitan suburb. There was a very large attendance at the sale, and the auctioneer, in introducing the property, incidentally adverted to the threatened competition by the Electric Lighting companies, observing that there was little probability of their injuring the gas companies to any appreciable extent, one consequence of the electric light agitation having been to induce the gas companies to manufacture better gas, whilst they were also reducing their rates, with a corresponding increase of dividend to the shareholders. The stock was offered in lots of ten shares each, all the shares readily finding purchasers at prices ranging from 11l. 10s. to 12l. per share, representing a premium value of from 15 to 20 per cent. per share.

The next property offered comprised twenty

100l. shares in the New River Company, which were all sold at 385l. and 390l. per share. A fortieth portion of a king's share in the same company was sold for 1,500l.

Amongst other stock submitted were 100 10l. shares, fully paid-up, in the Bedford Park Estate Company at Chiswick. The particulars stated that the Company was formed in 1881 to purchase the estate, and develop on a more extended scale the successful enterprise of its then proprietor. The capital is 125,000l. in shares of 10l. each, entitled to a preference in capital, and a cumulative preference dividend of 5l. per cent. per annum, and a bonus of 25 per cent. on redemption. It was stated that for the half-year ending February last an interim dividend of 5 per cent. was declared. The property was sold in lots of ten shares each, realising only 8l. 15s. per share.

Amongst the other shares offered and sold were five 10l. shares, fully paid, in the Langham Hotel Company, the last dividend on which was at the rate of 10 per cent. per annum. They realised 17l. 5s. per share each.

#### A NEW WORKHOUSE FOR WANDSWORTH AND CLAPHAM.

THE Wandsworth and Clapham Board of Guardians have just resolved upon the erection of a large and costly new workhouse, in consequence of the present building being too small for the number of inmates. The decision was arrived at last week's meeting of the Board. The motion for the erection of the proposed new workhouse having been made, some of the guardians opposed it, and Mr. Barr moved an amendment to the effect that there was ample room on the present site to provide accommodation for the inmates, and that there was no necessity for a new workhouse. He urged that the space in front of the present workhouse might be utilised as a site for the enlargement of the house; but the Rev. Canon Erskine Clarke reminded the Board that the Local Government Board had refused to sanction plans to enlarge the workhouse on the present site. In the course of the discussion Dr. Longstaff, in supporting the proposal for the erection of a new building, strongly condemned the practice of giving out-door relief as the most extravagant system ever adopted in the world. To spend thousands of pounds in enlarging a workhouse in building a new one was really more economical than in granting out-relief. The Chairman said it was far better to build a new workhouse than enlarge the old one. Patchwork was a most expensive way to build. The proposal to erect a new building was adopted by a majority of twelve to four, and it was further resolved that ten acres of land, offered by Mr. Davis, near Allfarthing-lane, at 1,000l. an acre, be purchased as a site. The land for the proposed new building will, therefore, cost 10,000l., and the estimated cost of the building itself is set down at about 30,000l.

#### A CHAT ABOUT ROCKWORK.

We all love rocks and like to imitate them in our gardens, but the materials at our disposal are very few and not easily managed. Brick burrs most of us have had a turn at, but do what we will with them we cannot, somehow, make them look anything but what they are, so we stick in plants as thick as we can and trust to providence to cover them up as quickly as possible.

Then they are so heavy we want quite a formidable foundation to support them, and if we want them for our conservatory floor we must carefully examine our supports before we venture on the extra weight. Do what we will they will not look like rocks; rocks have no rectangular edges,—rocks are not all 4½ ft. by 3 ft. melted together of a dirty yellow colour with black patches here and there: so brick burrs, having answered their purpose until structural alterations have become necessary, are smashed up at last, mixed with mortar, and pitched in for foundations, for which they are excellently well suited.

Then cork had its season. Quite bumpy and rustic it looked; everybody was delighted. Bundles of cork might be seen going in all directions, easily fixed, light, of a capital colour and surface.

We all cried "Eureka!" and thought the problem solved at last.



Well, after a bit we began to question our gardeners in this fashion:—"How is it," said we, "those seedlings are all eaten, and those young shoots all gone?" "Can't help it," says our gardener; "shall never get anything to grow as long as that cork stays there." "Cork," say we, "what's the matter with that?" "Just look here, sir," says our gardener, pulling down a piece; "stand on one side or you will be covered with insects." We do as we are bidden, and, to our disgust and astonishment, we see at the back of our beautiful cork dozens of creeping things running in all directions.

"Take it all down carefully, gardener," say we, "don't shake it; put it all into the fire and give the place a good lime-whiting."

We have heard of the Smithsonian system of rockwork, so we inquire about it. Nothing in nature is half so wonderful. Nature only makes a waterfall here and there; peaks and ravines are miles and miles asunder; lakes and snow-clad mountains are scattered over the earth's surface; but by the Smithsonian system all the wonders of the world can be produced in a back garden, 14 ft. by 10 ft., at so much a foot super. Look what it saves in travelling,—the hotel expenses, the loss of time,—by this system! When you want to see Niagara you have only to turn a tap, and you produce Mont Blanc with a pail of whitewash and a mop. Then the cost (we are not all Mr. Mantelins), we must consider that. The cost is our stumbling-block, so we must leave the Smithsonian system to our millionaires, and see if we cannot afford something cheaper. What we want is something light, so as to be easily handled; porous, so as to hold water and mould; of an irregular shape, so as not to suggest waste building materials, that can be adapted to any circumstances and fixed by any one, and not too expensive, or we shall not be able to afford it, and that can be produced in any quantity.

Well, I have been pottering at the matter for some years, and I really think I have at last got the very thing, and I fancy the best way will be to produce it in blocks about 1 ft. across, and one half the height, of an irregular conical shape. I have seven colours,—black, brown, dull red, bright red, grey, dull yellow, and white, and I think I can sell these blocks, which will contain about half a cubic foot, at 6d. each.

There will be a show of horticultural matters at the Agricultural Hall next month, from July 24th to August 5th, and I have engaged a space in the centre of the hall where I shall show, amongst other matters, the rockwork I speak of, and as it might be easily overlooked, I have drawn your attention to it.

Some samples I will also send to my place in the Poultry, No. 35, and some to my shop in Bunhill-row, No. 121, so that if you are interested in the matter you will know where your curiosity can be gratified. If you have any taste for rockwork buy the raw material and see what you can break it down and build it up again; put the dark rocks at the bottom, and perhaps in time, if Nature has blessed you with genius, even the Smithsonian system itself may not be beyond the reach of your ability. W. H. LASCELLES.

#### THE CORN EXCHANGE, LONDON.

This building has been recently erected in Mark-lane from the designs and under the superintendence of Messrs. l'Anson & Son, of Laurence Pountney-hill. It occupies not only the site of the old Corn Exchange, but also that of 52, Mark-lane, which adjoined it on the south side, and was acquired to enlarge the market. The total area of the site is about 19,400 superficial feet.

The new Exchange consists of a front block next Mark-lane, containing on the ground-floor the vestibule, and on the first floor a flour-room. In the rear of this is the market, consisting of a large central hall or nave, 120 ft. long by 60 ft. wide and 68 ft. high in the centre, surrounded on three sides by aisles 20 ft. in width. The nave is divided from the aisles by arcades of grey Kenney polished granite columns and Portland stone arches. The columns are of the Doric order, 2 ft. 6 in. in diameter at the base and 18 ft. high, and are placed 20 ft. from centre to centre. The roof of the nave is carried by semicircular wrought-iron ribs, 20 ft. apart, springing from the string-course which surmounts the arcade, and they

are continued over the aisles in a quadrant form down to the floor-level, where they are tied by the girders which carry the floor.

The aisle roofs are glazed on Rendle's system, with copper grooves, and the glass used, both in aisle roofs and in the lights of the roof over the nave, is Hartley's rolled plate. The ground-floor is constructed with the Dennett arch, and is laid with a floor of cubes of wood in iron frames grooved on the surface (Westwood's patent). Below are two tiers of vaults with ventilating-flues in the thickness of the wall.

The building has a frontage only on Mark-lane, which is the subject of our illustration. At the eastern end it communicates with a sub-scription-room and refreshment-rooms, and there is a way through into Seething-lane. The plinth of the facade is of Kenney grey unpolished granite; the ground-floor and attic of Portland stone, and the shafts and columns of pilasters of red Aberdeen polished granite. The length of the frontage is 105 ft. The Exchange has been built in sections, and the business of the market has been uninterrupted by the rebuilding.

Mr. William Barlow, Engineer of the Midland Railway, was consulted with, and advised as to the construction of the iron ribs which carry the roof.

The lighting of the Exchange as to the aisles is by a glass roof, which follows the form of the iron ribs by which it is supported, and as to the nave, by ranges of vertical lights, between which are horizontal spaces forming a ceiling below and gangways above for access to the machinery by which the vertical side-lights are opened all round the building for the purposes of ventilation, for access to the blinds, and, on the lower gallery, to water-pipes, by means of which the glass roof of the aisles may be flooded.

Messrs. Adamson & Sons, of Ealing, were the builders, and Mr. Merrifield was clerk of works.

#### THE ROOF OF THE CORN EXCHANGE, MARK-LANE.

As a supplement to the external view of the Corn Exchange and the particulars given in our present number, we reprint a description of the iron ribs and the roof, read by Mr. Edward l'Anson, F.G.S., at the General Conference, held on June 7th, 1878.

The old Corn Exchange, in Mark-lane, London, having fallen into decay, and the market, which had already been considerably increased by an addition to the area of the original market space, being still insufficient, an adjoining piece of land has been acquired, and a new Exchange is now in course of erection on the enlarged site. The building will be about 100 ft. in width, and after long deliberation it has been determined that it shall consist of a block about 40 ft. in depth next Mark-lane, containing, on the ground-floor, the staircase, vestibule, &c., and on the first-floor a flour-room; and in the rear of this block a central area or nave, surrounded on three sides by aisles. The nave will be 60 ft. in width, and the aisles each 20 ft. The nave is separated from the aisles by an arcade, the arches of which have a span of 20 ft., and the height to the top of the cornice over the arches is 30 ft. measured from the floor. The roof over both aisles and nave is carried by curved ribs of wrought iron, each of which springs from the floor; has a span of 100 ft., and rises to a height of 61 ft. 9 in. from the floor; and is seated over one of the columns of the arcade. That part of the rib which spans the nave is semicircular. At the floor level each rib is bolted down to the brick pier built to receive it, and secured to one of the iron girders which, running across the Exchange from side to side to carry the floor, acts also as a continuous tie applied at the springing or lowest part of the rib. The iron ribs, like the columns of the arcade dividing nave and aisles, are 20 ft. apart from centre to centre. As to the construction of the roof, which has been the result of most careful consideration, I do not here propose to make any remarks, my present object being only to describe the iron ribs which it has been decided to use in order to carry it.

The profile of the rib having been determined, the question was what section should be given to it, and under the advice of Mr. William Barlow, the well-known engineer, the following dimensions have been adopted:—The depth of semicircular portion which spans the nave is at the apex 2 ft., and gradually increases until

at the point where it springs from the top of the nave arcade it is 3 ft. 10 in. in depth. The depth of that portion which spans the aisle is, for the vertical part 1 ft. 9 in., and for the curved part 2 ft. The rib is made up of top and bottom plates, web and angle irons. The dimensions of these parts are (with the exception of the web which, as before stated, varies in depth) uniform throughout, and are as follow:—Top and bottom plates, 11 in. wide and five-eighths of an inch thick; angle irons, 4½ in. by 4½ in., and five-eighths of an inch thick; web, three-eighths of an inch thick.

The ribs have a tie at the feet, as already described. It will be observed that the object to be attained was a rib which should bear upon the arcade but exercise no thrust upon it, and that the whole rib, securely fastened at the bottom, should be perfectly rigid throughout. In order to test the capabilities of the rib, a small tin model was made, and being heavily weighted showed a tendency to rise from its seating on the arcade, demonstrating the necessity for giving considerable stiffness to that part of the ribs which would span the aisle. This model represented, correctly to scale, the span and height of the rib, and also its profile, but did not represent with anything like accuracy the sectional areas.

On Mr. Barlow's advice a model was made of two ribs one-fourth full size. These were constructed of wrought-iron and built up with flanges, plates, and angle irons, all riveted together; they were accurate representatives in every detail of the proposed ribs. They were made by Messrs. Moreland, and carefully tested at their works in Old-street, St. Luke's, by Mr. Barlow.

To conduct the test they were placed on balks of timber, at the proper distance apart, and tied at the feet by iron ties. They were connected by purlins of iron placed in the exact position the purlins will occupy in the work. There were six purlins in all, three on each side of the roof, and all placed at levels above the springing of the rib from the arcade; that is, there were no purlins on that part of the rib which spans the aisle. As in the building the load will be received by the purlins, and by them transmitted to the rib; the test loads were suspended from the purlins also.

The following is a table of the loads successfully applied, and the resulting deflections, the loads being in cwt. and the deflections in inches:—

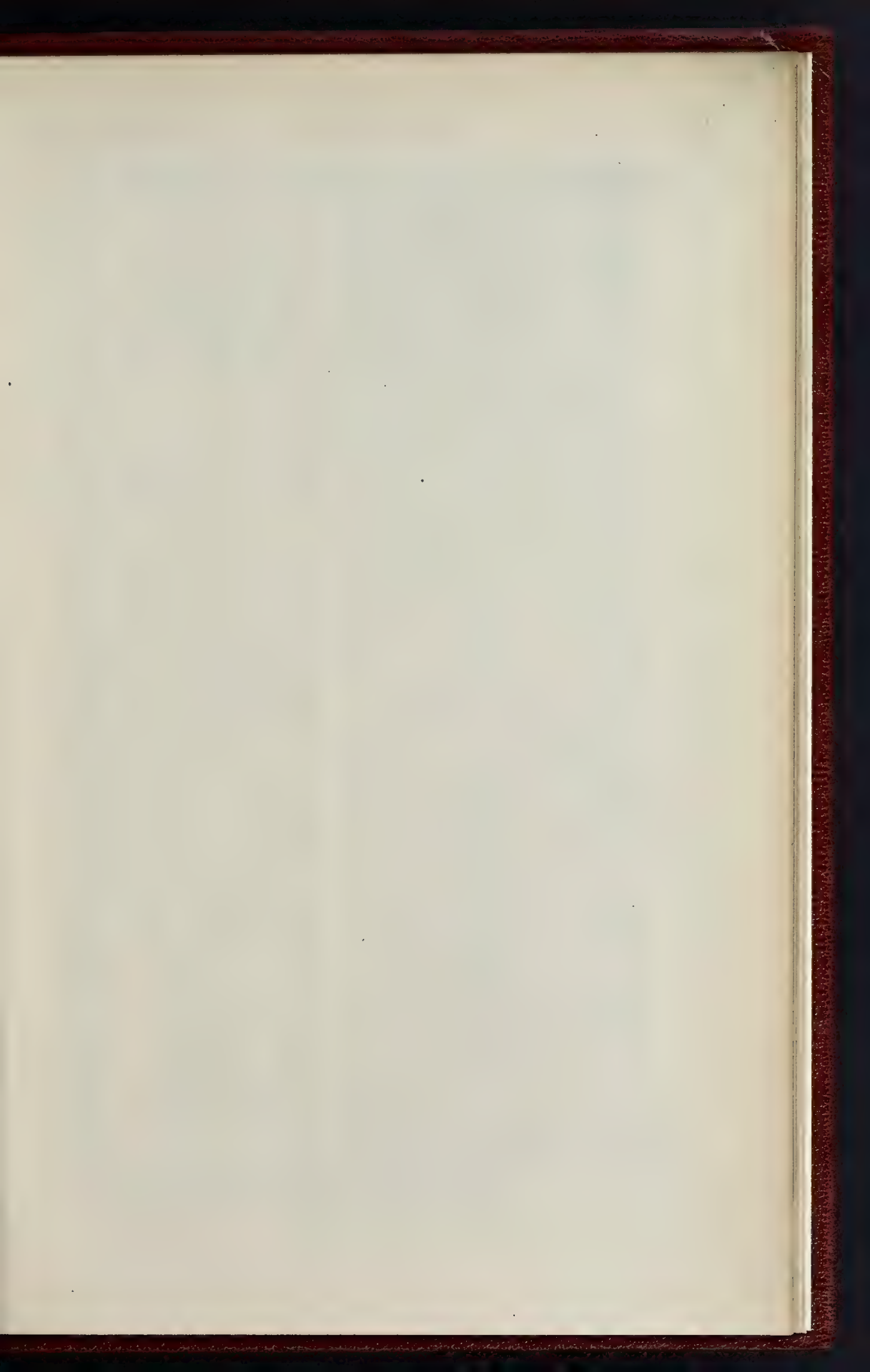
Load on lower Purlin.	De. flexion.	Load on middle Purlin.	De. flexion.	Load on top Purlin.	De. flexion.
6½	·01	6½	·06	6½	·07
10	·01	10	·06	7	·08
15	·03	15	·11	11½	·13
20	·05	20	·16	15	·19
25	·06	25	·19	18½	·24

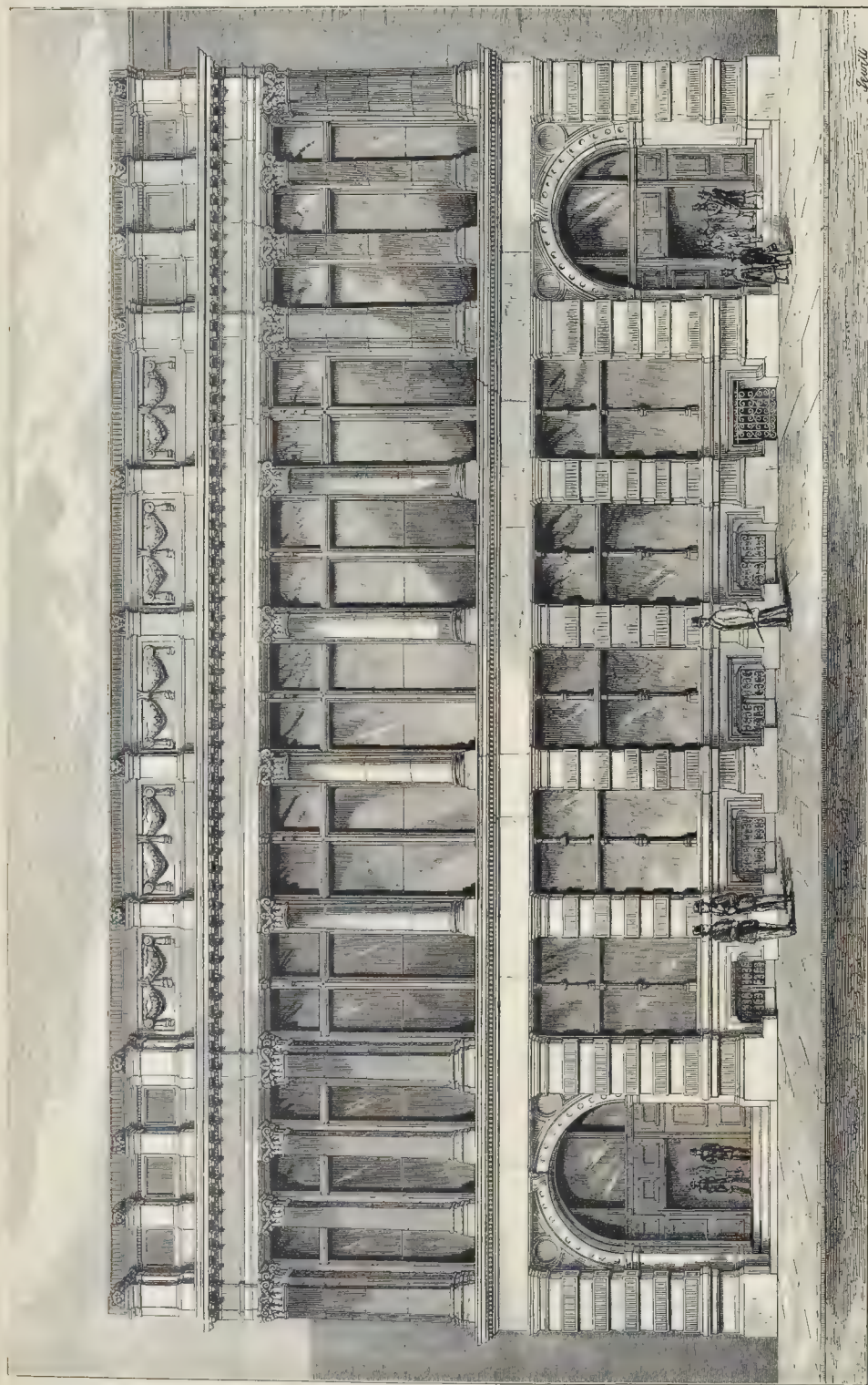
Under the last load, viz., 25 cwt. on lower purlin, 25 cwt. on middle purlin, and 18½ cwt. on top purlin, the extrusion at the point where the rib springs from the nave arcade was ¼ in. on each side; that is ½ in. for the entire span from arcade to arcade.

The greatest load applied to the model was equivalent to about one and half times the calculated maximum of dead load which the rib will have to sustain in the building. When the weights were removed the model ribs resumed precisely their original form, no part having shown signs of undue strain.

**A Long-needed Improvement.**—At the meeting of the Holborn District Board of Works on Monday last, the Chairman called the attention of the Board to the circumstance that if they wished to memorialise the Metropolitan Board of Works in favour of making the new street from the corner of Liquorpond-street and Gray's-inn-road to the Angel at Islington, the time for doing it was by July the 1st. Mr. Davids moved that the memorial be adopted and sent to the Metropolitan Board of Works. The motion was carried, and the seal of the Board affixed to the memorial. It is high time that this necessary improvement was carried out. The perils (to say nothing of the wear and tear of horseflesh) of the ascent and descent of "Mount Pleasant," and of the constricted bottle-neck known as Elm-street, are only too obvious to those who are familiar with the locality.

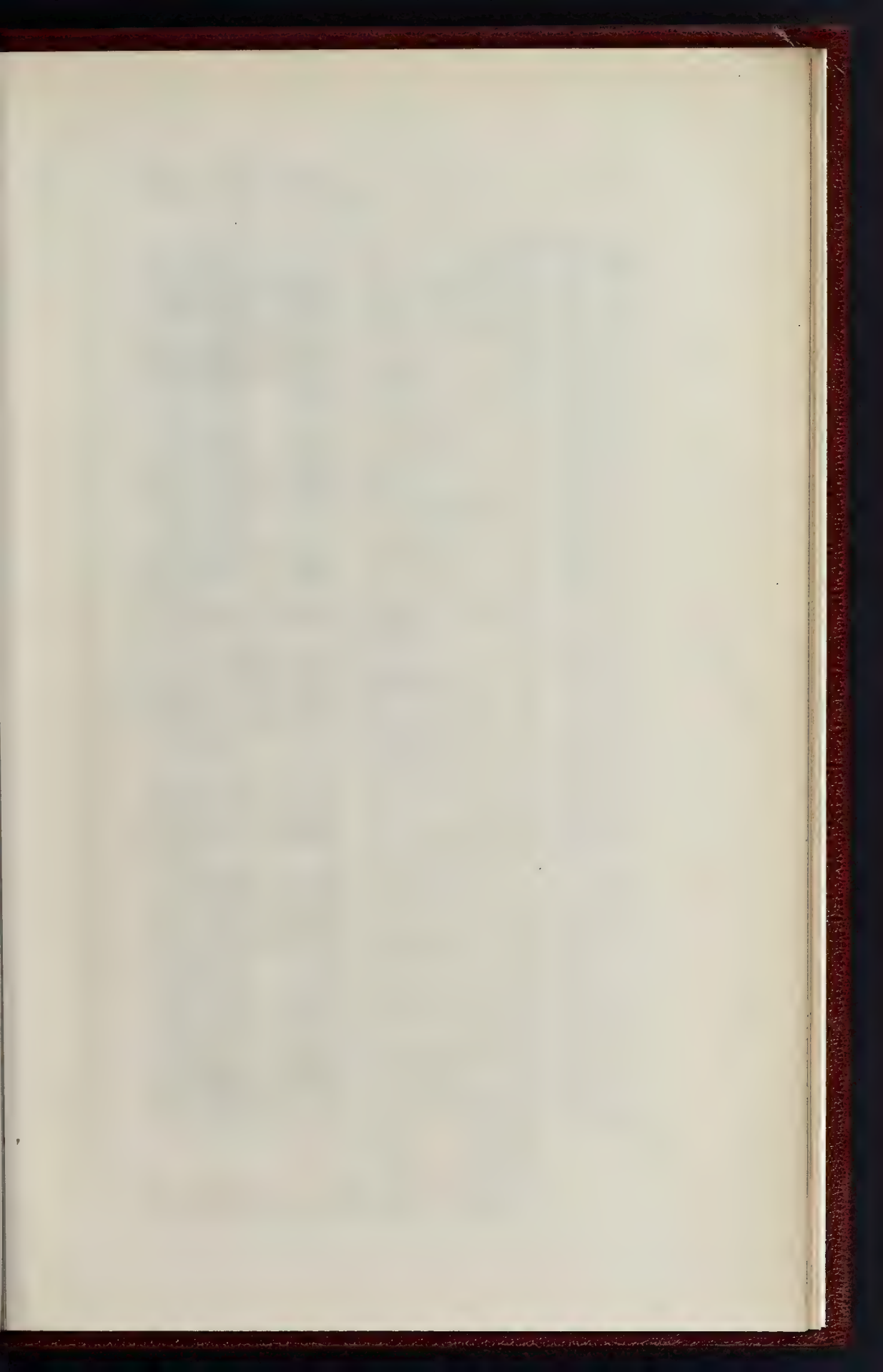






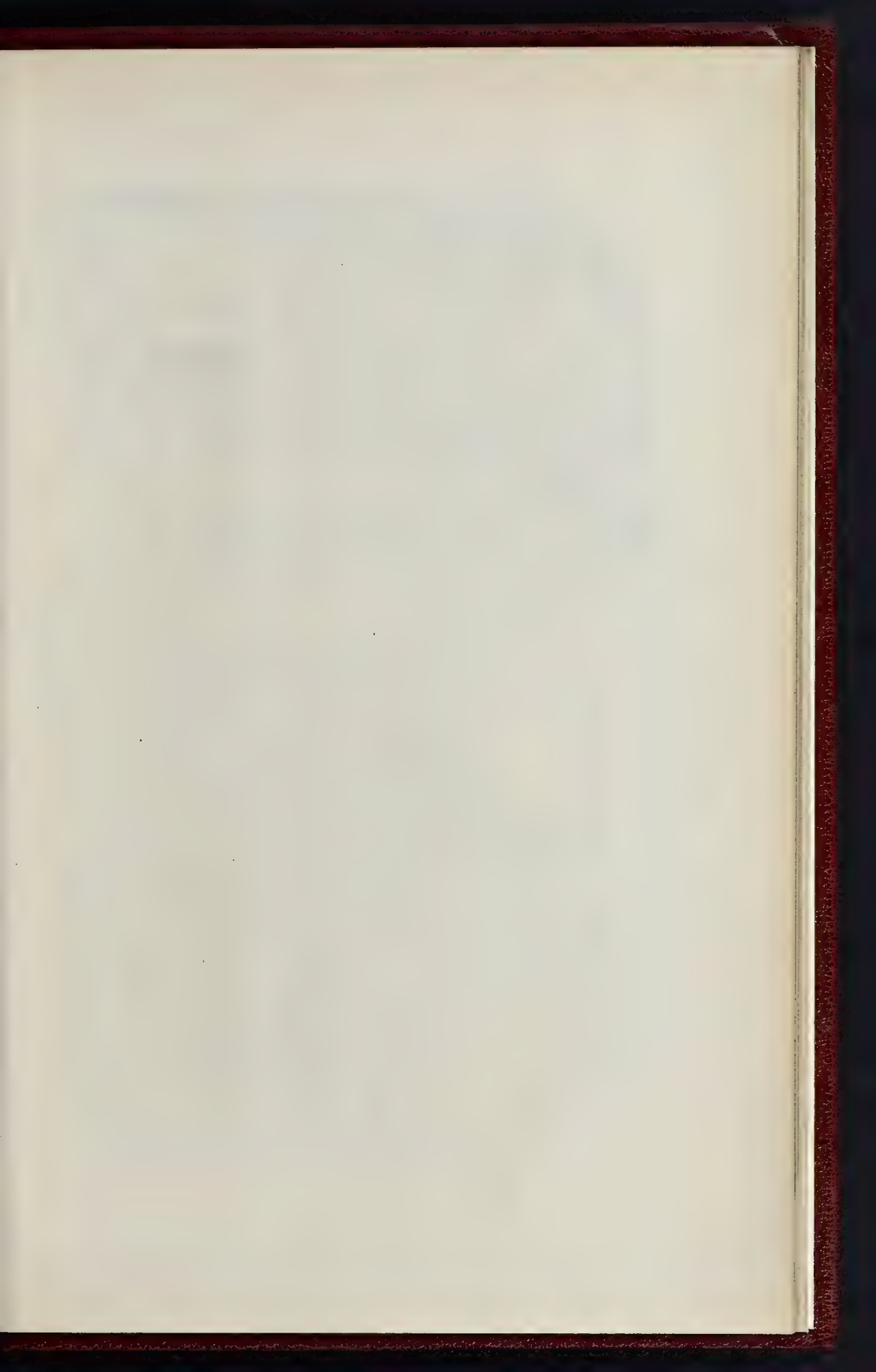
THE CORN EXCHANGE, LONDON.—MESSRS. FANSON & SON, ARCHITECTS.





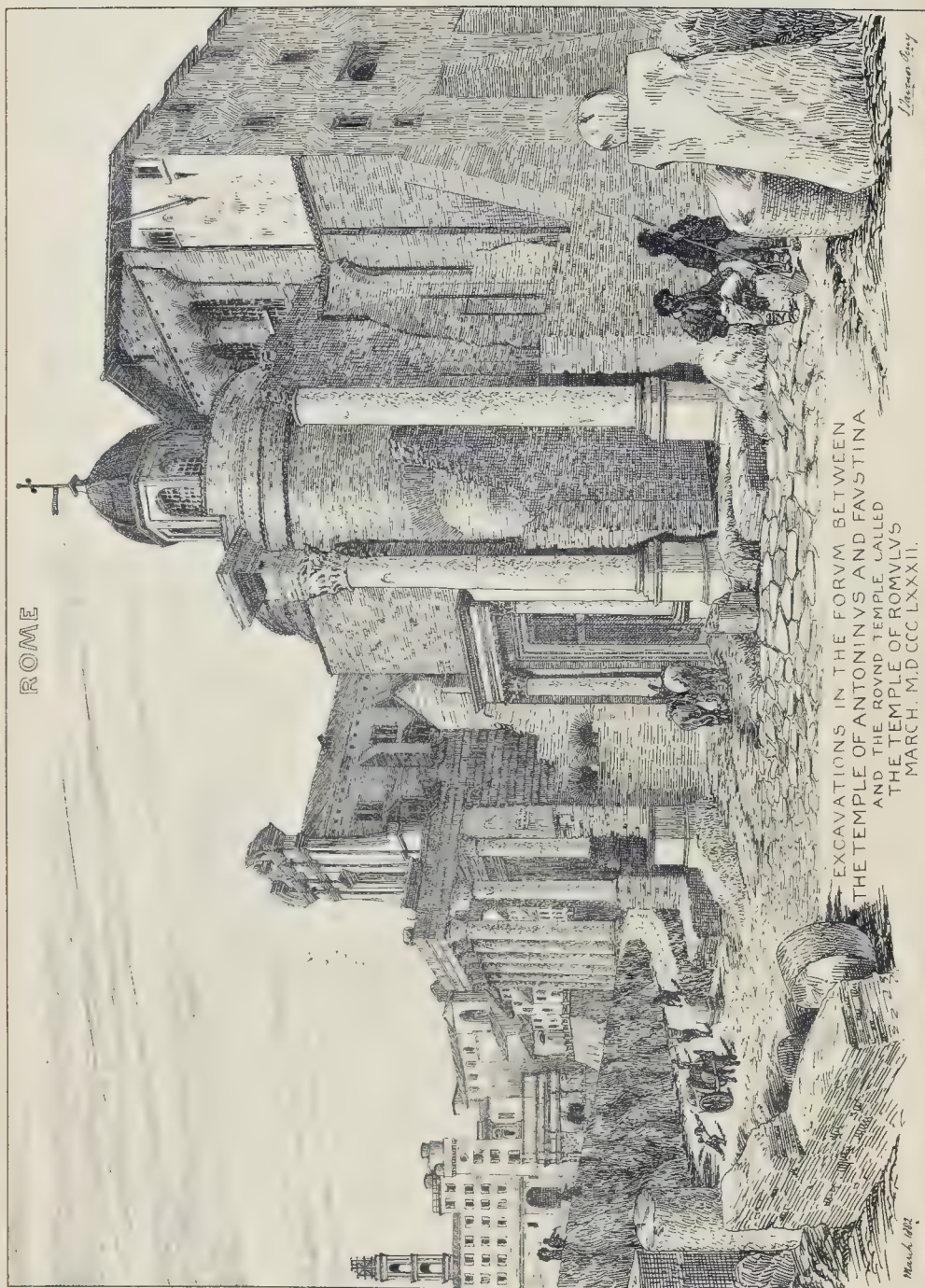






THE BUILDER JUNE 24, 1882

# ROME



EXCAVATIONS IN THE FORUM BETWEEN  
THE TEMPLE OF ANTONINVS AND FAVSTINA  
AND THE ROUND TEMPLE CALLED  
THE TEMPLE OF ROMVLVS  
MARCH, M.D.CCC.LXXXII.

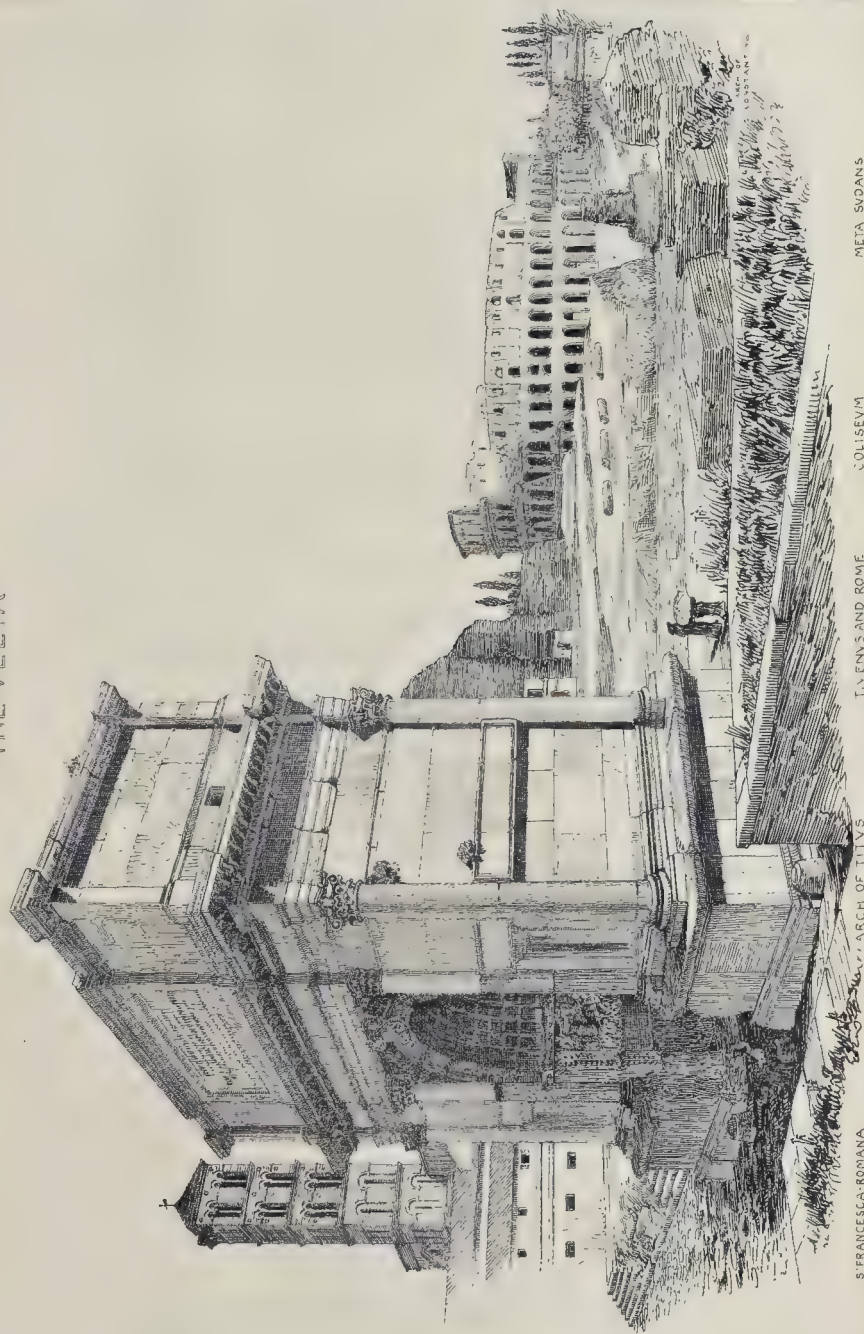
March 1882

Engraved by

W. H. Stiles



# ROME THE VELIA



S. FRANCESCA ROMANA

ARCH OF TITUS

TEMPLES AND ROME

COLISEUM

METASTADANS

*W. H. H. M.*

*J. Jackson & Co.*

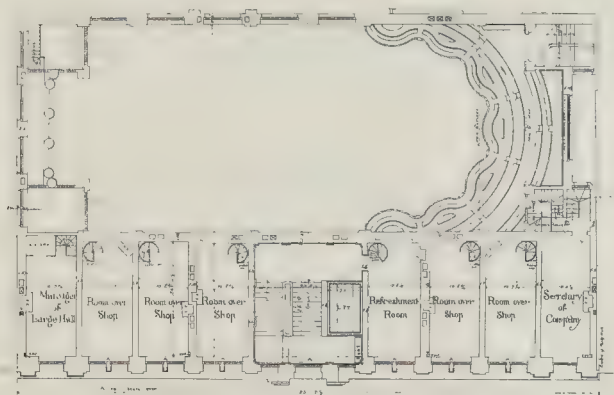
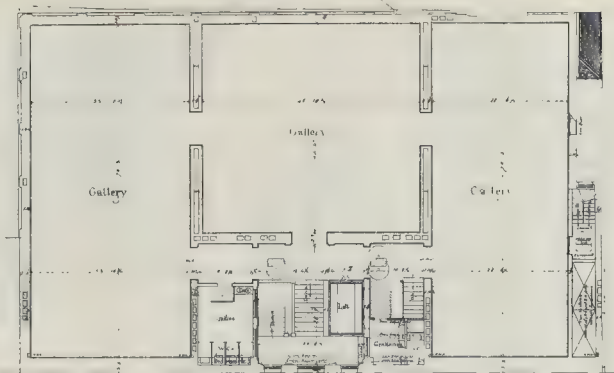
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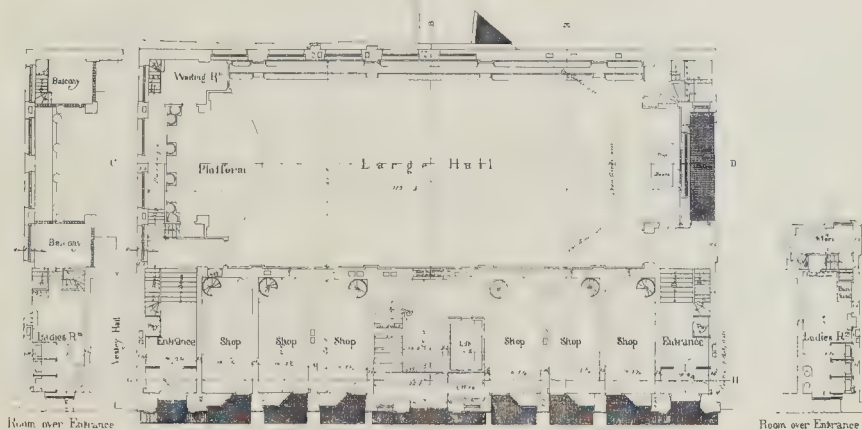




Gallery Plan.



Mezzanine Plan

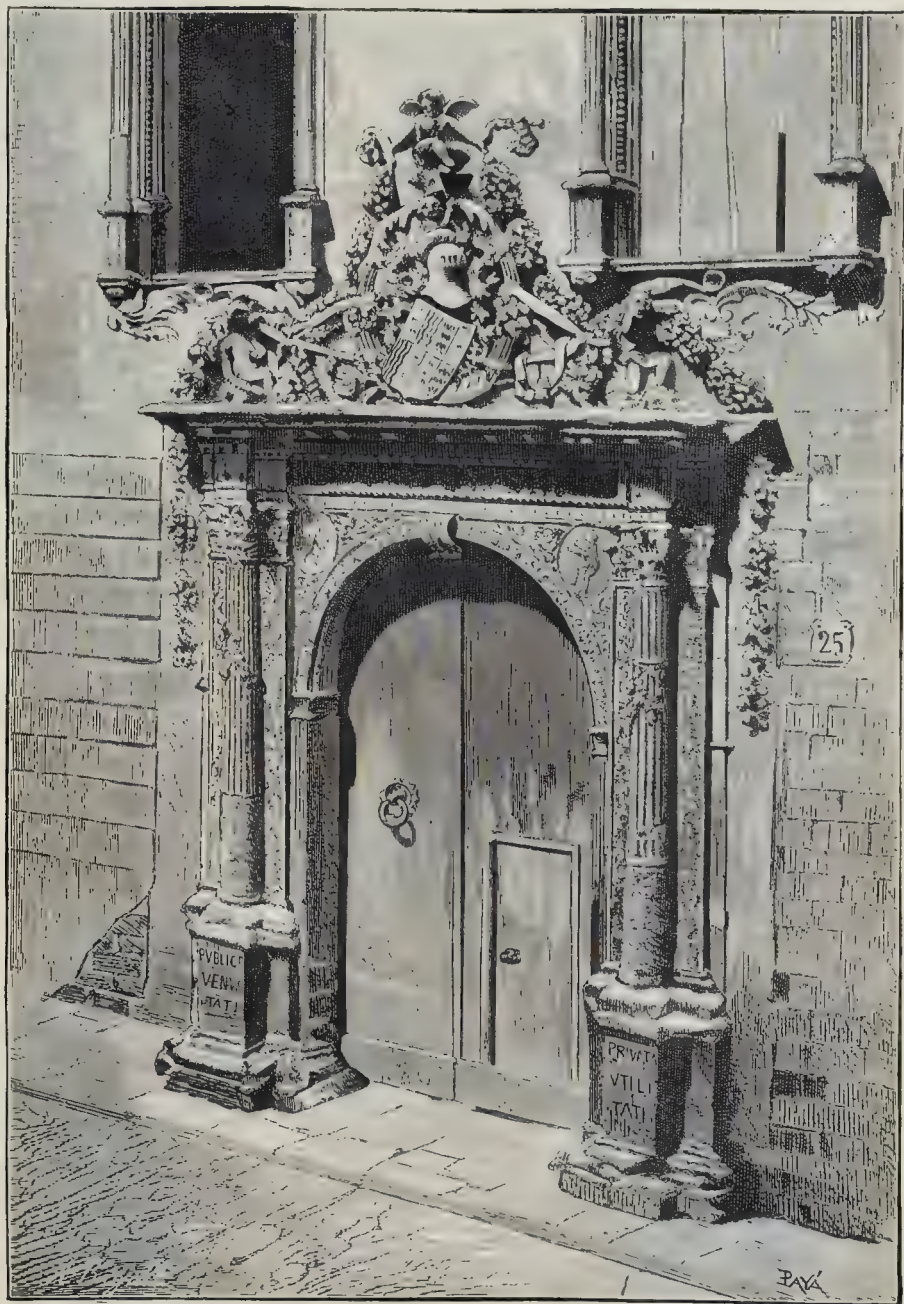


Ground Floor Plan.

Scale 1/4" = 1' 0"







ENTRANCE DOORWAY OF THE CASA DELS GRALLAS, BARCELONA.





## THE PICCADILLY ART GALLERIES.

THE Piccadilly Art Galleries Company has been formed to provide a proper place for the annual exhibition of the works of painters in water-colour, and to do, in short, for the essentially native art of water-colour painting what the Royal Academy does for oil-painting. Although the galleries will be let to the Institute of Painters in Water-Colours, the exhibition will be open to all the world. The chairman of the company is Mr. W. L. Thomas, the managing director of the *Graphic*, and himself an artist in water-colour.

The building comprises six shops towards Piccadilly, each having a basement below and a mezzanine above. At the rear, occupying the whole length of the building, is a fine hall, intended to be used for various purposes, such as music, public meetings, &c., much in the same way as Willis's Rooms are used. Over the whole building are the picture galleries, lighted, of course, from the top.

The design has a pronounced Greek motive, while the natural severity of the style is modified by the free treatment of the doorways and of the mezzanine story with curved lines, also by a line of festoons extending the entire length of the building. Portrait busts of eight of the fathers of water-colour art will be placed in sunk recesses along the wall. Along the whole length of the upper portion extends a large space of blank wall, forming a contrast to the ornate carving below.

We understand that the lighting, warming, and ventilation of the galleries have received special consideration. The front is constructed of Portland stone from the Whitted quarries. The main staircase is of stone from the Craig-leith quarries, near Edinburgh.

The architect of the building is Mr. Edward Robert Robson, F.S.A., whose aim seems to have been to take possession of the entire front as a gallery of art. When the building is completed we shall be able to judge more accurately of the artistic merits or demerits of the design as a whole. The basement portion of the building was executed by Messrs. Holland & Hannen, whose tender, however, did not prove the lowest in the competition for the main structure. This has been entrusted to Messrs. Peto, Bros. The clerk of works is Mr. James Softly. The cost, exclusive of site, furniture, and other expenses, will be over 50,000.

## ROME:

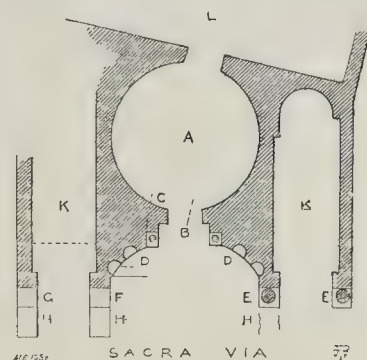
## EXCAVATIONS IN THE FORUM ROMANUM.

To those who have not very recently visited Rome, the Forum would now present an entirely changed appearance. Under the new régime, the work of excavation and clearance has been gradually pushed forward, and now one can walk uninterruptedly from the Velia to the foot of the Capitol, on the ancient level of the Forum. The excavations of 1873 had exposed the space in front of the Temple of Antoninus and Faustina, and those of 1878-9 had laid bare the *Sacra Via* in front of the so-called Temple of Romulus; but it was not until this year that an attempt was made to remove the accumulations of soil on which ran the road from the Velia in Miranda to the front of S. Maria Liberatrice, and which, almost bisecting the Forum, covered a large area of unknown ground. This work has now been accomplished, and the result is that many and important discoveries have been made, and nearly the whole Forum area is exposed. The full value of these discoveries is, perhaps, not yet known, nor can be fully appreciated until the space under the Church of S. Maria Liberatrice be explored; but, although the proceedings are, for the moment, in abeyance, permission to pull down this unimportant building and excavate its site is expected shortly to be obtained.

Among the most interesting discoveries made are those in connexion with the *Sacra Via* itself. We can now follow it from the Arch of Titus, down the slope of the Velia in front of the steps of the Temple of Venus and Rome, bending round by the Basilica of Constantine, and skirting the Temples of Romulus and of Antoninus and Faustina, beyond which, for the present, it disappears under the road to the old houses backing on to the Forum of Nerva. But in front of the Temple of Romulus, immediately before the third pedestal shown in the illustration, the road divides, and the branch appears to be clearly traceable under ancient super-imposed

pavements, past the Temple of Vesta and the front of the Temple of Castor, where, at the angle of this building, it joins the road by the Basilica Julia, where it is crossed by the *Vicus Tusculus*. In the *Times* of the 8th of May last, a very clear sketch plan is given, showing this newly-discovered piece of road.

By the side of this bifurcation in the *Sacra Via* stands what still remains of that archaeological puzzle, the so-called Temple of Romulus, — perhaps more properly named the Temple of the Penates. Until recently, the circular portion of it formed the porch of the church of SS. Cosmo e Damiano, and another part flanked by two marble columns, the upper parts only of which were visible, formed the church of the Amanti di Gesù e Maria. This latter church has now been destroyed, and the remains, cleared of their rubbish and debris, present the plan herein sketched. The round



temple of Romulus is at A, with its entrance at B, having an enriched marble architrave with cornice over, carried by a pair of porphyry columns. This entrance has but recently been reset in its original position and level, it having been altered by Urban VIII. to the position dotted on C, so as to be opposite the connexion made to the Church of SS. Cosmo e Damiano behind, shown at L. At D are two curved brick wing walls, with niches therein spreading to the same width as the temple, and extending forward to what may have been a screen or colonnade added at a later date. Of this colonnade, two columns with their plinths stand erect at E, and at F the plinth only remains *in situ*, whilst the brick foundations of a fourth column are seen at G. The column nearest the wing wall is still surmounted by its capital and cornice complete, and in the illustration, close to the point at which the work of excavation is proceeding, will be seen a corresponding fragment of the entablature. At H are the remains of rough brick foundations, between which, no doubt, were the steps from the level of the *Sacra Via*. On each side of the temple at K was a long apsidal chamber unconnected with the temple itself, and one of the apses remains perfect. How the cornice of the front screen was finished it is difficult to say. That it was carried across from column to column is evident from the worked returns on the portions of the entablature remaining; but the means by which the intermediate parts of the cornice were supported are not now evident. Perhaps a screen wall, like that behind the two columns remaining of the Forum of Nerva, but which has since disappeared, stood immediately in the rear of the columns; and this may have followed the line of the curved wing walls, as between the plinths E and F no foundations have been found beyond those required to support steps.

At the side of the Church of SS. Cosmo e Damiano considerable excavations have been made in the site of the street which ran from the *Sacra Via* up to the Carinae before the erection of the Basilica of Constantine, but we have not space now to enlarge further on these or the discoveries made near the Temple of Vesta, enough, however, has been said to show that just now the works in progress in the Forum, as well as the clearances behind the Pantheon, are of extreme value to all who are interested in Roman archaeology.

Our two illustrations, showing the middle and the top of the *Sacra Via*, are reduced from

views to be published in Mr. J. Tavenor Perry's forthcoming work on Rome, and the above account has also been abridged from his descriptions which accompany the volume.

## ENTRANCE OF THE CASA DELS GRALLAS, BARCELONA.

In the road of Porta Ferrisa, Barcelona, and facing the road of Pi, was erected, in the sixteenth century, the country seat of the family of Grallas, which later passed into the hands of the family of Medinaceli. About the middle of the present century the old mansion was pulled down to make room for a building of modern construction, and, as it appears, simply for reasons of symmetry with its surroundings, not because the modern edifice possessed greater merits than its predecessor. According to a Spanish writer, the old mansion was built in 1518, for Miguel Joan Gralla, professor of philosophy, Barcelona. In the same year, the learned Professor obtained special privileges from the Municipality, in consideration, it is said, of the beauty of the building which he had caused to be constructed, and which formed a conspicuous ornament of Barcelona. To show its importance, the words, "*PUBLICAE VENUSTATI, PRIVATA UTILITATIS*," were carved on the pedestal of the columns supporting the entrance. The architect of the edifice is unknown. The windows of the façade, — six in the entresol, seven in the principal story, — are in the Corinthian style, richly decorated. The entrance, which we illustrate in this week's *Builder*, forms a semicircular arch, resting upon two columns and four pillars profusely ornamented, and supermounted by a rich Corinthian cornice, bearing the arms of the Gralla family. The courtyard of the old edifice was also remarkable. It contained twelve small columns, supporting arches of the Pointed style, and a beautiful staircase leading to spacious halls on the principal floor. This courtyard portion of the old building and the door of its façade, which is the subject of our illustration, have been rebuilt by the Marqués de Casa Brusi, on his estate at San Gervasi de Cassolas. Other portions of the ancient building are preserved in the neighbourhood.

## THE RIGHT OF VENDORS TO KEEP THE PURCHASE-MONEY OF A BUILDING DESTROYED BY FIRE, AS AGAINST AN INSURANCE OFFICE.

It may be in the recollection of some of our readers that, in the course of the years 1880 and 1881, an important case—that of Rayner v. Preston — was decided by the Master of the Rolls and the Court of Appeal. We pointed out, in our comments on that decision, that it was one of great interest to all persons connected with buildings, inasmuch as it finally decided that when the owner of a house has agreed to sell it, and it is burnt down before the actual completion of the contract, yet that the purchaser must pay the full price, and cannot recover from the vendor any sum which the latter may have received from the insurance company in respect of this loss. Of course, the practical effect of this decision was to make the vendor in a better position in consequence of the fire than if it had not occurred, since he gets both the full purchase-money and also the money from the insurance office. We likewise pointed out that, after this decision, no purchaser of buildings was safe, unless he either insured as soon as the agreement to sell was made, or had an agreement with the vendor that he, the purchaser, should have the benefit of his policy.

It was in consequence of this decision that the case now reported — namely, *Castellain v. Preston* ("Law Reports," 8 Queen's Bench Division, 613) — has been brought, being an action by the insurance company against the vendor to recover back the amount paid by the company in respect of the damage to the building, which, so far as the seller was concerned, never, as we have pointed out, was any injury at all to him.

It would serve no useful purpose to delay



giving the decision at which Mr. Justice Chitty, before whom the case was tried, arrived. He held that the insurance company could not recover back the sum they had paid, and therefore, unless this decision is reversed by the Court of Appeal, the vendor in this particular instance will keep both the money of the purchaser and also that of the insurance company, and so may any vendor in future under similar circumstances. We confess, however, to having grave doubts—if we may be permitted to have doubts of a judicial decision—as to the correctness of this judgment of Mr. Justice Chitty. It is so clearly inequitable, so completely against all notions of justice, that we do not believe it can be upheld. In a previous and not dissimilar case, tried in 1880—namely, that of *Darrell v. Tibbitts*, Law Reports, 5 Queen's Bench Division 560—the Court of Appeal held that an insurance company could recover back from the insurer whose tenant, by the terms of his lease, was bound to make good any damage occasioned by a gas explosion, a sum paid to the lessor in respect of such damage. Now, apart altogether from the doctrine of subrogation, which clearly applied to this case, it appears to us that there are passages in the judgment of Lord Justice Brett which cover the present case. For this is what we find in the report:—"The question now arises whether the insurance company, who paid the money to the landlord at a time when they were obliged to pay by virtue of their contract, can recover it back because the tenants have done that which they could not avoid doing? If they had not repaired, they must have paid damages to the landlord. If the company cannot recover the money back, it follows that the landlord will have the whole of his loss as to the building made good by the tenants, and will also have the whole amount of the loss paid by the insurance company. If that is so, the whole doctrine of indemnity would be done away with; the landlord would be not merely indemnified, he would be paid twice over. A technical difficulty arises in my mind as to the ground upon which the landlord can be held liable in this action, but it is a difficulty which ought to be surmounted."

... It seems to me that, according to all rules of law, we have a right to imply a promise on the part of the landlord to the insurance company, at the time of payment by them, that if the loss should be afterwards made good by the tenants, he would repay the money which he received from the insurance company." Now, we confess to some astonishment, seeing the obvious justice of the thing, that Mr. Justice Chitty did not find this passage a sufficient authority to enable him to decide against the seller, without going into all sorts of elaborate discussions upon the doctrine of subrogation, and upon American cases. Because, why should not the Court imply a promise on the part of the seller, at the time of payment by the insurance company, that if the loss should be made good by the purchaser, he would repay the money received from the company? In fact, equity would consider the vendor a trustee for the company of so much of the purchase-money as equalled the sum paid by the insurance company. It seems to us that upon these two short grounds the Court of Appeal will have no great difficulty in reversing the judgment of Mr. Justice Chitty. Otherwise, as Lord Justice Brett said in the passage quoted above, "the whole doctrine of indemnity will be done away with." It is not for us to enter closely into the legal arguments with which this question abounds; but it is one of so much practical importance that it was not possible to pass it by without showing how the law stands at present by reason of the decision in *Bayner v. Preston*, and of the recent judgment of Mr. Justice Chitty in *Castellain v. Preston*; nor, having stated what the law is in consequence of this last judgment, would it have been just to our readers to leave them under the impression that it was likely to remain unaltered by the Court of Appeal.

**The Rowland Hill Statue**, near the Royal Exchange, was unveiled by H.R.H. the Prince of Wales on Saturday last. Mr. Onslow Ford is the sculptor. The statue has been cast in bronze by Messrs. Young, of Pinlicko. The pedestal, which is of Scotch granite from the works of the Dalbeattie Company, bears the inscription,—"Rowland Hill: He Founded Uniform Penny Postage."

#### THE SALE AT KENSINGTON HOUSE.

SINCE Tuesday last Mr. Albert Grant's unoccupied mansion and the grounds attached, at Kensington, have been much crowded with visitors, who have availed themselves of the four days' sale of the materials to make an inspection of the costly mansion which, although erected at such an enormous outlay, has never been permanently occupied, and is now about to be demolished in order to clear the site for other and more available buildings. The materials sold on Tuesday consisted, for the most part, of the fittings of the upper rooms in the central portion of the building, including the thirteen copper baths and the marble chimney-pieces; and these, together with the lead and iron in the roof of the structure, which realised upwards of 1,100l., bought up the proceeds of the first day's sale to upwards of 2,500l. Wednesday's sale, including the magnificent marble staircase, marble columns, the marble terrace outside the rear of the mansion, the fittings of the ball-room, the picture-gallery, and the drawing-rooms, brought together a numerous and fashionable company, in addition to the ordinary dealers in building materials. The great attraction of the day's sale was the grand polished marble staircase, described in the catalogue as being 6 ft. 6 in. in width, and extending from the ground to the second floor, with ornamental white and gilt cast-iron balustrade and bird's-eye maple handrail, the lower landings supported by four Caryatides, 8 ft. high, representing "Spring," "Summer," "Autumn," and "Winter," on polished marble pedestals, 3 ft. 6 in. high. It was stated in the particulars that in the event of the staircase not being sold as a whole it would be divided into lots; but, as it turned out, it was purchased as a whole. The auctioneer, in offering it, said that its original cost was 11,000l. The biddings for it commenced at 500l., and finally the hammer fell at 1,000l., the purchaser being Mr. Williams, who, it was stated in the room, intends introducing it into some buildings which he is now erecting at the West End. The sale of eight Italian marble fluted Corinthian columns followed. They were described as being each in one piece, 15 in. in diameter, 12 ft. 6 in. high, with richly-carved capitals and moulded bases, on massive marble pedestals. They were sold in pairs, and realised 100l. a pair, the auctioneer stating that they cost 1,000l. per pair. The marble terrace at the rear of the building, containing 5,200 superficial feet, was sold for 130 guineas, and following upon this the materials in the ball-room were disposed of, four pairs of fluted Italian marble Corinthian columns, each in one piece, and 12 ft. 9 in. in height, realising 126l. per pair. The total number of lots sold during the day was 160, and the proceeds of the sale 3,600l. On Thursday the materials in the morning-rooms and cloak-rooms, the billiard-room, library, and banqueting-room were sold. The carcass of the building, in Portland stone, will be disposed of in about a month.

#### THE OXFORD MILITARY COLLEGE, OXON.

THE annual Speech-Day of this institution, which prepares candidates for Woolwich, Sandhurst, Home and Indian Civil Service, took place on the 21st inst. Lord Wavenny, in the absence of H.R.H. the Duke of Connaught, who wrote to express his regret at not being able to attend, gave away the prizes to the successful competitors for military proficiency. Letters of regret were likewise read from Lords Hertford and Jersey, Colonel Sir Robert Lloyd-Lindsay, Bishop Cloughton, and many others. His lordship was seconded by General Burnaby, M.P., and Colonel T. Duncan, R.A.

The proceedings commenced with an inspection of the students on parade. After the riding, sword, lance, and carbine exercises had been gone through, the reports of the governor (General Desborough) and the disciplinarian (Colonel Macartney) on the military studies were read. The sword of honour given by Colonel Sir Robert Lloyd-Lindsay to the student passing highest into Sandhurst and Woolwich was awarded to Mr. Reade; and another sword, given for military proficiency by Lord Wavenny, was awarded to Mr. Hibbert. His lordship addressed the students at some length, and said that he was glad to find so much stress was laid by the college authorities upon the study of

modern languages, the importance of which could not be well over-rated now-a-days. He complimented the students upon the able manner in which they had performed the various military exercises.

General Burnaby, M.P., said he, too, attached the greatest importance to the study of modern languages by military men, particularly that of French and German. Colonel Duncan said he was sure that if marks were given by the examiners for physical training, the students from this college would have a great advantage over those coming from other institutions. General Lorry proposed a vote of thanks to Lord Wavenny.

#### THE METEOROLOGICAL SOCIETY.

THE closing meeting of this society for the present session was held on the 21st inst., at the Institution of Civil Engineers, Mr. J. K. Laughton, F.R.A.S., president, in the chair. The first paper read was on "A new Metal Screen for Thermometers," by the Rev. F. W. Stow, M.A., F.M.S. This screen differs from the ordinary Stevenson in the following respects:—(1) It is somewhat larger; (2) it has a single set of double zinc louvres; (3) it is partially closed at the bottom, to cut off radiation from the ground. The advantages claimed for the use of zinc louvres are:—(1) The conductivity of metal causes the heat derived from the sun's rays to be distributed over every part of the louvres. (2) The louvres being much thinner than those of wood, the circulation of air through the screen is not only much greater absolutely, but much greater also in proportion to the bulk of the louvres. (3) The zinc louvres, therefore, are much more sensitive to changes of temperature than wooden ones. Comparative readings of thermometers in this screen, along with those in an ordinary Stevenson screen, were made during the summer of 1881. From these, the author is of opinion that the Stevenson becomes unduly heated when the sun shines, but this may be as much due to its small size as to the material of which the louvres are made. The thermometers in it are only 3 to 5 in. from the louvres at the back of the screen, against 7 to 8 in. in the zinc screen. The roof, too, is single, and the box is open at the bottom. The author also says that there is no need to condemn all wooden screens, but there does seem to be some reason to think that screens with metal louvres might be better.

#### THE SOUTH-EASTERN RAILWAY COMPANY AND THEIR BRIDGES IN SOUTH LONDON.

THE Newington Vestry are carrying their opposition to the Bill of the South-Eastern Railway Company (so far as it refers to the construction of new bridges within the parish) before the Committee of the House of Lords, with the view, more especially, of compelling the railway company to make the bridges absolutely water-tight. At the last meeting of the Vestry, the Works and Sanitary Committee recommended that a petition be presented to the House of Lords against the Bill as passed by the Committee of the House of Commons, with the view of amending the clause as inserted in the Bill for making the bridges water-tight, by striking out the words introduced by the Committee of the House of Commons, "or as nearly so as practicable." Mr. Marsland, in moving the adoption of the report, said he could not see how the Committee of the House of Commons allowed such impracticable words to be introduced in the Bill as "or as nearly so as practicable," for should the Bill finally receive Parliamentary sanction with those words in it, the vestry would have no security that the bridges would be water-tight, and the parish would in all probability be subject to the same nuisance from those dripping bridges which it had to endure for several years past. He therefore thought that they had very good grounds for appealing to the House of Lords. The recommendation was agreed to.

**Josiah Wedgwood.**—Mr. William J. Stuart delivered an interesting lecture before a large and appreciative audience, at his residence, in Gloucester-terrace, Hyde-park, on Wednesday, the subject being "Josiah Wedgwood, the Great Art Potter, and his Works."



## STRAWBERRY HILL.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

A MONTH ago we referred (p. 627, ante) to the rumour that this pleasantly-situated and curious house,—interesting not only in itself but from its associations with Horace Walpole, whose summer residence it was for half a century,—was sold, or was about to be sold, to an American company, who intended to convert it into an hotel. We understand that this rumour is well founded, and while we cannot but sympathise with the lamentation of a local journal that “no Englishman of opulence and culture can be found ready to secure the noble honour” of making the building his own, we think that the Architectural Association were well advised in taking advantage of an opportunity which offered itself last Saturday for making a special visit to a building of which they had often heard or read. It is true that references to it were, for the most part, significant of contempt for Horace Walpole’s dabbling in Mediæval or quasi-Mediæval architecture, but, nevertheless, Strawberry Hill has some claims to regard as a curious precursor of the Gothic revival, and it is not surprising that a goodly number of the members of the Association took the opportunity of going over the house on Saturday last, under the guidance of Mr. Maurice B. Adams, who read some interesting notes on its chief features and associations, first of all quoting Horace Walpole’s own description of it, in a letter addressed to Sir Horace Mann, and dated June 6th, 1747,—

“Where the Gothic castle now stands was originally a small tenement, built in 1698 by the Earl of Bradford’s coachman, and let as a lodging-house. Gibbon once took it, and wrote one of his plays here,—‘The Refusal’; or, the Lady’s Philosophy.” After him, Talbot, Bishop of Durham, had it for eight years; then Henry Bridges, Marquis of Carnarvon, son of the Duke of Chandos, and since, the Duke himself. It was next hired by Mrs. Chevenix, the noted toy-woman, who, on the death of her husband, let it to Lord John Philipps, second son of Lionel, Duke of Dorset; he kept it about two years, and then Mr. Walpole took the remainder of Mrs. Chevenix’s lease in May, 1747, and the next year bought it by Act of Parliament, it being the property of three minors of the name of Mortimer.

“I may retire to a little new farm that I have taken just out at Twickenham. The house is so small that I can send it to you in a letter to look at. The prospect is as delightful as possible, commanding the river, the town, and Richmond Park; and being situated on a hill, descends to the Thames through two or three little meadows, where I have some Turkish sheep and two cows,—all studied in their colours for becoming the view. This little rural bijou was Mrs. Chevenix’s, the toy-woman *à-la-mode*, who, in every dry season, is to furnish me with the best rain-water from Paris, and was then with some Dresden-china cows, who are to figure like wooden clowns in a library,—so I shall grow a shepherd as any swain in the *Astrea*.”

Again, in a letter dated June 8th, 1747, addressed to the Hon. H. S. Conway (“Letters,” vol. ii., p. 86), Walpole says:—

“You perceive by my date that I have got into a new camp, and have left my tub at Windsor. It is a little plaything house that I got out of Mrs. Chevenix’s shop, and is the prettiest bauble you ever saw. It is set in enamelled meadows with filigree hedges.

“A small Euphrates through the piece a roll’d,  
And little fountains wave their wings of gold.”

Two delightful roads, that you will call dusty, supply me continually with coaches and chaises; barges, as solemn as Barons of the Exchequer, move under my window; Richmond Hill and the Ham Walks bound my prospect, but thank God! the Thames is between me and the Duchesses of Queensberry. Dowagers as plenty as flounders inhabit it all round, and Pope’s ghost is just now under my window by a most poetical moonlight.”

Writing to George Montagu, under date May 11, 1769, Walpole says:—

“Strawberry has been in great glory; I have given my *fistino* that will almost mortgage it. Last Tuesday all France dined there: Monsieur and Madame du Châtelet, the Duc de Lincourt, three more French ladies whose names you will find in the enclosed paper, eight other Frenchmen, the Spanish and Portuguese ministers, the Holdernesses, the Fitzroys,—in short, we were four and twenty. They arrived at two. At the gates of the Castle I received them, dressed in the cravat of Gibbon’s carving, and a pair of gloves embroidered up to the elbows, that belonged to James I. The French servants stared, and firmly believed this was the dress of English country gentlemen. After taking a survey of the apartments, we went to the Printing

House, where I had prepared the enclosed verses, with translations by Monsieur de Lille, one of the company. The moment they were printed off, I gave a private signal, and French horns and clarionets accompanied this compliment. We then went to see Pope’s Grotto and the garden, and returned to a magnificent dinner in the refectory. In the evening we walked, had tea, coffee, and lemonade in the Gallery, which was illuminated with thousand candles,—or thirty, I forget which,—and played at whist and loo till midnight. Then there was a cold supper, and at one the company returned to town, saluted by fifty nightingales, who, as tenants of the manor, came to do honour to their lord.”

Mrs. Chevenix’s house, Mr. Adams proceeded to say, was little more than a cottage, and the grounds were very limited. In 1750 Walpole determined “to build a Gothic castle at Strawberry Hill,” and asked Sir Horace Mann to pick him up “any fragments of old painted glass, arms,—anything,—if there are such things to be found amongst the old châteaux of Italy.” The picturesque and straggling character of the house is due to the fact that the work was carried on piecemeal, it being its author’s most serious occupation, and he set about the erection in a most systematic manner. He was his own architect, Bentley acting as his draughtsman.† Before commencing he visited cathedrals, castles, manor-houses, and colleges, and copied all and every feature which seemed to afford any pattern for any portion of his new home. Groined roofs, cloisters, screens, tombs, windows, doorways,—anything,—was borrowed from Westminster, Durham, St. Alban’s, Lincoln, Salisbury, Winchester, Oxford, or Cambridge, to be repeated at Strawberry Hill. The picture-gallery, for instance, has a ceiling copied in an elegant way from Henry VII.’s Chapel at Westminster;‡ the detail on the scale here applied being well suited for plaster. The north door of St. Alban’s Abbey afforded a model for the entrance to this apartment, while Archbishop Bourchier’s tomb at Canterbury was imitated, after an adapted fashion, for the rich decoration on one side of this room,—Walpole’s *chef d’œuvre*. His garden-gate piers were taken from those in the choir of Ely Cathedral; and Bishop Dudley’s tomb, to take another instance, furnished Walpole with an idea for the chimney-piece in the north bed-chamber,—now a sitting-room. He also was in several instances guilty, it was said, of bodily appropriating fragments of any original old building, so that the jewels of ancient Gothic work might be set in his toy building, but Mr. Adams said he had been unable to discover any of these in the building as it exists at present. The house was originally entered from the

\* Isaac Disraeli, in his “Calamities of Authors,” says, speaking of Walpole:—“He raised a printing-press at his Gothic castle, by which means he rendered small editions of his works valuable to the rarity and much talked of, because seldom seen. That this is true appears from the following extract from his unpublished correspondence with a literary friend. It alludes to his ‘Anecdotes of Painting in England,’ of which the first edition only consisted of 300 copies.—‘Of my new fourth volume I printed 600; but as they can be had, I believe not a third part is sold. This is a very plain reason to me, that my editions sell for their curiosity, and not for any merit in them,—and so they would if I printed ‘Mother Goose’s Tales,’ and but a few. If I am humbled as an author, I may be vain as a printer; and when one has nothing else to be proud of, it is certainly very little worth while to be proud of that.’”

† Bentley, the son of Dr. Bentley, who ornamented Gray’s works with some extraordinary designs. Walpole, who was always proud and capricious, observes his friend Cole, broke with Bentley because he would bring his wife with him to Strawberry Hill. He then asked Bentley for all his letters back, but he would not in return give Bentley’s own.—*Ibid.*

‡ Of King’s College Chapel, Cambridge? Disraeli, after referring to Walpole’s “literary confessions,” says,—“There were times when Horace Walpole’s natural taste for his studies returned with all the vigour of passion,—but his reluctance and his desultory life perpetually scattered his firmest resolutions into air. This conflict appears beautifully described when the view of King’s College, Cambridge, throws his mind into meditation, and the passion for study and seclusion instantly kindled his emotions, leading, perhaps, as long as the letter which describes them occupied in writing.”—May 22, 1777. The beauty of King’s College, Cambridge, now it is restored, penetrated me with a visionary longing to be a monk in it. Though my life has been passed in turbulent scenes, in pleasures or other pastimes, and in much fashionable dissipation, still, books, antiquity, and virtue kept hold of a corner of my heart; and since necessity has forced me of late years to be a man of business, my disposition tends to be recruited for what remains,—but it will not be my lot, and though there is some excuse for the young doing what they like, I doubt an old man should do nothing but what he ought, and I hope doing one’s duty is the best preparation for death. Sitting with one’s arms folded to think about it is a very long way for preparing for it. If Charles V. had resolved to make some amends for his abominable ambition by doing good (his duty as a king there would have been infinitely more merit than going to doze in a convent. One may avoid actual guilt in a sequestered life, but the virtue of it is merely negative; the innocence is beautiful.

road, but is now set back owing to the road being extended beyond, and a new entrance has been added. The west wing is where Walpole set up his printing-press, and this is a battlemented building lighted by square windows divided by modern casement-frames, with imitation Tudor drip-stones over. Mrs. Chevenix’s cottage forms the oldest part, and is that portion situated nearest the Thames. This has two fronts, south and west, with a semi-octagonal porch on either side; and Walpole’s taste for Venetian Gothic is here displayed in the pointed windows, terminating as they do in an ogival curve. There are two stories of these windows, and no arch joints are visible, the plaster being carried to the edge of the intrados. The upper floor is lighted by quatrefoil openings, most of which are now covered by crockers, and the crowning feature consists of an embattled parapet, executed in lath and plaster, and having wooden pinnacles at the angles. A large round tower, over the Round Drawing-room, at the western end, with a stair turret, is connected to the original building by the picture gallery, which runs east and west. This room is 56 ft. long, 17 ft. high, and 13 ft. wide. The windows contained all the quarters of the family. The carpet was made at Moorfields, and the walls lined with Walpole’s best historical pictures, with rich and rare sculpture on pedestals and tables in the alcoves of the tracered openwork, and with Lady Walpole’s antique china in a closet of glass. The Waldegrave beauties, forming what is probably an unrivalled collection of contemporary portraits of noble ladies, are now hung in this gallery. They are all from the brush of Mr. Sant, R.A., and include the Duchess of Sutherland, the Marchioness of Stafford, the Duchess of Westminster, the Countess of Shaftesbury, and many others. The Princess of Wales occupies the place of honour at the royal end of the gallery. The present study, at the east corner of the south front, was the Refectory, and is lighted by a bay window surmounted by a cresting of wood. Over this apartment is the Library, which is for the most part in the same condition as it was left by Horace Walpole. The books (15,000 in number) are still arranged in presses with Gothic arches of pierced work, taken from the side door-case in Dingle’s “St. Paul’s”; and above, are portraits hung as Walpole is believed to have hung them. The ceiling, in very good preservation, was painted from Walpole’s design, drawn out by Bentley, his draughtsman, and executed by Clermont, with all the shields, symbols, and devices described by their author with so much parental fondness. The chimney-piece is from a tomb at Westminster; and the stonework from Canterbury. The great North Bed-chamber is now a sitting-room, as already remarked, and is richly furnished. It has a cheerful outlook, but must have been a most uncomfortable room to sleep in, every inch of space being occupied with china and curiosities. The breakfast-room, where Walpole displayed a large part of his almost world-renowned collection of miniatures,—including fine examples by Pettit, Zincke, and other masters,—was lately used as Lady Waldegrave’s morning or garden room. The staircase, at the lower entrance, has been made more commodious, pictures taking the place of Walpole’s collection of old arms and armour of François Première date; and Noble’s statue of the Countess of Waldegrave now graces the landing. Besides the rooms which have already been named may be mentioned the China Room, which contained an exceedingly varied “collection of porcelain, earthenware, glass, and enamel on copper, of various ages and countries.” The gossipary in which Walpole fondly lingers over his treasures is often very amusing, and the following may be quoted as a specimen:—

“Two Saxon tankards,—one with Chinese figures, the other with European. These tankards are extremely remarkable. Sir Robert Walpole drank ale; the Duchess of Kendal, mistress of King George the First, gave him the former. A dozen or more years afterwards, the Countess of Yarmouth, mistress of King George the Second, without having seen the other, gave him the second; and they match exactly in form and size.”

The “Little Parlour,” with its chimney-pieces “taken from the tomb of Thomas Ruffall, Bishop of Durham, in Westminster,” is over the Breakfast Room. The Yellow Bed-chamber, or “Beauty Room,” may also be mentioned. This apartment contained portraits of the celebrated, if not very virtuous, beauties of the



Court of Charles II., but these were sold at the great sale. Beyond these, past the staircase and the breakfast-room, was the Green Closet, which contained the greater part of the collection of old bronzes, wax models, old glass curiosities, and Venetian dram-bottles, belonging to Mrs. Kennon, the *virtuoso* midwife, together with Hogarth's portrait of Sarah Malcolm, and other similar things, over which Walpole would favour his visitors with gossip by the hour. The Blue Bed-chamber and the Red Bed-chamber contained more china. The Plaid Bed-chamber, and Walpole's own room, may be named; also the Star Chamber, with its ugly modern glass, where the bust model in stone of Henry VII., by Torrigiano, for the king's tomb at Westminster, was shown. Several interesting views of the old house are now hung in this apartment. The Holbein Chamber was so named on account of its having contained traced copies by Vertue from the Holbein originals at Buckingham House; and among many other curious fragments and singular conceits, more or less historic, kept here, was Cardinal Wolsey's hat, which at the sale was purchased by Charles Kean, the actor, for twenty guineas. The open-work screen at the entrance to this room, forming a kind of lobby, is very noticeable. The Round Drawing-room was 22 ft. in diameter, having a large bay window, enriched by the Earl of Leicester's arms, and the costly chimney-piece here is said to have been "taken from the Tomb of Edward the Confessor," and improved by Adam, the architect. It is beautifully executed in white marble, inlaid with scagliola by Richter, and this elaborate and exquisitely-finished work may still be examined and admired *in situ*. The room was hung with crimson damask of Norwich make, and contained Vandyck's celebrated portrait of Lady Dorothy Percy, Countess of Leicester, and her sister, the Lady Lucy, the famous Countess of Carlisle, for which Walpole gave only twenty-nine guineas at the Penshurst sale. It was sold at the Strawberry Hill sale for 231., and now, of course, would secure a very much higher sum. The curious room known as the "Tribune" contained the larger portion of Walpole's miniatures. It is "a square recess with semicircular recesses in the middle of each side," and with a lofty domed ceiling executed in plaster. Snuff-boxes, chalices, apostle-spoons, the bell made for the Pope by Cellini for the ceremony of exorcising of caterpillars, antique lamps, seals, and trinkets, were here displayed. The "Beauclerk Closet," built in 1776, was equally well stored, and contained the drawings of Lady Diana Beauclerk for Walpole's tragedy of "The Mysterious Mother." Besides the house was the chapel, the combined production of Walpole, Bentley, and Chute, hatched up from various details copied from various cathedrals. The greatest length inside is 15 ft., including the porch, and its width is 8 ft. The plan is a quaterfoil, of which three sides are roofed in the form of groins in plaster, the fourth side being utilised as the porch. A pendant hangs from the quadrilateral space in the centre of the ceiling. Slender columns separate the sides and form recesses on the three faces. The front is said to have been copied from a tomb at Salisbury, and is executed in Portland stone in a characteristic manner, and the carving, like the rest of the work, is decidedly meritorious, considering the period of its erection, and more care seems to have been given to the style of its detail than in the house itself. The chapel will scarcely hold a dozen people. The Tea-room or cottage in the garden contained many fine old prints, and much Oriental porcelain. Walpole lived at Strawberry Hill during the summers of nearly fifty years, and he bequeathed the estate to the Hon. Mrs. Damer, who occupied the place from the year of his death, 1797, till 1811, when, after doing her best to keep up its old character, she resigned it to the Dowager Countess Waldegrave, who held the reversion; at this time everything remained as Walpole had left it. The house was soon allowed to get out of repair, and eventually was sold by George Robins, the auctioneer,—the sale occupying twenty-four days. Some years later it was rescued from the ruinous condition into which it had fallen by Frances, Countess Waldegrave, who restored the place and added a new wing, reinstating the place. The smaller rooms in the old building have in several cases been converted into bedrooms, but the reception and state apartments are still so used, and a good

number of the decorations remain intact. The new west wing was added by the Countess about 1860-62, and consists of dining-room, drawing-room, and billiard-room. Reynolds's celebrated group of the three Ladies Waldegrave, daughters of the second Earl, hangs in the drawing-room. It was painted for Horace Walpole, costing him 800 guineas.

The visitors accompanied Mr. Adams over the house, and had an opportunity of noticing the quaint stoves and mantelpieces, all being "after the Gothic manner" as it was understood by Walpole, and no two being alike. These, and the interesting fragments of stained glass inserted in the windows by Walpole will, we understand, "go with the house," whose future possessors will, it is to be hoped, leave them undisturbed. After spending some little time in inspecting the art-treasures of the house, the visitors proceeded to the small chapel in the grounds, as to the architecture of which the general opinion was that it was much more Gothic in feeling than a great deal of work done long subsequently to it. It is at present disused, but the external stonework appears to be well preserved. A vote of thanks having been accorded (on the motion of Mr. W. H. Atkin Berry) to Mr. Adams for acting as *cicerone*, the visitors left this old house thankful for the "happy thought" which suggested the visit.

#### PROPOSED NEW PUBLIC BUILDINGS AT MIDDLESBROUGH.

At the monthly meeting of the Middlesbrough Town Council held last week, the Mayor (Alderman Archibald) presiding, Alderman Bulmer moved the adoption of the minutes of the Streets and Building Committee, which included the following:—

"That the architect to whom the first prize for the proposed public buildings has been awarded be communicated with at once, and an appointment made for him to meet the Building Committee at an early date in order to arrange terms for his carrying out the plans after making such alterations therein as may be necessary; and that the committee be authorised to obtain tenders for the work in connexion with the foundations of the buildings other than the town-hall, and submit them for confirmation by the Council. That the committee be empowered to get the quantities taken out, and appoint a clerk of works if necessary."

Mr. Bulmer stated that Mr. Waterhouse had awarded the three premiums for the best designs to "Law and Order," "Experia," and "Tees" respectively.

The Town Clerk then opened the envelopes bearing these mottoes, and found that "Law and Order" was Mr. G. G. Hoskins, Darlington; while "Experia" was Messrs. G. Nichols & Sons, Albert-buildings, Queen Victoria-street, London; and "Tees" the winner of the third premium, was Mr. Lacy W. Ridge, Woburn-place, London.

A discussion took place as to whether the names of the unsuccessful competitors should be disclosed, and it was decided that they should not be made known.

Alderman Williams was opposed to tenders being obtained until the committee had had time to consider how the work should be proceeded with. He moved that the Public Buildings Sub-Committee deal with the question fully, and report as to the best course to be pursued.

Councillor Mildred seconded this amendment, which was carried by the casting vote of the chairman.

The estimated cost of the proposed buildings is 70,000l.

**Markets, Liverpool.**—At a meeting of the Liverpool City Council on Wednesday, a recommendation was made by the Markets Committee that they be authorised to negotiate for the purchase of the site in Great Charlotte-street and Rose-street, containing about 2,284 square yards (referred to in the report of the Corporation Surveyor of March 14, 1882), for the purpose of the erection thereon of a wholesale market for the sale of fish, shellfish, and dead poultry, the consideration of which was postponed by the Council on April 5, 1882. This recommendation, which involves an outlay of 40,000l., was, after a great deal of discussion, eventually referred to a special committee for consideration, together with another recommendation from the Markets Committee as to the rebuilding of the south end of St. John's Market, at a cost not exceeding 7,000l.

#### PROPOSED LUNATIC ASYLUM FOR EXETER.

THE Exeter Town Council have had under consideration for some time past the advisability of erecting a lunatic asylum for the city, as the County Asylum at Exminster is not nearly large enough to receive all the city patients, and many have, therefore, to be sent to Fisherton House, Salisbury. At the last visit of the Visitors of Pauper Lunatics to Fisherton there were forty-eight male and thirty-nine female pauper lunatics confined there chargeable to the city. At length the Council determined to build an institution in or near the city, and a site was acquired at Digby's, Heavitree. Plans were then invited, and premiums offered for the best designs, as follows:—First, 100l.; second, 50l.; and four of 25l. each. About forty designs were sent in, from all parts of the kingdom, for competition. Professor T. Hayter Lewis was appointed to adjudicate upon them. The preliminary sketch designs were displayed in the upper room of the Victoria Hall, for the inspection of the assessor, who selected for the final competition eight plans, bearing the following mottoes, with the estimated cost then set against each of them:—"Stet," 42,000l.; "Nota Bene," 29,500l.; "Experientia," 41,500l.; "Cumi," 41,519l.; "Isca Dammonius," 47,257l.; "Mens," 51,444l.; "Light and Shade," 31,500l.; and "Deo non Fortuna," 44,984l. The highest estimate was 80,000l., and the lowest 29,100l. The assessor fixed the 12th inst. as the last day for receiving the plans in the second competition, and he attended in Exeter on the 13th and 14th inst., to finally examine them, and make his selection for the premiums offered. We learn that he has selected those marked "Stet" for the first premium, and "Mens" for the second, and the following for the four premiums of 25l. each, arraying them in alphabetical order according to the mottoes, viz.,—"Deo non Fortuna," "Isca Dammonius," "Light and Shade," and "Nota Bene." The author of the designs marked "Stet" is Mr. R. S. Wilkinson, of Furnival's Inn, Exeter and Torquay. In his plans, accommodation is provided for 300 patients, and the original estimate has been increased by 2,000l.; in fact, the approximate cost of nearly every design appears to have been altered since it was first submitted. The author of the second premiated design is Mr. A. W. Kershaw, of Lancaster, and his final estimate was 52,032l. The cost and authors of the other plans which were awarded 25l. each were as follows:—Messrs. Hine & Marshall, Nottingham, "Deo non Fortuna," 41,730l.; Mr. E. Ashworth, Exeter, "Isca Dammonius," 55,000l.; Mr. B. Lyssaght, Bristol, "Light and Shade," 36,044l.; and Mr. J. M. Pinn, Southernhay, Exeter, "Nota Bene," 29,500l. The authors of the two remaining designs were architects of Birmingham and Hull, and the expense of carrying out their plans was estimated at 44,000l. and 41,500l.

#### SALE OF A BUILDING SITE IN EASTCHEAP.

LAST week Messrs. Fox & Bousfield submitted for sale, at the Auction Mart, a freehold property, being the premises Nos. 2, 3, and 4, Cross-street, Eastcheap, containing a building area of 4,250 superficial feet. The existing buildings on the site were stated to be three stories in height, having large office and warehouse accommodation, but the premises were represented as not adequately utilising the land, which from its extent and position was one of the best undeveloped building sites in the City, the value of which would be much increased by the execution of the intended improvements by the formation of the new street and the construction of the Inner Circle Railway. The auctioneer, in offering the property, stated that land in the immediate locality was recently sold at 10l. per foot. The first offer for the property was 7,000l., and it was ultimately sold for 11,000l., the auctioneer observing that the purchase-money was much below its value, as 15,000l. had been offered and refused for it a short time ago, but that the property was now offered for absolute sale.

**A Group of Ten Almshouses** has been erected at Bowling, for Sir Henry W. Ripley, bart., from the designs of Mr. Jas. Ledingham, architect, Bradford.



## BUILDING PATENTS.\*

## APPLICATIONS FOR LETTERS PATENT.

- 2,710. G. Anderson, Arbroath. Machines for cutting and dressing stone. June 9, 1882.  
 2,717. J. Casey, London. Water-closet apparatus. June 9, 1882.  
 2,718. T. Ogden, Burnley. Stoves and fireplaces. June 9, 1882.  
 2,772. R. W. Hutchins, London. Machinery for making slabs of plaster, for ceilings, &c. June 13, 1882.  
 2,783. H. J. Haddon, London. Machinery for cutting and dressing stone. (Com. by J. P. Korschilgen, Berg, Germany.) June 13, 1882.  
 2,794. C. Hulseberg, London. Boilers for heating greenhouses and buildings by hot water, &c. June 14, 1882.  
 2,806. S. Deards, Harlow. Securing sheets of glass, &c., for roofing purposes. June 14, 1882.  
 2,815. A. B. Brown, Edinburgh. Ventilating, &c. June 15, 1882.  
 2,829. R. R. McKee, Kirkcaldy. Water supply and apparatus for flushing drains. June 15, 1882.  
 2,834. A. M. Clark, London. Water-closets, &c. (Com. by J. J. B. Frey, New York, U.S.A.) June 15, 1882.

## NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

June 13, 1882.

615. J. H. Miles, Southampton. Construction of window-sash and door frames. Feb. 8, 1882.  
 658. A. McLean, London. Slabs or panels for decorative purposes. Feb. 10, 1882.  
 950. W. P. Bonwick, London. Window-fastenings, &c. Feb. 27, 1882.  
 2,357. T. W. W. Barrett, London. Apparatus for enabling persons to ascend to the tops of chimney-stacks, church spires, &c. May 19, 1882.

June 16, 1882.

652. J. Stainer, Heckmondwike. Apparatus for lifting stones, bricks, &c., on to scaffolding. Feb. 10, 1882.  
 654. T. Fraser, Aberdeen. Linings for chimneys or vent flues, &c. Feb. 10, 1882.  
 786. J. M. Lamb, London. Ventilators and chimney-cowls. Feb. 18, 1882.

## ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending June 17, 1882.

- 4,745. R. T. Gillibrand, Darwen. Apparatus for heating water, &c.

This is chiefly applicable for heating buildings, &c. A boiler containing a furnace is connected by a steam or hot water pipe with another boiler, and a flue carries the products of combustion from the furnace to the second boiler, where the smoke, &c., is fired and consumed in the flues of this boiler. Oct. 29, 1881. Price 6d.

- 4,796. G. H. Jennings & S. Jennings, London. Lavatories, &c.

The tipping-basins here pivots on their sides, by which they are mounted in U-shaped recesses, and retaining flanges are fitted so that they can only be lifted out when horizontal. Nov. 2, 1881. Price 6d.

- 4,878. J. P. Bayly, London. Bricks.

These are made with a tenon, dovetail shape, on the bottom and on the top a recess to receive a similar tenon on the brick of the next course. (Pro. Fro.) Nov. 8, 1881. Price 4d.

- 4,927. E. de Pass, London. Manufacturing artificial stone.

The stone is made of sand, amorphous silica, quicklime, and water. These are mixed together and moulded by ramming into the required shape, and allowed to set. The blocks are then placed in tanks of water and heated up to 200 degrees Fahr., when they are ready for use. (Com. by H. Stone, Brighton, Victoria.) Nov. 10, 1881. Price 4d.

- 4,929. H. J. Haddon, London. Stoves.

The body of the stove is formed of two concentric cylindrical shells, the inner one containing the firegrate and up-pipe, and the annular space between the two being filled with hot air moistened by the evaporation of water, which is placed in the base of the stove. (Com. by J. Schneur, Paris.) (Pro. Fro.) Nov. 10, 1881. Price 2d.

- 4,941. W. Cunningham, Dundee. Ventilating apparatus.

Two rotating propellers are used similar to those known as "Root's blowers." These are on parallel shafts and are driven by belt. Nov. 11, 1881. Price 8d.

- 4,953. H. W. Yates, Brighton. Ventilators for chimneys, &c.

The body is a cylindrical pipe. Above this is the head, which is a frustum of a cone open at top and bottom, and raised a little above the top of the body. The bottom of the cone is larger than the body, and the top is smaller. Nov. 12, 1881. Price 4d.

- 4,971. C. W. Toor, Birmingham. Gas-stoves.

The body is made of terra-cotta. In the bottom of the

\* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

case is the burner, and tubes of terra-cotta, open at both ends, cross the stove in an inclined plane, in which the external air is heated. Nov. 12, 1881. Price 6d.

- 5,003. H. Barron & H. Raimes, London. Water-closets, &c.

A cistern is fitted for the liquid disinfectant, which is delivered into the pan when the handle is lifted. A roller is fitted, round which is wound a cover for the seat, which can be used when required. Nov. 15, 1881. Price 6d.

## THE MOISTENING OF AIR IN FACTORIES.

ONE of the leading organs of the textile industry on the Continent remarks that in spinning and weaving establishments (for cotton, wool, flax, &c.), it is a point of the first importance to maintain the air at a sufficiently high and uniform degree of moisture, to ensure a maximum of production of yarns or cloths of smooth and lustrous appearance, the continued influence of too dry an air being injurious to the quality and restricting the quantity of the out-turn. Many improvements have, therefore, from time to time been tried with a view of remedying the evil.

In winter a jet of fresh steam is usually sufficient, but in summer this means is only applicable to certain industries, while a considerable part of its efficacy is lost by the greater amount of ventilation necessitated by the higher temperature of the season.

Messrs. Koerting's system consists in the introduction of the air which has passed through a column, where a stream of water has been introduced by an appliance similar to a watering-pot. The degree of humidity can be regulated, and thus, it is remarked, the solution of this important question has been arrived at.

## PRISONERS' EARNINGS.

In an interesting account of Lewes Gaol, which is given in the *Sussex Advertiser*, the writer says at the close:—

The prison was originally fitted with 265 cells. Some fifteen years ago the influx of prisoners from Brighton assumed such formidable proportions that it was judged expedient to add another 132 cells, at a cost of about 12,600*l.*, raising the total cost of construction to near 70,000*l.* There are 397 cells, but as many are appropriated to special uses, 300 prisoners is considered about the complement of the establishment. At the present time the prison harbours only about 200. As in other gaols, prisoners sentenced to hard labour are allowed to improve their lot and advance into higher stages by earning "marks," up to 2,600. Insubordination or other offences will forfeit such marks. Prisoners are also allowed to earn some money, but only very little, a few pence a week, and the maximum earnings, whatever their time of detention, do not exceed 10*s.* The marks and pence are earned mainly by mat-making, which is a peculiar feature of the prison, an industry introduced while the gaol was still under the magistrates' control as a county prison, owing chiefly to the advocacy and personal application of Mr. B. Godlee, a resident magistrate. On a small scale it had been practised before Mr. Godlee's special efforts, but under his direction it was materially extended some fifteen years ago and developed into a, comparatively speaking, highly remunerative and useful industry. Under Government management it appears to have been pursued with rather less energy. At the present time the mat-making employs about sixty men, partly at frames, partly at looms. There is a separate gallery set apart for this work, in which the prisoners are variously employed, each in his own cell, open at the top, so as to admit of the warden's inspection from a raised platform dividing the two rows. Some prisoners are also allowed to do the twining in their own cells. The tools employed for this work are all marked, and prisoners are made responsible for what is served out to them. The mats are manufactured in considerable quantities, and in great variety; also of excellent quality. The manufacture yields a considerable profit, amounting to about 700*l.* in the past year, but to considerably more in some previous years. Considerable quantities of cocoanut fibre are required for the purpose. They are, as a rule, supplied in bales of twine, and the manufactured article is disposed of either in the neighbourhood, or else by wholesale delivery to London houses. There are undoubtedly certain drawbacks attending the introduction of a manufac-

turing industry within prison walls. But, on the other hand, the employment of prisoners on profitable work is generally considered not only permissible but advisable on more grounds than one. A political economist's mind rebels against the notion of so many hands being applied only to the useless labour of turning cranks or treadmills, an employment, moreover, deadening to the workman's mind, and very apt to produce stolid resentment rather than to suggest honest work out of gaol, while, on the other hand, the country is laid under heavy contributions to support these institutions. Again, no text is more persistently harped upon by volunteer-preachers than that we should endeavour in our prisons not only to punish, but to teach, teach honest work, habituate to regular employment, occupying body and mind. For this purpose industrial work affords the best and most acceptable means. There is the bugbear of competition with tradesmen, of course. The objections raised on this score are, however, few. Lewes Gaol does not stand alone in the cultivation of useful industrial work, but ranks among the most successful of manufacturing prisons; and altogether it is rarely, if ever, visited by prison experts from our own county or abroad, but its arrangements, régime, and administration elicit praise as models for imitation.

## ST. PETER'S HOSPITAL, HENRIETTA-STREET, COVENT-GARDEN.

This new hospital, intended for treatment of a special disease, is to be opened by H.R.H. Prince Leopold, on June 29th. It will contain forty beds, and large accommodation for out-patients. The total cost of the building and site will be 13,500*l.*, in addition to 1,000*l.* for furniture and fittings, of which 3,000*l.* are still required. The committee are appealing for assistance.

## A FIREPROOF CEMENT.

A PERFECTLY fireproof cement, it is asserted, has been discovered in the Eifel Mountains, and has recently been analysed by the German chemist, Dr. Bischof, of Wiesbaden. According to the opinion expressed by professional men, it is the only material known to science which possesses, besides its plastic qualities, the virtue of being fireproof. Moistened with water, this cement forms into an elastic mass, which can be exposed, when dry, to great heat, without shrinking or showing any cracks. We should think this Sayn cement would be peculiarly adapted for repairing defective fire-places, cracks in retorts, &c., as mortar for fireproof buildings, and for the interior plastering of furnaces. The mode of its preparation is as follows:—The cement is to be well mixed in a dry state, a small quantity of water is added, and mixed well together. As a mortar it can be used in the ordinary way. In lining furnaces, however, care must be taken to press the cement well into the walls, so as to leave a smooth even surface, as the cement when dried by the air easily crumbles, and will not harden till effected by fire; moreover, it must not be treated roughly until it has been well burnt. The sole agent for this cement in England is Mr. Henry H. B. Sang.

## CLEANING TILES.

In reply to M. Brown, a correspondent says,—"Mr. Ellencombe's hint of plain water and a flannel, very little water to be used, and the tiles wiped quite dry, will keep hall tiles, mostly yellowed ones, looking fairly well; but as before adopting his suggestion (which came, by-the-by, in answer to a question in your "valuable journal," as everybody calls it), a brush had been used to mine, they do not look so well as they would otherwise.

Another correspondent writes:—"We find the best way to clean tiles is to wash them well with clean water only, and occasionally to scour them with pumice-stone powder. Avoid soap, milk, or any greasy or oily substance.

R. P.

**The Metropolis Management and Building Acts Amendment Bill**, promoted by the Metropolitan Board of Works, received the royal assent on Monday last, and is now, consequently, an Act of Parliament.



## OBTAINING TENDERS FROM BUILDERS.

Sir,—I think your readers generally will agree with the note which you appended to the letter of your correspondent, "One who has been Duped," on the above-named subject. The answer occurs, however, that in actual business it is impossible to have all terms and conditions clearly laid down in every individual case as it arises, and for this reason it becomes necessary to rely upon general principles and established usage on some occasions. That these occasions are allowed to occur much too often may be readily admitted, but sometimes they cannot be avoided, and at other times the circumstances are so common that it is assumed that "it will be all right" without expressing the terms of the transaction beforehand.

It is necessary, therefore, to ascertain what general principles apply and what established usages prevail in each case. If these usages admit of the treatment which your correspondent has received, they ought to be altered; and if the law gives him no redress, it is a poor, weak institution. The gist of his grievance, I take it, is that he was *duped* to tender. Had the work been publicly advertised, and your correspondent responded in the usual way, if his tender was lowest, and assuming that his character as a tradesman was good, and his sureties substantial, he would have a fair claim to the work, personal predilections of the proprietor or his architect to the contrary notwithstanding; but, being specially and personally invited to tender, and being put to the great expense and labour of taking out quantities for and pricing a job worth 4,000*l.*, it is difficult to see upon what principle or for what reason he could be thrown aside. If an architect could establish as good a claim to be appointed victor in a competition, he would think it a grievous case to lose it.

But it seems to me,—and this is the point on which I wish to hear your opinion and that of your readers,—that the clause as to the non-acceptance of "the lowest or any tender" does not apply, because the stipulation in question is made with two objects, one of which applies in this case and the other does not. The first of these objects is to enable the proprietor to withdraw from the work if the cost exceed his means or his wishes. All contractors voluntarily take the risk of this result when they send in tenders, and the power to withdraw from the work without incurring charges for estimates is, in itself, a useful privilege. But the proprietor did not withdraw from the work, and his reason for rejecting the lowest tender,—a rejection which places the rejected tender on an unfavourable imputation,—might be sought in the ability of the cautionary clause to warrant him in shunting a "shady" or a "shaky" contractor. In effect, however, the proprietor and his advisers have, by asking for the tenders, admitted the fitness of the firm to do the work. When the tenders are in, it is too late to go back from that position. If not fit, or if in any way unsuitable or disagreeable (and many contractors merit some of these descriptions), it was absurd to ask them to tender, and unjust to put them to needless expense. My judgment, therefore, is for the plaintiff, with costs.

A COUNTRY ARCHITECT.

## BUILDING CONTRACTS AND BILLS OF QUANTITIES.

HUGHES v. OWEN.

AN award has recently been made in the case of Hughes v. Owen in favour of the plaintiff, for 893*l.* 0*s.* 4*d.*, in addition to the sums of 500*l.* and 566*l.* paid into Court during the progress of the action, which was one brought to recover a sum of 2,895*l.*, being the balance of accounts rendered for contract and extra works in connexion with alterations in and additions to a house belonging to the defendant. The case is one of considerable interest to contractors and others, especially with regard to the accuracy of bills of quantities prepared by the architect himself, in a contract under which he is appointed sole arbitrator in a case of dispute, as well as the value of all extra works executed. The facts of the case are shortly as follow:—

In the month of June, 1877, the plaintiff submitted to the defendant a tender for certain work at 9,435*l.*, according to quantities furnished by the architect. The proprietor had been not cost more than 4,600*l.*, declined to proceed, and consequently the process known as "cutting down" was resorted to; the plans were altered, new quantities prepared and priced from a schedule of prices in the original contract, and eventually, in August,

1877, a contract for 4,953*l.* was entered into between the parties. By this contract the work was required to be completed on or before the 31st of January, 1878; payments, if not less than 500*l.* each, at the rate of 80 per cent. on the value of the work done, were to be made as the work proceeded, until the 20 per cent. retention money amounted to 500*l.*, after which payment was to be made in full, and the balance to be paid within a month after the architect's certificate of completion. The quantities were guaranteed by the contract, but power was given to the architect to deviate from the drawings. Any additions or deductions were to be valued by him, and his decision upon the value of such additions and deductions, and also upon any questions arising under the contract, was to be final. The contract work and extra works (for which extra works alone the contractor claimed about 3,000*l.*) were completed in August, 1878. At that time 4,500*l.* had been paid on account of the original contract, and certain minor special contracts for extra works. A notable feature of the case lay in the fact that, while extra works had been completed to the extent of over 2,500*l.*, the architect objected (on principle, as he said,) to make any payments on account of extra works until after his final certificate of completion, and yet he claimed to price such extra works at a rate of 80 per cent. The result of this was that the retention money which by the contract was limited to 500*l.*, in fact amounted to more than 3,000*l.*, the contractor having no security for the payment of this sum, and being compelled to suffer the inconvenience and loss caused by the almost indefinite postponement of the payment of the balance, which should have been paid within a month after completion. On the 6th of December, 1878, the architect submitted a draft account to the contractor, asking for his remarks thereon; this amount showed a sum of 306*l.* due to the contractor for extra work, less half measurement charges. The contractor disapproved of it from beginning to end, and requested an interview with the architect, who, in reply, asked the contractor to put in writing his objections to the account. A long list of objections was sent, alleging the inaccuracy of nearly every item. The architect then submitted an amended account, some items being more, others less, than in the former one; some struck out and new ones added, but nearly every line being altered. The contractor still demurred, and the architect again amended the account for extra works under strong pressure both from the contractor and from the proprietor, and it then showed a sum of 1,613*l.* due to the plaintiff. The referee appointed in the action has now fixed the amount at 2,617*l.*, or nearly three times the amount originally assessed by the architect for extra works over and above the contract sum. This extraordinary difference has arisen solely from the original quantities for the work contracted for being deficient and inaccurate.

## BUILDING AT TOTTENHAM.

WRIGHT v. CHILDS.

THIS was an action for libel, heard before Mr. Justice Stephen and a common jury.

The parties are both builders, the plaintiff being the proprietor of some sixty houses on the "Marie House Estate" at Tottenham, and the defendant being chairman of the Tottenham Local Board, and owner of a great number of larger tenements in the same neighbourhood. At a meeting of the Board, held on the 8th of November, 1881, the defendant, referring to the "Marie House Estate," was reported to have said, "There were practically no roads at all, and no drains or sewers, and yet houses are occupied there." A question was then put by a member of the Board, "Do I understand you rightly that there are houses occupied, although there is no sewer provided?" The defendant replied, "Yes, that is so; and I hope the Board will insist on that estate being at once made up with kerbing and footpaths the same as other estates. Then, as to the sewers and surface drains, if there are any, they stand full of sewage; the fall is the wrong way, and sewage regurgitates up into the roads and gardens. I have the law on my side, and if the drains were opened they would be found full." These proceedings of the Board having been reported with considerable prominence by the local newspaper, the plaintiff claimed 5,000*l.* for compensation for the damage which he had suffered. The defendant, by his pleadings, denied having uttered the libellous expressions charged, and also pleaded justification and privilege.

The expressions were proved by the shorthand writer who reported the proceedings at the meeting, and the plaintiff himself was the next witness. He stated that when he bought the land in question for the purpose of building upon it, the roads, sewers, and drains had already been laid in accordance with plans which had been approved by the Local Board and under the inspection of its officers. Complaint had been made in respect of two of the plaintiff's houses, in the case of which an examination revealed that the sink pipe had been connected with the surface drain, instead of with the sewers; but had been set right. There had been previous alterations and some litigation between the plaintiff and the defendant, and the defendant had threatened more than once to "put the Local Board on" the

plaintiff. The plaintiff further charged the defendant after the commencement of the action with having procured persons to stop both the surface drains and sewage pipes. He said that these pipes had in more than one place been deliberately broken upon his property, and plugs of clay and matting inserted, so as to choke the pipes, with a view to making evidence for the trial of this action, the places where these plugs had been inserted having been covered again with earth, so as to conceal what had been done. He further added that he himself had seen the defendant jumping on the pipes and picking out the clay from the joints. The Surveyor to the Local Board, and other persons, members of it, were called as witnesses on behalf of the plaintiff to speak to the condition of the drains and sewers upon the property in question, and one witness stated that eight or nine cartloads of sewage had been removed from the surface drains in St. Paul's-road on the defendant's property. It was denied, however, by the plaintiff's witnesses that this sewage had found its way from the plaintiff's houses.

The defendant, being called, stated that in 1875 he had bought part of a property known as the Coleraine Estate, and expended about 100,000*l.* in building upon it. The Marie House Estate, which adjoined, was purchased by a Mr. Hine in 1873 and laid out for building. The plaintiff was only one of more than thirty proprietors upon that estate, the condition of which caused much injury to his own. The defendant contradicted the evidence of the plaintiff as to his having procured the secret stoppage of sewers or drains upon the plaintiff's property. In answer to a question on behalf of the defendant to describe the condition of the Marie House Estate in respect of sewage and drainage, and deposed to the faulty arrangement of the pipes, which in one place were laid in a form known to surveyors as a "hog's back," which necessarily produces at least a partial stoppage owing to the lodgment of sewage or drainage matter.

The jury, before the case concluded, intimated that they were agreed to find a verdict for the defendant.

Judgment was given accordingly.

## STAINED GLASS.

Hayton.—The west window of St. Mary's Church, Hayton, near Maryport, has just been filled with a memorial window, erected by Mr. Joseph Hetherington, of Midtown. The window contains four lights; the two centre openings, divided by a narrow mullion, being filled with one subject running through the two, that of "Christ blessing little children." In the one compartment, the Saviour is resting his hand lightly upon the head of a little child, whilst around him are grouped little ones with flowers, wreaths, &c. In the other compartment are shown mothers bringing their children, whilst in the background are the disciples, who have ceased rebuking them. The bases of these lights contain the subject (crowned by dwarf canopies) of Mary washing the feet of Jesus in the house of Simon the Pharisee. The lights are surmounted by canopy work turreted and foliated. The side lights respectively are filled with single figures of "Our Lord as the Good Shepherd" carrying a lamb in his arms, and "Our Lord as the Light of the World," representing Him knocking at a disused and choked-up door, typical of the human heart choked up with long-neglected devotion and want of faith. Angels at the bases bear scrolls with the single word "Alleluia." At the foot of the window is a dedicatory inscription to the memory of the wife and children of Mr. Hetherington. The window is from the studio of Messrs. Gibbs & Howard, of Charlotte-street, Fitzroy-square.

Haworth (Yorkshire).—The first of the aisle windows of the new Parish Church has just been filled with stained glass at the cost of Mrs. Eliza Anderson, of Bradford, as a memorial of her deceased parents, Mr. Wm. and Mrs. Mary Ann Townsend, of Cullingworth. The window is of three lights, and of fifteenth-century character. The subjects illustrated are the Annunciation; the angelic declaration to the shepherds of the birth of the infant Saviour; and the wise men from the East following the guiding star to Bethlehem. In the tracery lights are a choir of angels, some with harps, &c. The groups are relieved in the main from a white or grisaille ground; the grounds of the tracery lights and of some adjacent parts being ruby (disappearing) and blue, the effect of each light being further enhanced by rich ornamental borders. The window is from the studio of Messrs. Powell Bros., Leeds.

Ledbury.—In the Webb Memorial Window, recently completed for Ledbury Church, the First and Second Advent of Our Lord are shown together. The first coming is heralded by the preaching of St. John the Baptist, "Prepare ye



the way of the Lord." This is the first subject at the bottom of the window on the left hand. The second subject is the Archangel Gabriel announcing to the Blessed Virgin Mary that she is to be the mother of the Saviour, and that He should be born of her. The third subject shows Our Lord's Birth or first coming. Above is illustrated the second coming. In the top of the window Our Lord is shown coming surrounded by seraphim; below are shown His Mother who bore him, as Mercy; behind her is the Lily. On the other side is St. John the Baptist, as Justice, with the sword,—she the preacher of Purity, he of Repentance. In the centre is Our Lord's Cross (the sign of the Son of Man) borne by angels, whilst beneath is St. Michael with the balance, and the angels with the last trumpets. Standing on the earth, which this heavenly host is about to visit, are Enoch and Elias witnessing to the world the truth of Holy Prophecy. The window is from the studio of Messrs. Lavers, Westlake, & Co., Radcliff-street.

### THE BLACKSMITH'S ART.

MESSRS. GARDNER have undertaken the onerous task of forming a collection illustrative of the blacksmith's art in the past, and a meeting in connexion with their exhibition will be held by the Architectural Association on Saturday, July 1st, when a paper by Mr. G. H. Birch, secretary of the London and Middlesex Archaeological Society, will be read.

When we reflect that nearly all existing specimens of the blacksmith's art, as distinguished from the locksmith's and armourers', are permanently fixed to wood, brick, or stone, and are therefore not available for exhibition, we easily realise that the difficulties in getting together anything like a representative collection must be considerable. Nevertheless, good examples of Flemish, German, and Italian, as well as English wrought iron, will be found, many of them being unique in their methods of treatment. Prominent among the objects brought together are several muniment-chests, one contributed by Messrs. Marks & Durlacher being especially fine. Other specimens worthy of remark are window-grilles, steel-yards, brackets, some valuable door-knockers and hinges. It is well known that for a long while Mr. Ruskin has been earnestly advocating the more general use of wrought iron for domestic purposes, and we hail with satisfaction every effort towards a realisation of his aspirations in this direction. The exhibition will be held at 453, Strand, and remain open from June 27th to July 7th inclusive, and admission will be given to architects and professional men on production of their cards. Application for admission by the public must be made to Mr. E. or Mr. J. Gardner, at 112, St. Martin's-lane.

### "WASHABLE WALLS."

SIR,—I saw some remarks on this question in your journal some months ago, and I carried out the instructions, as I wanted some washable paint for the walls of a cottage hospital.

The result has proved satisfactory, and I can recommend the "Asbury" process to your correspondent.

M. D.

SIR,—In your last issue I find "W. H. S. S." is anxious to know of an "inexpensive washable decoration (not paper) for walls of institutions such as hospitals."

I would most certainly advise "W. H. S. S." to try "Lincrusta-Walton, the Sunbury wall decoration, which is not only washable, but is almost indestructible, besides which it is a most perfect decoration.

It does not come quite as cheap as "W. H. S. S." requires, but its durability, and the easy way in which it can be cleaned, makes it in the end cheaper than the commonest of wall papers.

GEORGE MARSON.

**New Waterworks, Henley-on-Thames.**—On Saturday last a party of noblemen and gentlemen, comprising many well-known engineers and scientific authorities, assembled at Henley-on-Thames, on the occasion of the opening, by the Right Hon. W. H. Smith, M.P., of the new waterworks recently completed for the supply of the town. The works, which have been designed by Mr. Jabez Church, C.E., are fitted with the Atkins patent system of softening and purifying water in large quantities, and are the first example of the application of the invention on a scale large enough for public water supply.

### EXPLOSION WITH ELECTRIC LIGHTS.

In Pesth, as in all the chief cities of Europe, experiments are being carried on just now with various systems of electric lighting. At the National Theatre in the Hungarian capital, where the Swan system was being tried, an alarming break-down occurred on the second night of the experiment. The opera of "The Marriage of Figaro" was announced, and a numerous audience had assembled. In the course of the first act the electric lamps suddenly exploded, and the entire apparatus broke down. The conducting wires became white hot, while the lights were completely extinguished. The performance, of course, was stopped, and the audience was for the moment seized with panic and left their seats. Fortunately there was no serious accident, and half an hour afterwards the performance was resumed with the help of ordinary gas lights. The cause of the breakdown has not yet been explained.

### PAYING APPORTIONMENTS.

ALFRED C. DICKINSON.

This case came up in the Court of Appeal (from a decision of the Queen's Bench Division) on Tuesday, before the Master of the Rolls, and Lords Justice Lindley and Bowen.

The case, which was one of considerable importance to owners and occupiers of house property within the metropolis, was whether the plaintiffs, as the representatives of the owner of certain house property at Highbury New Park, were entitled to recover from the defendant (who was the lessee of one of these houses for a term of seven, fourteen, or twenty-one years at a rack rent) the proportionate share of the expenses of paving the street, for which sum (as apportioned to the particular house) a demand had been made by the vestry of St. Mary, Islington, upon the plaintiffs, as owners, and by them paid in pursuance of notice from the vestry clerk of the parish. The lease to the defendant (the tenant) contained a covenant that he would pay the yearly rent, "and also will pay the sewer and main drainage rates, tithe-rent charges, Board of Health, metropolitan, and other district rates and assessments whatsoever, whether Parliamentary, parochial, or otherwise, which now are or which at any time during the said term shall be taxed, rated, charged, assessed, or imposed upon the said demised premises or any part thereof, or upon or payable by the occupier or tenant in respect thereof (except the property or income tax)."

Upon the hearing of the special case in the Queen's Bench Division, in February last, judgment was given for the defendant by Mr. Justice Mathew and Mr. Justice Cave, upon the ground that the amount sued for was not a "sewer or main drainage rate," &c., or "assessment Parliamentary, &c., charged either upon the premises or upon the tenant or occupier in respect thereof," within the terms of the lessee's covenant; their Lordships observing that the chief question was one which was made once for all, and was clearly for works for the permanent improvement of the property, and, therefore, for the interest of the landlord as distinguished from a rate made for temporary or current expenditure for the interest of the tenant or occupier.

From this decision the plaintiffs, the representatives of the landlord, now appealed. The argument turned upon the construction of the provisions of the Metropolitan Local Management Act, 1855 (18 & 19 Vict., c. 120), and the Amendment Act, 1862 (25 & 26 Vict., c. 102), relating to the paving of new streets and the power of Vestries or District Boards to require payment of the costs or expenses from the owner or occupier.

Their Lordships affirmed the decision of the Court below, and dismissed the appeal.

### Miscellaneous.

**Royal School of Art-Needlework.**—The annual sale of embroideries, &c., from the Royal School of Art-Needlework at South Kensington, of which Her Royal Highness the Princess Christian is President, was opened on Tuesday, by permission of the Duke of Westminster, at Grosvenor House. The school was founded with the twofold object of providing suitable employment for gentlewomen and of restoring ornamental needlework to the high place it once held among decorative arts. How far it has succeeded in effecting the first object may be judged from the fact that the three workrooms, the designing-room, and other parts of the school in the Exhibition-road are daily filled with students, who find employment there; while the many admirable specimens of art-needlework at Grosvenor House show to what good purpose the art of design, the employment of colour, and the use of the needle have been taught.

### Safety in Metropolitan Theatres.

At the meeting of the Metropolitan Board of Works on the 16th inst., it was resolved, on the recommendation of the Fire Brigade Committee, that the chief officer's report on the theatres in the metropolis which are now under inspection, and which he has not yet reported upon, be printed as soon as it is ready. The Building Act Committee reported, with reference to the notice of appeal of Mr. A. W. Arnold, the owner of the Lyceum Theatre, against the requisitions of the Board as to the structural alterations of the theatre, that the committee, in exercise of the authority conferred on them by the resolution of the Board of the 26th of May, have instructed the solicitor to retain such counsel as he thinks necessary to represent the Board at the arbitration, and also to retain Mr. John Whichcord and Mr. Henry Currey to give evidence in support of the requirements of the Board; also recommending that Mr. W. Hudson, in reply to his letter submitting certain observations by the owner of the Lyceum Theatre upon the requirements of the Board, and an alternative plan for the reconstruction of the gallery stairs, be informed that the Board are unable to recede from, or vary, any of the requirements contained in their notice. This was agreed to, notwithstanding a protest from Mr. Reddish that as there had been no accident of any kind in this theatre, the action of the Board was somewhat arbitrary, and would tell very heavily on the owner. He thought a comparison should be made between the theatres and some of the large hotels and shops, where hundreds of persons lived.

### Proposed Improvements in the Strand.

On the 16th inst. a meeting was held at Carrington Hotel, Strand, under the auspices of the Strand Improvement Association, for the purpose of agreeing to a memorial to be presented to the First Commissioner of Works in reference to improving the access to the New Law Courts, the removal of the south side of Holwell-street, and the widening of the Strand. The Rev. J. Lindsay, rector of St. Clement Danes, presided. A memorial, which it was proposed to present to the Right Hon. G. J. Shaw-Lefevre, was read, which called his attention to the growing necessity of improving the access to the New Law Courts from the west and north-west. The memorialists asked, in view of the opening of the Law Courts, that the First Commissioner of Works would take the whole question into his consideration. The rev. chairman remarked that upon moral grounds the accomplishment of the suggested improvements was very desirable. Mr. F. H. Fowler, of the Metropolitan Board of Works, moved the adoption of the memorial, and that the members for Westminster be requested to introduce a deputation from the Strand Improvement Association to the First Commissioner of Works in order that they may personally present the petition to the right hon. gentleman. Mr. Innes seconded the motion.

**Toxteth Park.**—Colonel Wilson presided at the last monthly meeting of the Local Board for the district of Toxteth Park. The death-rate for the month was 15.3 per 1,000 per annum, and the medical officer (Dr. McLelland) reported that no deaths had occurred during the month from zymotic disease, and the district continued in an extremely satisfactory condition. Mr. Hall, the surveyor to the Board, in his annual report, said plans of 239 dwellings, comprising mansions, villas, shops, and cottages, were submitted during the year, as compared with 213 the previous year, and that year was very much in excess of any previous year. There were erected thirteen villas, varying from 150l. to 300l. annual value, or an average of 225; sixteen at an average of 100l. per annum; thirty-five varying from 30l. to 50l.; and 145 from 15l. to 30l. The net annual value now amounts to 103,619l., as compared with 97,737l. last year, or an increase of 5,882l., being the largest increase for one year that has ever occurred in this district. There are at the present time about 278 houses of all classes unoccupied, and 110 in course of erection.

**City of London College.**—The City Press states that the Directors of the Bank of England have voted a contribution of 500l. towards the fund for the new buildings of the City of London College.

**Delayed in the Press.**—In consequence of the New Amendment Act having become law, the publication of Mr. Banister Fletcher's new text-book, "The Metropolitan Building Acts," is temporarily delayed.



**Stafford House.**—Stafford House was on Friday night, 16th inst., lighted by electricity, the incandescent system being used throughout. The experiments were carried out by the British Electric Light Company, and the Duke of Sutherland invited a large number of gentlemen to witness them. The lighting commenced at ten o'clock, and was continued till after midnight. The total number of lamps in use was 258, each of 20-candle power. The picture gallery, which is 123 ft. in length, was lighted by 176 lamps, and in the banquetting-room, which is 62 ft. long, there were seventy-three lamps. The machinery by which the lights were sustained was erected temporarily in the garden, and driven by a steam-engine of twenty horse-power. The whole of the work was prepared in five weeks. There were six Gramme dynamo-machines, with two feeders. The engineer of the company explained that the engines were not worked up to their full power, and that in the event of two of them breaking down, by working the remaining four up to their power no inconvenience would be caused. The machinery worked with perfect facility. It was shown that there was no danger by coming into contact with the wires, and that the lamps could be separately or collectively extinguished or removed at will.

**The Wynrwy Waterworks: the Contracts for Iron Pipes.**—At a meeting of the Liverpool City Council on Wednesday last, Mr. Bower moved the following recommendation of the Water Committee:—"That the tender of Messrs. Cochrane & Co., to supply iron pipes (contract No. 14) for the new works between Old Marton and Malpas, at the prices specified in the schedule to their tender, be accepted, subject to the execution of a contract satisfactory to the Corporation." Mr. Bower said it was very satisfactory that this was the lowest tender, because Messrs. Cochrane were supplying them with particularly good pipes. The Deputy-Mayor.—What is the amount involved? The Town Clerk.—It is about 100,000l. Mr. Bower.—The amount involved is a large sum; it is 20,000 tons of pipes at 4l. 7s. a ton. Alderman Rigby seconded the motion. Mr. Hughes moved an amendment that the matter be referred back to the committee, on the ground of alleged favouritism towards Messrs. Cochrane, but after a great deal of discussion, the amendment was withdrawn and the tender was accepted.

**Ornamental Burial Grounds.**—This week an application was made to Dr. Tristram, Q.C., Chancellor of London, sitting at St. Paul's Cathedral, for a faculty or licence to convert the old dissolved burial-ground of St. John the Evangelist, Westminster, into an ornamental garden for the recreation of the inhabitants, numbering some 30,000, of whom 5,000 were school-children. Mr. Brunsell appeared for the Ven. Dr. Jennings and others, in support of the application, and informed the court that a site for a mortuary had been selected at the Stoneyard, Horseferry-road, and the burial-ground was to be converted into a flower-garden. Mr. Wright, the secretary of the Garden Committee, attended the court, and the matter was discussed. The original application was made some time back, and the Duke of Westminster was one of the parties. Mr. Brunsell now mentioned that the Duke of Westminster had contributed 500l., and the petitioners would bear the rest of the expenses. The Chancellor said he had no hesitation in granting a faculty.

**Wasted Gas from Blast Furnaces.**—According to the *Darlington and Stockton Times*, Mr. J. E. Stead, F.C.S., the borough analyst of Middlesbrough, has devised an apparatus for testing blast-furnace gases, which he exhibited and explained at the last meeting of the session of the Cleveland Institution of Engineers. He stated that the heating value of gas weighing nearly 7 tons, which passed off from a Cleveland furnace during the production of 1 ton of pig iron, was equal to that furnished by burning 1½ cwt. of coal, and various tests he had made had shown him that one-third of the blast-furnace gases passed unconsumed into the air, which was equivalent to throwing away about 70 tons of coal per week for every furnace making 400 tons of iron.

**Proposed International Exhibition at Rome.**—A Reuter's telegram from Rome, dated June 20, says that a Bill, supported by Signor Seismit-Doda and fifty deputies, for the International Exhibition in Rome in 1887, has been brought forward in the Chamber of Deputies.

**Ancient Tablets from Zigral, near Babylon.**—The trustees of the British Museum have just acquired, by purchase, about 300 tablets and inscriptions from Babylonia, and chiefly from Tel-Loh, the most part of unbaked clay, and are principally of that order the frequent occurrence of which has led them to be not unfairly described as "usual," being employed for the setting forth of contracts, for the acquisition and alienation of lands and other commodities, astronomical and mathematical calculations, omens, and other matters referring to the life, the worship, or the science of the country. Consequently, not much new light on any question of doubt or importance is to be derived from the collection in general. But (says the *Times*) there are a few exceptions of a vivid and particular interest. A limestone cylinder, for instance, in a beautiful state of preservation and exactness of literal definition, about 6½ in. long and the same in circumference, contains an Akkadian inscription of Arod-Ea, son of Kudur-Mabuk, King of Babylonia about 1300 B.C., showing that it is a dedication to the goddess Ishtar, as a thank-offering for the preservation of his life, along with that of his father, from some common danger, whether of battle or other violence, of accident or disease. There are also four cones, about 7 in. in height and 7 in. in circumference at the base, which challenge a special attention. One of these, which may be taken to exemplify the rest, carries a dedication to the god Ningrau or Ninip, a deity of somewhat convertible or incompletely ascertained attributes, figuring sometimes as the god of war, and relegating Nergal to the divine patronage of the chase, and at other times as the god of hunting, leaving Nergal to pose as the Mars of the Babylonian mythology. The prize of the collection, however, is an unbaked clay tablet, a copy of the original document from which the celebrated *Synchronous History of Assyria and Babylonia* was made, and dating from about the time of Cyrus, 538 B.C. This tablet contains the *History of Babylon* in a fragmentary condition, from about the fourteenth to the ninth century before Christ.

**The Baddesley Colliery Accident.**—We have pleasure in recording the following instance of liberality. It will be remembered that on the 2nd of May last an explosion took place at the Baddesley Colliery, in Warwickshire, by which several miners were entombed. A party of volunteers was organised to endeavour to rescue them, headed by the agent of the colliery, Mr. J. Pogmore. Unfortunately, a second explosion followed, by which Mr. Pogmore and several other gentlemen were so severely burned that they died from the injuries received. Mr. Pogmore held a policy against accidents with the Railway Passengers' Assurance Company, but, not thinking that he ran any risk underground, he had preferred to pay only the ordinary rate of premium, on condition that that special risk should be excluded, and under this condition his family had therefore no legal claim. But as he met his death in an heroic attempt to save the lives of others, and the company have always recognised that under such circumstances their clients are entitled to special consideration, the directors agreed to hold the policy good for the amount which the premium actually paid would have secured had it covered the professional risk, and they presented the widow with the sum of 500l.

**Street Improvement, Newcastle-on-Tyne.**—At a recent meeting of the Newcastle Town Council, the Town Improvement Committee recommended that an alteration be made in the new street to the Quayside. By the original plans, they said, traffic on reaching the Jubilee School would have to descend by an incline of 1 in 11½ to the level of the Milk-market, thus losing 20 ft. of level, and to ascend again by an incline of 1 in 21 to the level of the New-road at the Sally-port. The committee had prepared plans showing a high-level road, leaving the New-road at the east end of the Keelman's Hospital, and which would skirt the new street at a higher level, passing the site of present buildings, taking up Causey-bank at its present level, and rejoining the new street near road between the two points, and entirely avoiding the descent into the Milk-market. The net cost of the improvement would be about 2,300l., exclusive of the value of Vint's-buildings. The report was adopted.

**Wisebech Exhibition.**—Messrs. Leach & Sons' exhibition of paintings on china, terra cotta, &c., which has been held at the Working Men's Institute, has proved a great success. The judges have made their awards of medals and other prizes, and have published their report. They draw special attention in it to the exhibits sent on loan by the Torquay Terra Cotta Company, Limited, of Helo Cross, Torquay, as well worthy of the attention of amateurs who are striving to excel in pottery decoration. This company devotes both capital and art knowledge to make the ware stand unrivalled for decorative purposes, for the use of amateurs. Another special feature of the exhibition mentioned as giving a lesson to this district, is the collection of pottery from the village of Linthorpe, near Middlesbrough. The unrivalled natural beauty of its brilliant glaze will commend the ware to all lovers of art pottery, and only need to be widely known to be thoroughly appreciated. Bricks, tiles, and all building articles are being made from this clay. The judges say, "If we in this district could take advantage of the idea and utilise the clays round Wisebech, which are so superior in texture and adaptability to the Linthorpe clays, what a field of prosperity it would open,—the old town would again have a staple article of commerce, and any success would in a great measure be indebted to your zeal in promoting art exhibitions."

**Vibration from Railway Trains.**—A London correspondent, *drops* of the Duke of Westminster's complaint under this head, writes:—"The question of vibration from railway trains may become very interesting from a lawyer's point of view. The purchaser of an undetermined house, with a railway running under it, is certainly a purchaser with notice of a terrible nuisance. But if the resources of civilisation are to bring in an entirely new and hitherto unsuspected trouble and danger, is there to be no compensation for their injury? The main difficulty lies in this, that those who suffer from the application of the continuous brake suffer not intermittently, but perpetually. Theirs are the houses which have the bad fortune (or, as their owners thought some years ago, the good fortune) to be very near the stations. The result is that every train,—not merely an occasional one,—enters that special tunnel clogged by the brake. It is not that the occupier suffers now and then; he suffers in some cases every three minutes, from six in the morning till midnight. The walls are cracked; the ceilings tumble down, and he lives, not metaphorically but actually, in conditions of perpetual earthquake. But suppose an Act of Parliament orders the use of that special brake, the railway companies have no option but to obey. Has the poor householder any power to obtain compensation? Apparently none." We some two or three years ago called attention to the subject.

**The English Timber Trade.**—The trade in home-grown timber cannot be said to be in a prosperous condition at the present time. From no part of the country can we hear of a brisk demand. In the districts round Berkshire and Buckinghamshire oak is very low in price; in the eastern counties the market is said to be overstocked, whilst in Yorkshire it is reported to be quite a drag. At the Lancashire bobbin mills trade is dull and has been for months past, and the raw material is fetching low prices. The great and prolonged stagnation in the general trade of the country of a few years back, and especially the depression in the coal and iron industries, brought prices down to the very lowest ebb. The hopes cherished that the revival of trade which set in last year would stimulate the demand and lead to improvement in values have been dissipated by the fearful havoc wrought in our woodlands and forests by the late October and April gales, which have thrust an enormous quantity of wood on an already overstocked market.—*Timber Trades Journal.*

**Royal Cambrian Academy of Arts.**—Efforts are being made to obtain a permanent home for this institution, and subscriptions have been received from Lord Windsor, Lord Penrhyn, and other noblemen connected with the Principality towards the building fund. The inaugural exhibition will be formally opened this month at Llandudno.

**Brompton Hospital for Consumption.**—Referring to our notice of the new buildings, we may add that Mr. Julius Sax was the contractor for the telephones, electric bells, and speaking tubes.



**Artisans and Labourers' Dwellings.**

The Select Committee of the House of Commons on this subject met on Monday afternoon and agreed upon their report, which contains various recommendations as to how the expense, delay, and difficulty of carrying out the Acts upon the subject may be reduced. The committee have been occupied for two sessions in considering Mr. McCullagh Torrens's Act of 1868, amended in 1879, and Sir Richard Cross's Act of 1875, also amended in 1879, as well as the Sanitary Acts and those enabling the Metropolitan Board of Works to carry out street improvements. As the result of their deliberations the committee now make a variety of suggestions with a view to abate the enormous expense which has hitherto been the chief difficulty in erecting cheap dwellings for artisans upon the remainder of cleared areas on valuable urban sites. In addition to the proposals for facilitating the operation of the Acts by removing technical difficulties and modifying the requirements of past legislation, the committee find that when Sir R. Cross's Act came into force the Vestries expected, although erroneously, that what they were doing under the Act of Mr. Torrens would be done for them by the Metropolitan Board of Works. This to a large extent stopped their work, and it became necessary to define clearly the proper sphere of the two systems. So far from dealing with them as antagonistic, the committee strongly express the opinion that both should be worked *pari passu*, each being suited to different conditions, and both being more than needed to afford any effectual relief. The committee also recommend that the obligation placed upon the Eastern Counties system of railways out of London to provide trains for artisans at the rate of 1d. for each passenger per course of seven or eight miles should be extended to other suburban railways as opportunities may offer.—*Times*.

**Strikes and Strikers in the United States.**—We learn from America that twenty thousand iron strikers, with members of other trades, walked in procession at Pittsburgh last Saturday afternoon. Six thousand iron workers from the outside of Pittsburgh, 5,000 colliers, and 8,000 Pittsburgh ironworkers formed the chief divisions of the procession. All these men, we are told, showed a stubborn determination to maintain the strike. The Cleveland Rolling Mills report that the full complement of non-strikers—1,200 men,—are now working at the old wages. All fears of disturbances are over. This ends the strike there. Many of the Cleveland strikers have gone elsewhere seeking work. The freight handlers' strike at New York has extended to 200 at the Erie Docks and 75 at the Pennsylvania Docks. Others were solicited to join, but they continued to work at the old wages, awaiting an answer to the request sent to the head officer of each railway for more pay. The strikers made a parade along West-street, New York, endeavouring to get the men at the docks to join them. The police, however, soon dispersed them; but much dissatisfaction has been caused among the railway dock labourers. The Hudson River Railway labourers' strike continues, almost stopping work at some of the New York City freight stations. On Saturday night the strikers held a crowded meeting, principally consisting of Irishmen, demanding 20 cents per hour. They are particularly opposed to the Italians, saying that it takes three Italians to do one Irishman's work. Several minor strikes prevail at New York, and an unsettled condition of the labour market exists in almost every trade.

**Surveyorship to the City Commission of Licensancy.**—On Monday, at a meeting of the Commission, held at the Mansion House, at which the Lord Mayor presided, Mr. Alexander Peables, C.C., was elected to the office of architect and surveyor by a large majority. The other candidates were Mr. Arthur Hudson and Mr. H. H. Collins.

**The Crusaders' Lodge of Freemasons** purpose presenting two large painted windows to the Church of St. James, Clerkenwell, which is about to be restored under the superintendence of Mr. A. W. Blomfield. The windows will contain subjects from the Old Testament emblematical of Freemasonry. Mr. Charles Evans, of Warwick-street, Regent-street, is the artist commissioned to execute the work.

**The Proposed New Public Offices.**—The Public Office Committee held a meeting on the 16th inst., when they unanimously approved of the preamble of Mr. Shaw-Lefevre's Bill.

**Proposed Riverside Fish Market, Shadwell.**

On Tuesday the Committee of the House of Lords (the Duke of Leinster, chairman) passed the private Bill promoted by Messrs. Hewett to establish a new riverside fish market at Shadwell. The Committee, however, adopted two important clauses in the interest of the Corporation of London. One of these clauses empowers the Corporation within six months after the passing of the Bill to acquire the rights of the promoters with regard to the new market on paying them their cost of promotion. The other clause provides that, if this option be not exercised, the proprietors of the new market shall compensate the Corporation for any falling-off caused thereby in the tolls at Billingsgate.

**Lee (Kent).**—Plans for a new Bible Christian Chapel have been prepared, and tenders will shortly be sent in for the erection of the same, which is in the Gothic style. The entrances for ingress and egress will be spacious. The front will be faced with Kentish rag and Bath stone (the sides being hidden by adjoining buildings, will be brick), and have a large five-light traceried window, the left angle having a spire which terminates octagonally, and which will be executed in Bath stone. The roof will be open-timbered. The cost will be fully 3,000*l.*, and the architect is Mr. W. Theobalds, Watling-street, City.

**Lowestoft Improvement Commissioners.**

The main intercepting sewer, forming part of the new general drainage scheme for Lowestoft, has recently been completed, from plans and under the superintendence of Mr. R. H. Inch, Assoc. M. Inst. C.E., Town Surveyor. Messrs. Cook, Bennett, & Thew were the contractors, the amount of the contract being nearly 9,000*l.*

**TENDERS**

For making new road from South-street to Malva-road Wandsworth, for Major J. Childs. Mr. George Edwards, surveyor:—

Pizey	£299 0 0
Killingback	899 0 0
Green	885 0 0
Mears	705 0 0
Ford & Everett	624 0 0
Nowell & Robson (accepted)	670 0 0

For repairs to The Chestnuts, Denmark-hill, for Mr. A. Stedall. Mr. George Edwards, architect:—

Hermann & Son	£1,390 0 0
Simpson & Sons	1,270 0 0
Canning & Mullins	969 0 0
McLachlan & Sons	924 0 0
Martin, Wells, & Co.	916 0 0
Tarrant & Sons	892 0 0
Clark & Mannoch	881 0 0
Goad	84 0 0
Stimpson & Co. (accepted)	843 0 0

For workshops and offices in Westgate-street and sheds at Docks, Cardiff, for the Cardiff Corporation:—

C. Griffiths	£342 10 0
D. Davies	285 0 0
S. Shepton	273 0 0
J. Thomas	271 0 0
C. O. Dunn	265 0 0
J. Jones	250 0 0
C. O. 345	245 0 0
D. J. Davies	228 0 0

**Store-shed at Docks.**

D. J. Davies	80 0 0
T. Richardson	77 13 9
J. Jones	60 0 0
S. Shepton	39 10 0
O. Purnell	38 10 0
J. Thomas	38 0 0
G. Griffiths	36 13 6
D. Davies	34 0 0
C. O. Dunn	30 0 0

For repairs and alterations to premises at South Norwood, for Mr. R. Brad. Mr. E. Sherman, architect:—

Robert Beeton, London	£1,164 0 0
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For farm-buildings, Wellingsborough, for Mr. C. H. B. Whitworth. Mr. E. Sherman, architect:—

J. Underwood, accepted.	84 0 0
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For building two villa residences, for Mr. B. Blott, on the Poplars Estate, Wellingsborough. Mr. E. Sherman, architect. Quantities supplied:—

G. Hackley	£1,385 0 0
F. Abbott	1,340 0 0
G. Thomas	1,300 0 0
J. Underwood	1,300 0 0
R. Marriott	1,298 0 0
E. Brown	1,272 0 0
Farden and Rookaby	1,218 0 0
G. H. Green (accepted)	1,190 0 0

For artisans' dwellings, Cork, for the Cork Improved Dwellings Company. Mr. William H. Hill, Marlborough-street, Cork, architect:—

T. O'Flynn	£11,123 0 0
E. Dewar	10,990 0 0
E. & F. O'Flynn	8,236 0 0
E. Fitzgerald	8,715 0 0

For Kesham drainage works, Messrs. Gotto & Beesley, engineers:—

Ford & Everett, Westminster (accepted).	
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For constructing railway, two bridges, and wharf, at Grays, Essex. Mr. J. Embin Walker, engineer:—

Ford & Everett, Westminster (accepted).	
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For a block of three villa residences, at Dorking, for Mr. Joseph Clift, Messrs. Bagshaw & Bealish, architects:—

Edner	£2,610 0 0
Macey & Sons	2,598 0 0
Kilby	2,537 0 0
Goldard & Sons	2,486 0 0
J. & J. Greenwood	2,460 0 0
Hamblyn Bros.	2,440 0 0
Lynn & Dudley	2,405 0 0
Rosegrave	2,389 0 0
Beale	2,292 0 0

Accepted for Valley Sunday-schools, Manningham. Mr. James Ledingham, architect, Bradford:—

Kitchin & Co., Masonry.	
Lothhouse, Joinery.	
R. Hill, Plumbing.	
A. Hill, Slating.	
Throp, Plastering.	
Swift & Co., Painting.	

For new clyse and other works at the outlet of the River Brue, Highbridge, Somerset, for the Somersetshire Drainage Commissioners. Mr. Alfred Woodhouse, engineer:—

J. Neave, London	£19,685 0 0
Hill & Co., Gasport	15,150 0 0
S. Robertson, Bristol	13,400 0 0
J. J. Robson, London	12,799 0 0
J. Dursford & Son, Bristol	12,534 0 0
J. Phillips, Plymouth	12,500 0 0
R. Escott, Bridgewater	12,476 0 0

\* Accepted.

For new warehouse and stables at Croydon, for Messrs. Hammond & Hussey. Mr. R. W. Price, architect. Quantities by Mr. W. H. Barber:—

Ward	£1,752 0 0
Taylor	1,529 10 0
Maiden & Harper	1,515 0 0
Marriage	1,500 0 0
White	1,467 0 0
Legg	1,439 0 0
Pearson & Myles	1,420 0 0
Smith & Son	1,394 0 0
S. Page (accepted)	1,350 0 0

For a coffee-bar in proximity to the Midland Railway Station, Walsborough, for the Coffee House Company. Mr. W. Talbot Brown, architect:—

Farden & Rookaby	£272 0 0
Henson	250 0 0
Hudson & Stevens (accepted)	224 10 0

For alterations and additions to house and shop at Irecheater, for Mr. S. Parsons. Mr. E. Sharnan, architect:—

Towett, Wellingsborough	£390 0 0
Farden & Rookaby	350 0 0
Underwood (accepted)	344 0 0
Marriott	344 0 0
West, Irecheater	308 0 0

For alterations and additions to warehouses, Bankside, for Mr. Moss Isaacs. Mr. James Wear, Victoria-chambers, Westminster, architect:—

Hansel	£1,090 0 0
Greenwood	1,035 0 0
Nightingale	1,027 0 0
Toms	1,023 0 0
Robson	953 0 0
James Holloway (accepted)	946 0 0

For building new class-rooms and repairs to Belmont Hall, also repairs to Wandsworth-road school. Mr. T. H. Vernon, Abingdon-street, Westminster, architect:—

Sawyer	£597 0 0
Newton	541 0 0
James Holloway	459 0 0

For concrete subsiding tanks, stoneware pipe-sewers, cast-iron pipes, valves, sluices, &c., at Baling. Mr. Charles Jones, engineer. Quantities supplied:—

J. Hoare & Son	£5,749 0 0
McKenzie, Williams, & Co.	5,695 0 0
W. Crockett	5,686 0 0
Kellatt & Bentley	5,678 0 0
Mears	5,472 0 0
Nowell & Robson	5,430 0 0
H. Smith	5,300 0 0
G. Gibson	5,087 0 0
J. Strachan & Co.	4,982 0 0

For the erection of new offices, No. 5, Fen-court, Fen-church-street, for the City of London Real Property Company. Mr. R. B. Marsh, architect. Quantities by Mr. D. Cubitt Nichols:—

Smith	£3,580 0 0
W. Brass	3,572 0 0
J. & J. Greenwood	3,550 0 0
E. Conder	3,498 0 0
W. Bangs	3,475 0 0
Ashby & Horner	3,470 0 0
B. Lawrence	3,449 0 0
Mortar	3,389 0 0
Outwaite & Son	3,144 0 0

For alterations to offices, No. 21, Mincing-lane, and No. 36, Mark-lane, for the City of London Real Property Company. Mr. E. A. B. Crockett, architect:—

J. & J. Greenwood	£380 0 0
Outwaite & Son	338 0 0

For the construction of 1,313 ft. line 9-in. stoneware pipe-sewer, together with manholes, lamp-chests, &c., in Blyth-road, Bromley, Kent, for the Bromley Local Board. Hugh S. Cregeen, surveyor:—

J. Garton	£135 10 0
J. Bentley	129 9 0
Davis & Atwood	175 0 0
W. & J. Woodman	165 0 0
J. Taylor	148 7 0
E. Peil & Sons	145 0 0
T. Lansbury (accepted)	121 0 0

For the removal of sewage-tanks, for the Bromley Local Board:—

T. Lansbury (accepted)	£285 0 0
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**Nicholson Institute Buildings at Leek.**—In the list of tenders for these buildings, the address of the Midland Joint Company should have been given as Sparkbrook, not Smethwick.



For the erection of the Birmingham and Midland Eye Hospital, Birmingham. Messrs. Payne & Talbot, Birmingham, architects. Quantities supplied by Mr. W. Wykes, Birmingham.

Bradley & Co., Wolverhampton	£17,300 0 0
Sherman & Sons, Birmingham	16,737 0 0
C. F. Smith, Wolverhampton	16,700 0 0
T. Collins, Tewkesbury	16,600 0 0
H. Bennett, Rugby	16,535 0 0
H. Lovatt, Wolverhampton	16,230 0 0
Farwell & Son, Rugby	15,875 0 0
F. Moffatt, Birmingham	15,720 0 0
Jeffrey & Son, Birmingham	15,400 0 0
Sapcote & Sons, Birmingham	15,340 0 0
Barclay & Sons, Birmingham	15,180 0 0
W. & J. Webb, Birmingham	15,050 0 0
J. Garlick, Birmingham	14,549 0 0
J. Bowen, Birmingham	14,780 0 0
W. T. Bennett, Birmingham	14,727 0 0
Barker & Son, Birmingham	14,684 0 0
W. Robinson, Birmingham	14,652 0 0

\* Accepted.

For the re-division of a portion of the Dedford Park Estate, for the Dedford Park Company (Limited), Mr. Frank Goldring, surveyor. Quantities by Mr. C. E. Lyles, Engineer to the Acton Local Board.

Wheeler	£7,320 0 0
J. Strachan	6,825 0 0
Rowles	5,683 0 0
Piszev	5,525 0 0
Nowell & Robson	5,330 0 0
Bloomfield	5,180 0 0
Cudley	4,780 0 0
Finnegan	4,973 0 0
Mears	4,444 0 0

For building a pair of villa residences in Beaumont-road, Bedford Park, for Mr. A. T. Williamson, Mr. Frank Goldring, The Field's road, architect.

Priestley & Gurney	£1,260 0 0
T. Bendon	1,153 15 10
W. T. Niblett	1,111 0 0
Balaam Bros.	1,031 0 0
L. Gassick	1,010 0 0
Parker	1,010 0 0
R. & E. Evans	996 0 0
J. C. Dare	977 9 0
Fowler	875 0 0
Aldridge & Jevey	883 16 6

For repairs to court-house, St. Alban's, Herts. Mr. Urban A. Smith, surveyor. Quantities supplied.

Ireson, Northampton	£250 0 0
Miskin, St. Alban's	470 0 0

For repairs and alterations to premises, Old Kent-road, for Mr. R. Brail.

Robert Beeton, London	£364 0 0
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For Deacon's school and master's residence, Peterborough. Mr. J. R. Naylor, architect. Quantities supplied.

Jones & Co., Gloucester	£2,581 0 0
Farniss, Sibley, & Hill, Peterborough	2,522 0 0
Chattell & Martin, Peterborough	2,493 0 0
Town & Northampton	2,291 0 0
Greenfield, Boston	2,203 0 0
Gray, Peterborough	2,192 0 0
Rands & Sons, Wisbech (accepted)	2,106 0 0
Rollers Bros., Stamford	2,100 0 0
Balling, Ollerton	2,037 0 0
Chapman, Great Grimsby	1,765 0 0

For new fire-brigade station, Faraday-road, North Kensington. Mr. G. V. Gulliamy, architect. Quantities by Messrs. Nixon & Raven.

Tozer	£9,245 19 0
D. G. Laing & Son	8,789 0 0
Holt	8,540 17 0
Mowlem & Co.	8,150 0 0
Bentley	7,689 0 0
Lucas & Son	7,643 0 0
Reading	7,494 0 0
Tyerman	7,491 0 0
Garrud & Tink	7,231 0 0
Stimpson & Co.	7,212 0 0
Hock	6,857 0 0

For alterations and repairs to the Barley Mow, Dorset-street, Baker-street. Mr. F. W. Hunt, Upper Baker-street, architect. Quantities by Messrs. Vinnal & Kennedy, Guilford-street.

J. & H. Coles	£692 10 0
W. H. Butcher	673 0 0
Haylock	660 0 0
E. Harris & Sons	657 0 0
Parker	640 0 0

For the erection of a coffee public-house, Midland-road, Wellingborough, for the Coffee-house Company, Limited. Mr. W. Talbot Brown, architect.

E. Brown	£4,053 0 0
J. Underwood	3,982 0 0
G. Henson (accepted)	3,700 0 0

For new town-hall and offices, Corsham, Wilts. Messrs. Smith & Marshall, Chippenham, architects.

Bromley, Osborne, & Cole (accepted) £1,540 0 0

For alterations to a house in Senior-street, for Mr. J. T. Smith. Mr. Frank Goldring, architect.

Nightingale	£172 0 0
Guyver	138 0 0
Aldridge & Jevey	81 8 4
Conway	73 10 0

For repairs, &c., at the Prince of Wales, Elizabeth-street, for Mr. Riven. H. I. Newton, 27, Great George-street, architect.

Budock	£192 0 0
Simpson	185 0 0
Pickersgill Bros.	157 0 0
Wood (accepted)	142 0 0

For villa residence with stabling, at Westcombe Park, Greenwich, for Mr. Richard Fegan, M.D. Mr. Thomas Dinwiddie, architect.

Reidman	£2,780 0 0
Whittaker	2,670 0 0
Wood	2,568 0 0
Sly	2,554 0 0
Bowdidge & Burley (accepted)	2,400 0 0

For pulling down old premises and erecting three houses in Fenchurch-place, Cambridge-road. Mr. William C. Livermore, architect.

Russell	£668 0 0
Mansell	600 0 0
Sills	581 10 0
Poulson	579 0 0
England & Thompson (accepted)	577 0 0

For villa at Woodberry Down, Stoke Newington, for Mr. C. Gatliff. Messrs. F. Percy Harrison, Cooper, & Co., architects. Quantities by Mr. Edwin C. Plinks.

Burnan	£1,268 0 0
Stevens Bros.	1,212 0 0
Scott	1,173 0 0
Harris & Wardrop	1,126 0 0

#### TO CORRESPONDENTS.

A. T. T. drawing has not come out satisfactorily. It shall, however, appear before long. W. T. read the specification this, and what is given on there. The plan is to be supplied as follows: one half of front, two half of side, three half of rear. J. A. H. - J. T. - A. W. - W. H. - L. - W. R. H. - H. & R. - L. & Son. - J. R. - C. R. - E. - N. - T. - J. U. - W. B. - W. H. - R. - J. H. - J. R. - B. C. - J. - T. - D. - F. & E. - W. C. - L. - J. - G. - B. C. D. All statements of facts, lists of tenders, do not necessarily require publication. We are compelled to decline pointing out books and giving addresses. Note - The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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The Publisher cannot be responsible for DRAWINGS, TESTS, MONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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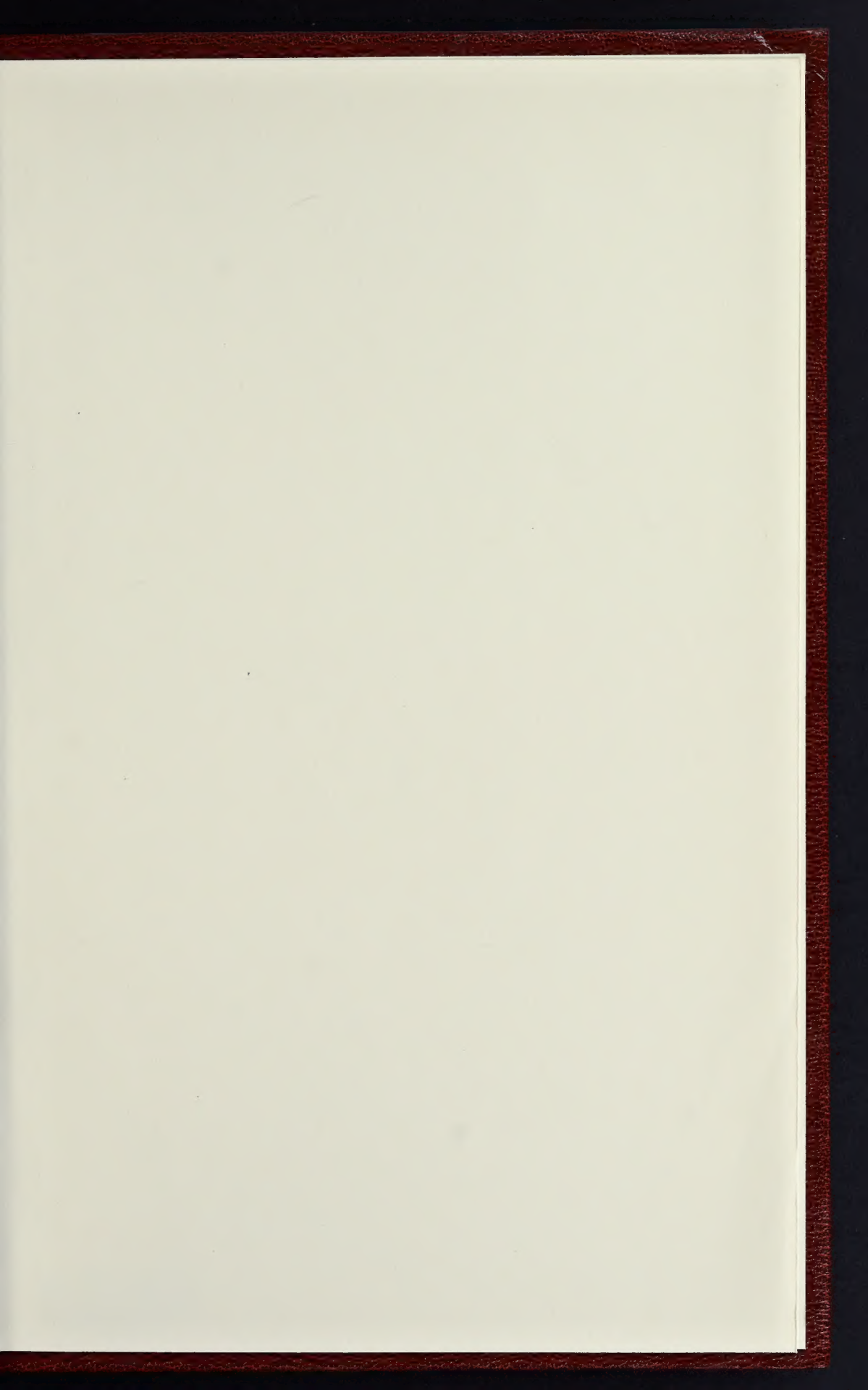
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